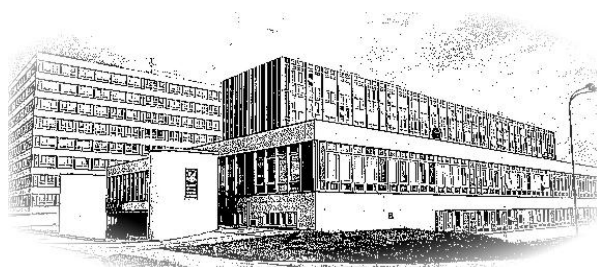


UNIVERSITY OF DEFENCE
FACULTY OF MILITARY HEALTH SCIENCES

ANNUAL REPORT

2010

HRADEC KRÁLOVÉ
CZECH REPUBLIC



**Faculty of Military Health Sciences
Hradec Králové**

EDITORIAL NOTES

Dear Reader:

This publication presents the main activities of the Faculty of Military Health Sciences Science of the University of Defence in Hradec Králové.

The 19th Annual Report includes the principal research and educational activities of the 9 departments, 1 institute and 1 centre so that it may act as a basis for internal and external evaluation respectively.

Should you require more detailed information about our Faculty, it is available on our website <http://www.pmfhk.cz> or <http://fvz.unob.cz>.

In case of any suggestions or comments to our activities, do not hesitate to contact us at the undermentioned address.

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CONTENTS

EDITORIAL NOTES	3
CONTENTS	5
FOREWORD.....	7
INTRODUCTION.....	9
• HISTORY	9
• THE MAIN AIMS OF THE FACULTY IN 2010	17
• THE STRUCTURE OF THE FMHS	22
THE DEAN OF THE FACULTY AND HIS DEPUTIES	23
• MEMBERS OF THE SCIENTIFIC COUNCIL.....	23
• MEMBERS OF THE ACADEMIC SENATE TILL 28 SEPTEMBER 2010.....	24
• MEMBERS OF THE ACADEMIC SENATE SINCE 29 SEPTEMBER 2010.....	24
• MEMBERS OF THE EDUCATION COMMISSION	25
CENTRE OF ADVANCED STUDIES	26
CENTRE OF INFORMATION TECHNOLOGIES	36
DEPARTMENT OF EPIDEMIOLOGY	38
DEPARTMENT OF FIELD INTERNAL MEDICINE	47
DEPARTMENT OF FIELD SURGERY.....	50
DEPARTMENT OF GENERAL AND EMERGENCY MEDICINE	54
DEPARTMENT OF MILITARY HEALTH SERVICE ORGANIZATION	57
DEPARTMENT OF MILITARY HYGIENE	59
DEPARTMENT OF PUBLIC HEALTH	63
DEPARTMENT OF RADIOBIOLOGY	65
DEPARTMENT OF TOXICOLOGY	69
INSTITUTE OF MOLECULAR PATHOLOGY	77
VIVARIUM.....	86
VISITORS TO THE FACULTY OF MILITARY HEALTH SCIENCES	89
VISITS ABROAD.....	89

COURSES, RESIDENCIES AT THE FACULTY IN 2010.....	99
INTERNATIONAL COOPERATION	102
SCIENTIFIC AND RESEARCH ACTIVITIES	107
THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE FACULTY OF MILITARY HEALTH SCIENCES IN 2010	111
ARTICLES IN JOURNALS WITH IMPACT FACTOR.....	123
ARTICLES IN OTHER JOURNALS	136
TEXTBOOKS, MONOGRAPHS, ARTICLES IN MONOGRAPHS AND PROCEEDINGS.....	145
ABSTRACTS IN JOURNALS WITH IMPACT FACTOR.....	150
ABSTRACTS.....	154
PRESENTATIONS AND POSTERS	168
RESEARCH REPORTS	217
INDEX	218

FOREWORD

The Faculty of Military Health Sciences in Hradec Kralove is a centre of medical education and research of the Army of the Czech Republic with long-time history. The military medical education began in Hradec Kralove in 1951 and we are celebrating 60th anniversary of the faculty in 2011. The school was established by an order of the President of the Republic as the Military Medical Academy, and later with a honorary nickname of "Jan Evangelista Purkyně". After the change of name to the Military Medical Research and Training Institute it is returned to its original name in 1988 and in 2004 during the professionalization of the army, reorganization of military education and University of Defense establishment it began a new phase, phase of the Faculty of Military Health Sciences. From 2004 our faculty is one of three faculties at University of Defence. Now the Faculty of Military Health Sciences belongs among key elements of military university education with the highest scientific output in the university. After merging with two other originally separate military universities we have created a viable and developing organism stressing strengths of its units. Each school covers variety of different tasks with limited staff and resources. Our role is not only to educate and train all the medical, pharmaceutical and nursing specialists and keep scientific excellence, but also general support of the Military Health Service which is influenced by various staff cuts and restructuring as well. The faculty primarily provides studies in two accredited bachelor's study (Military Health Care Management, Health Rescuer), three master's study programme (Military General Medicine, Military Dentistry, Military Pharmacy) and eight doctoral study programmes.

In spite of limited personal and financial resources in 2010, we would like to continue and even to increase most of our activities. The Czech (Medical Service) field hospitals are well-known around the world and there are not so many other good examples from our Military except military police and chemical troops. Our approach is different from the majority of other services. Our training is both long-term and intensive. It means that our students may gain deeper knowledge and skills and also an attitude to military life. From a short-term perspective, this model is more expensive; from a long-term perspective it may be more beneficial for the Army than contracting people from the civilian sector. Education, training and research should be jointed and a pool of excellent professors, scientists and teachers should be created. But it is a long way to go. The Faculty of Military Health Sciences is an open body for mutual cooperation with scientists and teachers from all democratic countries. In spite of changing priorities in the Czech Military, we are still dealing with specialization of the Czech Armed Forces in Nuclear, Biological and Chemical protection and many humanitarian and military deployments of military medical services abroad. Our Faculty will play the key role in this demanding process. We will guarantee the research

FOREWORD

and fulfillment of training needs for medical corps, specialized forces and for some NATO countries. Our very challenging goal is to build step-by-step the NATO centre of excellence for training and research in the field of NBC protection. Nevertheless our primary concern is education and training of students and young physicians. This is hardly to imagine without our closest partners and international cooperators and friends.

At present the Faculty covers the needs of troops concerning medical professional training in all specializations, medical informatics, science and research. The Faculty represents an optimal model of education for less populous medical specialties in close cooperation with Charles University in Hradec Kralove. The Faculty has educated a lot of specialists not only at a national, but also (at least) at European level. A lot of important positions prove it. These positions have been performed by the former and present faculty personnel in important international institutions from the NATO Surgeon General in Europe, through membership in various NATO, EU, United Nations Security Council, and World Health Organization boards, European Centre for Disease Prevention and Control, to the presidency in the World Medical Association that includes all doctors all over the world. The Faculty provides and solves a lot of research projects, it has its own complex laboratory technologies for scientific work, above all within the sphere of life force protection against NBC agents. The scientific results are published in many respected international journals. In 2010, we reached one of the best scientific results in the history.

The very fact that the Faculty has survived all the reform, reorganization and other changes, demonstrates its uniqueness, high educational, professional and research level. That could not be achieved without close cooperation with other scientific and educational work. Not at all the universities are seen as closely collegial relationship as we have with Medical and Pharmaceutical Faculties of Charles University, University of Hradec Králové, Faculty of Health Studies in Pardubice, Faculty Hospital in Hradec Králové and military field hospital base. Personally, I perceive as a higher cooperation with representatives of the city of Hradec Kralove, thanks to which the Faculty has an excellent name among the city public. All this adds a spiritual dimension to the Archbishop of Prague favor of our Faculty. I am pleased that this collaboration will be able to continue.

Dean of the Faculty of Military Health Sciences
COL Assoc. Prof. Roman Chlíbek, M.D., Ph.D.

INTRODUCTION

HISTORY

The Purkyně Military Medical Academy has been a long-term educational and scientific centre of the Czech Army Medical Service. There has been a very long history of systematic education of military medical personnel in our country. Its beginnings lie, as in many European countries, in the 18th century. Large, permanent armies were being built and the military medical service became a normal part of these armies. In 1776 the War Council of the Vienna Court issued an administrative order which definitely prohibited the employment of field surgeons in the armed forces who had not studied anatomy and who had not had their knowledge officially examined. This can be considered the beginning of organized education of military medical personnel in our country. Six-month courses were organized for field surgeons at the Garrison Hospital in Gumpendorf near Vienna.

The fundamental milestone in the “Austrian” stage was, however, in 1785 with the establishment of the Military Medical (Surgical) Academy named the Josephinum after its founder, the enlightened monarch and father of many political and social reforms, Emperor Joseph II. He saw the mission of the school as fulfilling these tasks:

- education of qualified military surgeons (physicians)
- creation of a learned society for research in medical science
- creation of a permanent field sanitary commission for solving questions concerning combat casualty care.

A number of renowned physicians of Czech origin significantly contributed to nearly 90 years of the school’s history.

The foundation of the independent Czechoslovak Republic in 1918 meant at the same time the creation of a democratic army. The basic element of career military physician training was represented by the Military Medical School. Its establishment was the result of a decision by the Czechoslovak Republic government which by its resolution of 25 June 1926 defined the principles of recruiting professional medical and pharmaceutical personnel to the army. The Military Medical School provided professional training for military physicians and further qualification growth for the performance of higher command functions in the military medical service structure.

The development of the Czechoslovak Military Medical Service in our country was interrupted by the Second World War. When the army was disbanded a number of physicians and medical students participated in foreign and domestic resistance. The largest number of them were concentrated in England. The British government permitted medical students to complete their studies at British universities. They graduated from Oxford

HISTORY

University. The Czechoslovak Military Hospital was created at London Hammersmith Hospital. A few courses of the Medical and Pharmaceutical Reserve Officer School were taught in Leamington and Walton-on-the-Naze where the Czechoslovak Brigade's out-patients' department was situated. Thus, the tradition of the Czechoslovak military medical educational system maintained its continuity.

In 1945 the pre-war practice of recruiting professional personnel to the Military Medical Service was rebuilt. The Military Medical School in Prague was renowned. At the same time tendencies referring to the practice of some medical services of the world's leading armies which required the establishment of an independent military medical university were increasing. The results of the Second World War and the growth of new knowledge in the field of medicine and especially military medicine played a significant role in this.

In 1951 a new period began in the development of the Czechoslovak military medical educational system. This period has been permanently connected with Hradec Králové for 55 years. Rapid establishment of the Military Medical Academy (MMA) was possible only due to the fact that it was built on the basis of being a theoretical and clinical part of the Faculty of Medicine – a branch of Charles University established in 1945. Thanks to the reputation of its workers, a majority of whom became employees of the MMA, the school became an educational and scientific centre of the Czechoslovak Medical Service and within a short time gained a good reputation both at home and abroad. The MMA has educated a number of outstanding military medical specialists and the first steps of several contemporary top specialists of Czechoslovak medicine were connected with its existence.

Beginning in 1958 and for the next 30 years the military medical system was transformed into the form of the Purkyně Military Medical Research and Postgraduate Institute. Research tasks and activities in the area of further schooling and specialization of military physicians and pharmacists became a fundamental part of its activity. The main portion of a further basic task of the school – the pregraduate training of future military physicians – was taken over by the renewed Faculty of Medicine of Charles University in Hradec Králové. The development of mutual cooperation between these two partner schools, to which the Faculty of Pharmacy of Charles University in Hradec Králové joined in 1976 as a significant guarantee of the education of military pharmacists, has become a part of the military medical system.

In 1988 the school changed its name to the Purkyně Military Medical Academy which, institutionally, reflects more precisely the wide variety of its activities.

In November 1989, the school entered a qualitatively new period of development. It has passed through a transformation which has basically changed some military-professional teaching programmes, the organizational

structure of the school, personnel support, the composition of the educational staff and so on.

The Academy has been included in the new university educational system and since 1993 (origin of the Czech Republic) has served as a training centre for Czech Army medical professionals. It has trained nearly 2600 military surgeons, dentists, and pharmacists till now.

Some special activities have become a main part of the school's activities. The humanitarian role of the Military Medical Service and the Military Medical Academy personnel in the present foci of conflicts in the world without doubt rank among them. As early as 1991 an independent Czechoslovak NBC battalion was sent to the Gulf. In 1994 a further tradition was established – regular operation of military medical personnel in peace-keeping missions in the territory of the former Yugoslavia. The 6th Field Hospital is known to the public for its operations abroad, first in the former Yugoslavia and later in Albania, and then in Turkey following the earthquake in that country. In 2002 members of the Czech Army Military Medical Service were employed in the ISAF mission in Afghanistan. From May to October it was the 6th Field Hospital. Then this mission was taken over by the 11th Field Hospital which completed its operations at the end of 2002. Professional training and personal acquaintance of both field hospitals personnel before their departure abroad has been traditionally carried out at the Purkyně Military Medical Academy.

Some employees of the Purkyně Military Medical Academy are representatives at international non-governmental institutions and in the positions of UN and NATO experts and advisers. The highest position within the NATO Allied Command Europe Medical Service was held by Brigadier-General Assoc. Prof. Leo Klein, M.D., CSc. He remained in this position until September 2002 when he completed his period of service. Since December 2002 he has been Surgeon General of the Czech Army Medical Service. He is known to the public for his work at the Department of Field Surgery at the Purkyně Military Medical Academy and at the Surgical Department of the Teaching Hospital in Hradec Králové.

COL Assoc. Prof. Roman Prymula, M.D., CSc., Ph.D. has been elected the new Rector of the Purkyně Military Medical Academy. He officially assumed this position on October 1, 2002.

The Academy continues to be a centre for integrated education and scientific research activity ensuring educational and research activities of all kinds and degrees for the training of military medical professionals. In the future its aim is to remain a modern university institution fully comparable with similar facilities and standards in other NATO countries.

The year 2003 was significant with regard to different opinions on the reform of the Czech Republic Armed Forces. The initially proposed conception was reevaluated in the wake of the reform of public finances which was enforced by the Government. Therefore financial sources were

HISTORY

redistributed and reduced. There were new efforts to establish an economic army structure. The Czech Republic Government Resolution no. 1154 of 12 November 2003 entitled "The Conception of the Professional Czech Republic Army Development and Mobilization of the Czech Republic Armed Forces Modified According to Financial Sources" has become the final document respecting NATO general interests.

Academy life was significantly affected by the mission of the Czech Republic Army 7th Field Hospital to Iraq. (The hospital followed with activities of the Czech Chemical Protection Contingent in Kuwait). Transport of soldiers and material began on 18 April 2003. Basra, in southern Iraq, was appointed the final destination. In September 2003 a personnel rotation was carried out and the hospital finished its activities in December 2003. Our Academy significantly supported the deployment of the 7th Field Hospital through its personnel, organizational activities, professional education and training.

One of the most important preconditions of transformation of the Czech Republic Army to the fully professional system, is a reorganization of military school system. In the year 2004, merital changes were done in this area. On the basis of amalgamation of the Military School of Ground Forces in Vyškov, the Military Academy in Brno and the Purkyně Military Medical Academy in Hradec Králové there was established the University of Defence in Brno. It comprises three faculties – the Faculty of Military Technology, the Faculty of Economics and Management, the Faculty of Military Health Sciences and three independent university institutes. Act No.214/2004 of the Code makes up the legal framework of a new legal subject which at the same time identified the date of establishing the University of Defence on 1 September 2004. Brig Gen Assoc. Prof. Ing. František Vojkovský, CSc. became the Rector of the University of Defence. The University of Defence was officially opened with a solemn inauguration on 8 October 2004.

After the transformation of the Purkyně Military Medical Faculty into the Faculty of Military Health Sciences (seated still in Hradec Králové), the basic functions and tasks of the school focused on a specialized training of the Czech Army medical officers and on research work in the area of military health service have been saved. However, number of school employees was cut down.

A new official name of our school is: University of Defence, Faculty of Military Health Sciences in Hradec Králové. A new dean of our school became the former rector of school COL Assoc. Prof. Roman Prymula, M.D., CSc., Ph.D., on the basis of new academic bodies' voting.

In the year 2004, Czech Republic Army officers carried out their assignments of different forms in peacekeeping missions in Iraq, Afghanistan and the Balkans. Members of our school were not missing. Specialists of the Department of Field Surgery played there a principal role. In the frame of joint operation of multinational forces in Iraq (MNF – Multinational Forces

Iraq) they fulfilled their tasks at special work places in British military hospital. Their assistance was highly and positively assessed.

During 2005 the process of establishing the new university subject – the University of Defence continued with solving the seat and the position of the Faculty of Military Health Sciences. The Faculty of Military Health Sciences received an important position in the supreme self-governing body of the university by electing COL Assoc. Prof. Jiří Kassa, M.D., CSc. as the Head of the Academic Senate of the University of Defence on 6 October 2005. He works as the Head of the Department of Toxicology and he is a chief specialist of the Czech Republic Army Surgeon General for toxicology.

The year 2006 was a jubilee year. The staff of the Faculty of Military Health Sciences of the University of Defence commemorated the 55th anniversary of the military medical school system in Hradec Králové and its eighty-year existence in the Czech Republic. This school is an irreplaceable centre of training and education of military health care professionals of all branches for the Army of the Czech Republic. The Faculty of Military Health Sciences of the University of Defence guarantees a good quality of the solved research tasks for the benefit of the military health service. High level of the scientific and research activity facilitated the establishment of scientific cooperation with NATO and EU partners.

The extent of school activities is very wide. The clinical departments provide the general public with the health care including special therapeutic activities. Military health care experts are involved in the integrated emergency system. The preparation of personnel for humanitarian and peacekeeping missions is implemented here. The school provides medical information service, experts reports and language teaching for the Army of the Czech Republic.

More information about the history and the present state of the military medical school system and the Faculty of Military Health Sciences of University of Defence is to be found in the publication „Military medical school system“, edition: Ministry of Defence, Avis, Prague 2006.

In 2007, intensive activity was typical for all aspects of school life. Let's recall the most important: The Faculty of Military Health Sciences University of Defence participated in the preparation of Czech field hospital contingents (so far three of them have been sent out), which ensure the health support of ISAF mission in the region of Kabul in Afghanistan. Some medical specialists of the Faculty were directly fulfilling the mission assignments as members of the contingent: MAJ Michal Plodr, M.D., Ph.D. worked as head doctor of the hospital, MAJ Ivo Žvák, M.D. as head doctor of operating theatres, and MAJ. Jan Psutka, M.D. worked at the department of contemporary hospitalization. The main task of the field hospital is to provide professional health care for the wounded and sick during outside combat activities, as well as for their short-time hospitalization.

HISTORY

The public show of scientific and research results is traditionally an important part of school activities. The climax was the 7th Conference of the Association of Military Doctors, Pharmacists and Veterinary Doctors of the Czech Medical Society of Jan Evangelista Purkyně in October, and the 4th Conference Disaster Medicine and Traumatological Planning in November 2007. This year's novelty was a competition for the best scientific student's work in doctoral study programmes. The cooperation with foreign school and scientific partner institutions went on. In this context, the November visit from the Military Medical Academy Lyon, led by its new commander General Maurice Vergos, was a remarkable event.

At the end of the year, an important event in school organization happened: 10th December, COL Prof. Roman Prymula, M.D., Ph.D., was inaugurated Dean of the Faculty of Military Health Sciences. His clear election to the leading function is not only appreciation of his personal, managerial and professional qualities (it belongs to his triumph in March – obtaining the professorial diploma), but also of the stability and continuity of the place and role of the Faculty of Military Health Sciences.

Significant features of the activity of the Faculty of Military Health Sciences, University of Defence, were in the year 2008 the public acknowledgements which were attributed to the Faculty eminent research specialists. Already in February, Assoc. Prof. Jiří Bajgar, M.D., D.Sc. was awarded the Prize of the Rector of the University of Defence for his research work in 2007. The Scientific Council thus appreciated his extraordinarily large publishing and lecture activities, besides un-disregardable appraisalment Assoc. Prof. Bajgar gained from the American Society of Toxicology, being awarded the prestige Astra Zeneca Award. The prize winner significantly contributed to clarification of the toxic effect mechanism of organo-phosphorous compounds and to the development of new prophylactic and therapeutic means against highly toxic nerve paralytic substances.

In May, the above mentioned feature of the activity of the Faculty of Military Health Sciences, University of Defence converted into a handover of two letters of appointment of new Czech Universities professors to two eminent workers of the Faculty. In renowned Prague Carolinum, the letters were accepted from the hands of the President of the Republic by LTC Assoc. Prof. Jan Österreicher, M.D., Ph.D. and Assoc. Prof. Jiří Stulík, M.D., Ph.D.

The Faculty workers confirmed repeatedly their both research and organizing capabilities. They became the organizers of many traditional presentations of scientific work. Large community of epidemiologists gathered at the end of May among others to worship the memory of the nestor and military specialist in the field of epidemiology, Professor Bohumil Ticháček, M.D., D.Sc. (1924–2006) by their active participation at a conference “Ticháček's Days of Military Epidemiologists”. Similarly, in September the Faculty substantially participated in organizing the whole Republic Conference 4th Hradec Vaccinologists Days.

A number of talents has been revealed by presentation of students' research work. Periodic Faculty round of research conference of students, who work mostly as scientific and teaching staff at the Faculty Departments, took place at the end of September. CW2 Veronika Mikusová and CW2 Pavel Novotný obtained this year's primacy. The postgraduate programme students presented their research results immediately afterwards. Works of authors CPT Karel Šmejkal, M.D., a student of postgraduate programme Military Surgery and LT Jiří Dresler, Doctor of Pharmacy, a student of postgraduate programme Molecular Pathology, were awarded the best.

The international cooperation of military medical schools has been among the traditional active forms of the school work. The visit of the delegation of the leadership of partnership school École du Service de Santé des Armées from Lyon, guided by GEN Francis Huet, School Deputy Commander, confirmed the trend of continuous cooperation.

At last but not least, the conference of the Association of Military Doctors, Pharmacists and Veterinary Doctors of the Czech Medical Society of Jan Evangelista Purkyně has become repeatedly much appraised specialist forums. This year's 8th Conference content concerned mostly Disaster Medicine, Traumatology Planning and Training.

The date of the Conference, the last days of November, seemed to conclude symbolically the year of noticeable presentation and at the same time extraordinary acknowledgements of the Faculty research results.

CPT. Zdeněk Šubrt, M.D., Ph.D from the Department of Field Surgery, a graduate of doctoral study programme Military Surgery, was awarded the Prize of the Mayor of the Town Hradec Králové for students' research work in 2009.

Prof. Aleš Macela, D.Sc. was awarded the Prize of the Rector of the University of Defence for scientific research in 2008, especially for excellent results in solving scientific projects in the sphere of protection against effects of extra dangerous biological agents.

In September 2009 the present Dean of the Faculty COL. Prof. Roman Prymula, M.D., PhD. became on the basis of selection procedure a director of the University Hospital in Hradec Králové. The Academic Senate elected LTC Assoc. Prof. Roman Chlíbek, M.D., Ph.D a new Dean of the Faculty. The Rector of the University of Defence appointed him as dean on 15th October 2009.

In the year 2010, Prof Prymula was awarded as the first author of one of the best Elsevier's publications in 2009 for the article: Prymula R, Siegrist CA, Chlíbek R, Zemlickova H, Vackova M, Smetana J, Lommel P, Kaliskova E, Borys D, Schuerman L.: Effect of prophylactic paracetamol administration at time of vaccination on febrile reactions and antibody responses in children: two open-label, randomised controlled trials. *Lancet*. 2009, 374 (9698):1339-50. Extraordinary high quality of this publication was also confirmed by many

HISTORY

other awards during the year 2010: 2009 Kredb's Award for original scientific work and the best publication from the Czech Medical Association of J. E. Purkyne, 2010 prof. Karel Raska's Award for the best scientific article published during 2009.

THE MAIN AIMS OF THE FACULTY IN 2010

The Faculty of Military Health Sciences (FMHS) of the University of Defence in Hradec Králové is a centre of medical education, training and research of the Army of the Czech Republic. It entirely covers the needs of the troops concerning medical professional training in all specializations, medical informatics, science and research.

1. Education

The main aims of the FMHS in the field of education were as follows:

- to provide university-level studies in the subjects of military general medicine (6 years), stomatology, pharmacy (5 years), administration and management study, medical rescue (3 years)
- to provide postgraduate study for Ph.D. degree (4 years) in accredited disciplines:

Epidemiology	Military Hygiene
Field Internal Medicine	Military Radiobiology
Field Surgery	Molecular Pathology
Infectious Biology	Toxicology

According to the needs of the Surgeon General of the Czech Armed Forces and the Military Medical Service Administration, the Faculty ensures specialized and lifelong education of doctors, pharmacists and other military medical service personnel in specified branches of the Act No. 95/2004 of the Code about conditions of receiving professional qualification and specialized qualification to do a medical profession as a doctor, a stomatologist, and a pharmacist. It unifies the system of their training with requirements of EU.

The faculty organizes and provides the training for medical personnel in active service, doctors, nurses and other medical personnel. The faculty provides professional refresher courses for medical staff, non-medical staff and non-medical personnel of field medical units- hospital base and its units in selected up-to-date topics. It takes part in continued training of doctors and health care personnel, who are sent to missions abroad as well. Unique military know-how is attractive for people, who work out of the military health care sphere. The FMHS provides courses of advanced first aid in the field not only for Military Medical Service personnel but also for professional non-medical personnel of Military Police units, reconnaissance and special units

THE MAIN AIMS OF THE FACULTY IN 2010

within the frame of the Czech Armed Forces, Rapid Reaction Units of the Czech Republic Police and the others.

All soldiers assigned to include into foreign missions take part in extra courses of advanced first aid. Training of emergency life support in field conditions is required in medical personnel. The courses BATLS / BARTS (Battlefield Advanced Trauma Life Support) and BARTS (Battlefield Advanced Resuscitation Techniques and Skills) for doctors and nurses or health care personnel are enlarged on the problems of NBC protection and they become a significant standard not only for the whole medical service, but also for a lot of other specialists, who take part in foreign missions.

Other courses concentrate on teaching and training of comprehensive knowledge necessary for providing medical care within the frame of Disaster Medicine. The FMHS also provides 71 other teaching and training activities determined by „The Plan of Courses and Professional Residencies Training of the Czech Armed Forces Medical Service“ and „Notification of Director of Personal Section of the Ministry of Defence – Teaching Activities at Military schools and Training Facilities in the Czech Republic and Abroad“. It participates in medical personnel training of medical and non-medical specializations under the methodical and professional leadership, in providing instructors for training of higher categories of medical personnel and in teaching instructors of lower medical specialists training.

2. Scientific and research work

The FMHS of the University of Defence provides and solves research tasks for the Czech Armed Forces Medical Service. It managed to set up scientific teams which are able to use advanced laboratory technologies. It has its own complex laboratory technologies for scientific work above all within the sphere of life force protection against NBC agents. The high scientific level and the achieved results in scientific and research activities of present teams have enabled to start scientific cooperation with foreign partners. The FMHS is the only one in the Czech Republic who provides military research within the sphere of CBRNE issues in NATO and EU.

The high level of the present teams has enabled to start scientific cooperation with partners in NATO countries, which is financed by the NATO and EU funds. Within the sphere of the science and research, the FMHS fulfilled strategic purposes of the Czech Armed Forces transformation by targeting the enunciated priorities (biological agents, chemical agents, military health care), furthermore it reached joining the appropriate institutions and organizational structures of NATO and EU countries (including drawing financial NATO and EU funds) and it gained some priority results in enunciated areas. From the point of view of specialization and direction of the Czech Armed Forces, the departments of the FMHS solve medical issues of biological, chemical and radiation protection. Previous as well as contemporary scientific production within the sphere of observation of

medical aspects of NBC agents affection is the subject „Centre of Advanced Studies“ with CBRNE protection issues in the Army of the Czech Republic. It fully corresponds with set priorities in the field of scientific and research work of the Army of the Czech Republic. The military medical service organization and management, information systems, research activities of clinical and therapeutic preventive branches are the other important fields of scientific work.

A lot of invitations and speeches at international symposia and conferences as well as a great number of publications prove that scientific knowledge is used in education. The FMHS personnel can publish achieved results in research work, therapeutic preventive activities and in educational activities in the journal "Vojenské zdravotnické listy" (Military Medical Journal), which is the oldest military specialized journal which has been being published since 1927. Together with professional scientific and pedagogical activities there are also results in lecture and publication areas. They are a part of evaluation, which is carried out annually. The faculty is successful in keeping a good level of publication activities in impact factor journals and in other national and foreign journals with review proceedings. This fact enables relatively wide training activities in accredited doctoral study programmes.

Nowadays (Year 2010) the Faculty participates in 19 projects of defence research, 5 projects of Internal Grant Agency of the Ministry of Health, 5 project of the Ministry of Education, 5 projects of the Grant Agency of the Czech Republic, 6 foreign projects (NATO, EC). The total sum of research grants represents the amount of 61 mil. Czech Crowns (approximately 3 500 000 USD). The accreditation award for the Vivarium in the field of biological and medical science is an important step to realize a lot of research and experimental work on laboratory animals.

Scientific, research and development activities in the field of medical support include prevention, diagnosis and treatment of sick and wounded. An integral part of this work is to improve the system of medical equipment administration and supply support.

Research and development is carried out at 9 departments (Epidemiology, Field Internal Medicine, Field Surgery, General and Emergency Medicine, Military Hygiene, Military Medical Service Organization, Public Health, Radiobiology, Toxicology) and in the Institute of Molecular Pathology, and the Centre of Advanced Studies.

In 2010, scientific work at the faculty departments, the institute and the centre was focused on CBRNE protection research, prevention in hygiene and epidemiology, topical problems of field surgery and field internal medicine, topical problems of organization, management, education and information science in the Military Medical Service.

The received accreditation for proceedings to promote a professorship for the branches of Hygiene, Occupational Medicine, Epidemiology, Toxicology,

THE MAIN AIMS OF THE FACULTY IN 2010

Field Internal Medicine and Molecular Pathology and the accreditation for habilitation (associate professor) in the branches of Hygiene, Occupational Medicine and Epidemiology, Toxicology, Field Surgery, Military Radiobiology, Field Internal Medicine and Molecular Pathology gives the evidence about the excellent level of achieved results in scientific and research activities of FMHS. In 2010, there were 10 professors (prof.), 13 associate professors (doc.), 3 doctors of science (DrSc.), 56 persons with research degrees (CSc., Ph.D.) who carried out teaching and research tasks.

3. Therapeutic activities

Special therapeutic activities were provided especially at the departments of Field Internal Medicine, Field Surgery and General and Emergency Medicine. Close cooperation between these subjects and the health service establishments in the region were more and more developed. Therapeutic activities were provided, especially in the field of hematologic intensive care, traumatology, hepatobiliary surgery, and at the plastic surgery departments of internal medicine and surgery, at the Teaching Hospital. In the field of general and emergency medicine there were ongoing therapeutic activities within the framework of the Garrison Medical Centre and Emergency Medical Department.

4. International cooperation

The main aims of international cooperation of the FMHS were to exchange scientific, educational and therapeutic information and to develop working contacts between military medical, medical educational and research institutions of the NATO and EU countries as well as civilian medical institutions with educational, defence research and development programmes. Residency and exchange programmes for numerous students, doctors and research workers took place at those institutions.

As for study programmes, the Faculty keeps close relations with partner educational institutions above all in NATO and EU countries. Every year there are exchanges of not only students but also of pedagogical staff with the Military Medical Academy (ESSA) in Lyons in France, contacts in pedagogical sphere are kept with partner schools in Germany (Sanitätsakademie der Bundeswehr, Munich), the Military Medical Academy in Sofia, Bulgaria. In the past there were contacts with schools in Łódź (Poland) and Beograd (Serbia).

5. Expert activities

The membership in work groups for coordination and cooperation of military medical research and professional training at NATO (COMEDS,

BIOMEDAC, RTA/RTO) and at EDA (European Defence Agency), in work groups of government experts for the Convention on the prohibition of biological, bacteriological, and chemical weapons and their destruction in Geneva and UNO, organizing scientific conferences with international participation, and solving foreign research projects under the cooperation of the FMHS personnel are very important for presentation of international cooperation results. At the FMHS there are conditions for foreign cooperation in medical research. The priority still remains in cooperation in the frame of the Human Factors Medicine of the NATO Research and Technology Organization and its work groups (TG, WG), cooperation in research projects with other foreign scientific institutions and participation in projects of 7th EU General Programme. Our aim is to intensify international cooperation in NATO focused on scientific support of the armed forces structure.

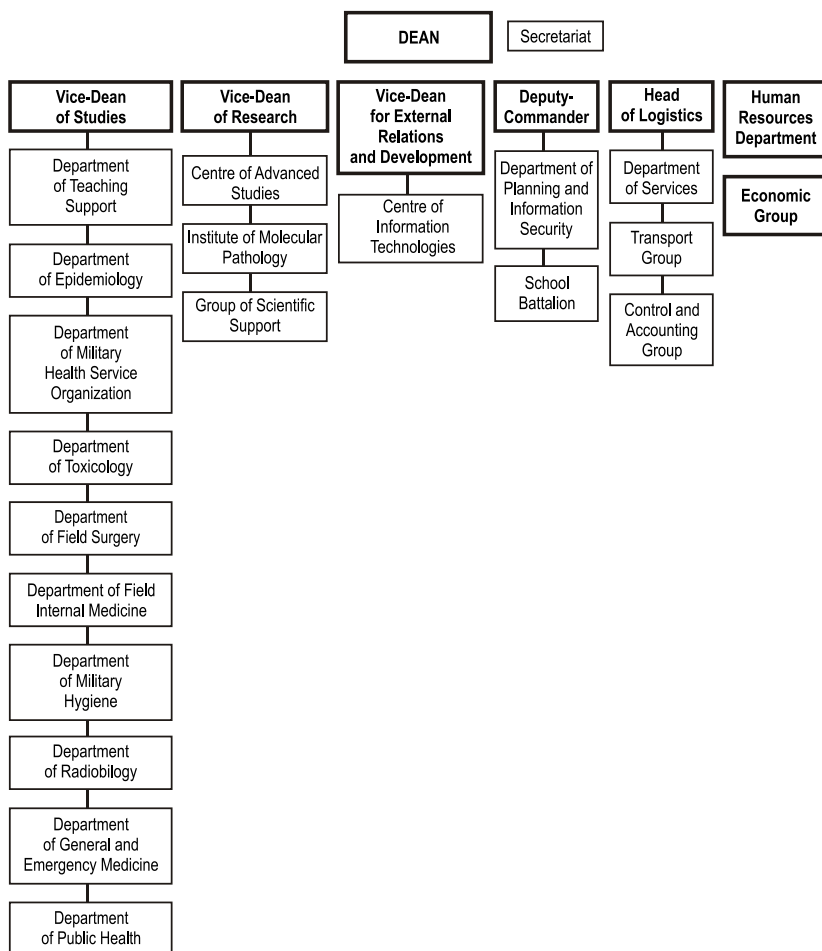
6. Scientific and educational information services

Scientific and educational information services that support the whole Medical Service of the Czech Republic Army were provided by the Centre of Information Technologies. Numerous literature retrievals, courses, library and printing workshops and other information services support for students, teachers, scientists, postgraduates, doctors, nurses and other medical experts were carried out.

7. Foreign missions

The FMHS performed the preparation of health personnel for humanitarian and peacekeeping missions as in the preceding years. In 2010 five FMHS members took part in the foreign missions.

THE STRUCTURE OF THE FMHS



**THE DEAN OF THE FACULTY AND HIS DEPUTIES
MEMBERS OF THE SCIENTIFIC COUNCIL**

**THE DEAN OF THE FACULTY
AND HIS DEPUTIES**

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PELLANT Arnošt	PRYMULA Roman
RYŠKA Aleš	SLABÝ Antonín
STULÍK Jiří	ŠPLÍNO Miroslav
VÁVROVÁ Jiřina	

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BARNIŠIN Lukáš	CABAL Jiří
DOBEŠ Daniel	HÁNA Luděk
HLÚBIK Pavol	CHRÁSKOVÁ Dominika
KONŠTACKÝ Stanislav (Vice-chairman)	PEJCHAL Jaroslav
PRACHAŘOVÁ Šárka (Vice-chairman)	PSUTKA Jan (Head of the senate)
PUDÍK Peter	RUDISCH Filip
SMETANA Jan	VÁVROVÁ Jiřina
VOSEČKOVÁ Alena	

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Centre of Advanced Studies is an integral part of Faculty of Military Health Sciences of University of Defence, Czech Republic. The main task of the Centre is the transfer, utilization, and dissemination of advanced technologies for biomedical defence research supported by Ministry of Defence of Czech Republic. The biological labs of BSL2 and BSL3 category and chemical lab for the analyses of highly toxic chemicals were activated during the first year of its existence. The team of the Centre adopted and provided an access to new technologies. Among them are technologies for histochemistry, immunohistochemistry, laser microdissection, fluorescence microscopy, proteomic technologies including isolation and proteomic

analysis of total membrane proteins and lipid-raft associated proteins, genomic technologies oriented to qRT-PCR applications, mutagenesis of *Francisella tularensis* by allelic replacement, gene reporter assays, technologies for the qualitative and quantitative analyses of antidotes and chemical warfare agents in biological samples using different HPLC techniques, methods for determination of oxidative stress, construction of biosensors, preparation of quaternary and non-quaternary inhibitors of enzyme acetyl cholinesterase, random chemistry approaches in the development of acetyl cholinesterase inhibitors, technology of artificial neural networks and molecular modeling for prediction of new bioactive compounds, and finally microbiological technologies needed for screening of functional properties of bacterial mutants (proliferation assays and protective tests).

CBRN programmes in 2009 follow the long-lasting research strategy of the Centre. B-agent programme involves several topics aimed at management of biological crises, modelling & risk assessment, (immuno)prophylaxis of infections, immunopathogenesis of viral diseases and, finally, the genetics of biological agents oriented to *Francisella tularensis*. C-agent programme is focused on development of new prophylactic and therapeutic antidotes and toxic agent scavengers utilizing the methodology of 3D in silico modelling and simulation of bio-molecular three- and fourdimensional structures and inter-molecular interactions. RN-agent programme encompassing the problems of molecular markers of ionizing radiation injury is divided into biodosimetry and diagnosis and therapy of ionizing irradiation syndromes.

New international contacts have been established with several European and US military and civilian research institutions. Moreover, the broad-based collaboration under the umbrella of European Defence Agency started to be the indispensable tool for reinforcement of scientific collaboration inside the European Union. Collaboration with partners is supported by two-side or multilateral projects. During short time of its existence the Centre of Advanced Studies thus achieves all attributes of fully consolidated scientific centre collaborating with substantial number of prominent European scientific institutions.

RESEARCH PROJECTS

BIODEFENCE – Classification of biological agents – support of an international project „Establishment and management of a common database of B-agents – A European Laboratory Biodefence Network

Hubálek, M., Kubelková, K., Macela, A., Hernychová, L.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200901)

The goal of the project is to gather typing data for B-agents listed in project of the european biological database by the mean of mass spectrometry (MALDI-TOF, tandem mass spectrometry) and molecular biology (real-time PCR, MLST).

Catalytic bioscavengers of neurotoxic organophosphates: Optimization AND functionalization

Nachon, F., Jun, D.

Supported by Plan de coopération franco-tchèque and General Direction for Ordnance, 2008–2011 (Project No.: 16A03-FR20/08co501)

The aim of the project is the development of catalytic bioscavengers of toxic organophosphates (e. g. nerve agents and pesticides) based on chemically modified enzymes and evaluation of protective, pharmacokinetic and immunologic properties of prepared bioscavengers by in vitro and in vivo methods.

Development of new anti-tularemia vaccine on the basis of elucidation of molecular mechanism of tularemia pathogenesis

Stulík, J., Hubálek, M., Strašková, A., Macela, A., Červený, L., Kročová, Z.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2011 (Project No.: NS9747)

Project is focused on elucidation of tularemia pathogenesis using techniques of proteomics, genomics, molecular biology, immunology and microbiology. The main goal is to find genes encoding factors of virulence and based on this knowledge to create new prophylactic tools.

Development of novel antidotal treatment against organophosphorus pesticides

Musílek, K., Kuča, K., Pohanka, M., Žďárová Karasová, J., Marek, J.

Supported by the Ministry of Education, Youth and Sports, 2009–2012 (Project No.: ME09086)

The development of the broad-spectrum acetylcholinesterase reactivator against organophosphorus pesticides (OPP) is the main aim of the whole project. The synthesis and in vitro evaluation of novel or formerly prepared compounds will be used for this purpose. The structure-activity studies will be figured out for its determination. Such reactivator will be further tested in vivo and might become a candidate for the preclinical trials against OPP.

FARMAKO – Determination of important pharmacokinetic and biochemical parameters and evaluation of blood-brain barrier penetration using drugs introduced to Czech Army

Žďárová Karasová, J., Pohanka, M., Novotný, L., Kuča, K.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200811)

The aim of this project is to characterize pharmacokinetics of substances using in therapy by intoxications. Mainly their distribution in body tissues, in vitro and in vivo testing of ability to penetrate into central nervous system and their possibility to injury brain. At the same time we will evaluate some important biochemical data, which can be influenced by this therapy.

FRANCIS – Development of new prophylactic tools against Francisella tularensis infection

Stulík, J., Dresler, J., Härtlová, A., Filip, D., Lenčo, J., Link, M., Klimentová, J., Kročová, Z., Červený, L., Hubálek, M.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200808)

Identification of new candidate molecules of protein origin suitable for the construction of better defined live or subunit vaccines and elucidation of the process of antigen presentation of tularemic peptides as a key event for the development of new strategies to treat and prevent infection with Francisella tularensis.

HOREČKA – Method of viral hemorrhagic fevers' causative agents rapid detection and identification

Fajfr, M., Červený, L., Růžek, D.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUVZU2008002)

The main aim of our research project is design and optimisation of new rapid viral hemorrhagic fevers' (VHF) detection and identification system targeting main causative pathogens. The system will be based on two steps: primary rapid detection and identification of viral family using Real-time reverse-transcription polymerase chain reaction (RT-PCR) and secondary pointed use of the same method for causative pathogen precise species determination. Output of this project will be concept of new rapid economic VHF diagnostic technique, fitting its detection limits, difficulty and material requirements of Czech army biological defense forces.

INDIKÁTOR II – Reverse detection of received ionizing radiation dose by monitoring of cell population changes using biophysical methods

Šinkorová, Z., Tóthová, I., Pejchal, J., Zárybnická, L., Kročová, Z., Österreicher, J.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200809)

To establish extrapolated calibration curve for determination the received dose in individuals exposed to ionizing radiation which could be practical

used in the Czech army and to design the best enlistment of this biophysical method into the therapeutic-transfer system of the Czech army.

INHIBITOR – Novel inhibitors of acetylcholinesterase as prophylaxis of nerve agent poisonings

Musílek, K., Žďárová Karasová, J., Pohanka, M.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200805)

This project is focused on finding of suitable reversible acetylcholinesterase inhibitor as a replacement of prophylactic drug pyridostigmine. For this purpose, 100 reversible AChE inhibitors will be prepared, evaluated in vitro and compared with prophylactic drugs used in the Army of the Czech Republic. Regarding the structure-activity relationship, the best reversible AChE inhibitor will be determined and recommended for in vivo evaluation.

Molecular mechanisms of CD4+ T cell dysfunction in SIV

Bošík, P.

Supported by National Institutes of Health, 2006–2010 (Project No.: R01AI065362-02)

While SIV infected Asian macaque monkeys develop disease very similar to humans infected with HIV, SIV infected African mangabey monkeys do not develop disease. Defining the mechanisms that distinguish disease susceptibility and resistance is the goal of our studies. Loss of CD4+ T cells accompanied by loss of appropriate CD4+ T cell function is the hallmark of pathogenic HIV-1 infection and SIV infection of select Asian species of nonhuman primates (NHP), such as rhesus macaques (RM). However, some NHP species, such as sooty mangabeys (SM) that are natural hosts of SIV, do not experience similar CD4+ T cell dysfunction and do not develop disease despite relatively high viral loads that are comparable to those present in SIV infected rhesus macaques that develop AIDS like disease. The precise mechanism(s) that lead to such loss of CD4+ T cells function has yet to be defined, but one of these mechanisms is a development of massive susceptibility of the both infected and non-infected – "bystander"-CD4+ T cells – to undergo immune mediated SIV induced dysfunction leading to the decrease in T cell responses, while, at the same time lymphocytes from SIV infected SM do not show similar CD4+ T cell- to dysfunction and maintain proper T cell responses. Proposed studies address in a stepwise fashion the potential effects that SIV may exhibit on each stage of the signal transduction machinery from the engagement of the receptor on cell surface down to the epigenetic regulation of transcription of critical effector genes at the promoter level. The approach of the utilization of the two NHP models of SIV infection will allow for the characterization of those SIV effects or cellular mechanisms that are critical for those pathogenic and,

conversely, it may lead to the characterization of those mechanisms that antagonize these virus induced defects and contribute to resistance to lentivirus induced immune dysfunction and disease observed in SM.

MORČE – Influence of the nerve agent and reactivators of acetylcholine esterase on the Guinea pig

Novotný, L., Žďárová Karasová, J., Kuča, K., Pohanka, M., Jun, D.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200905)

The aim of this project is determine the physiological activity of Acetyl Choline Esterase (AChE) and detection of LD50 of inhibitors paraoxon, tabun, cyklosarine and reactivators AChE pralidoxim, obidoxim, trimedoxim, HI-6, methoxim. Next task is asses protective effectivity of reactivators. Also detection of AChE activity in organs after intoxication with nerve compound and following reactivation. We will also follow up plasmatic concentration of reactivatos in plasma after i.m. administration and morphological changes in the tissues.

New biological methods of the received dose determination

Šinkorová, Z., Tichý, A., Vilasová, Z., Zárybnická, L., Matiasovic, J., Faldyna, M.

Supported by the Ministry of Education, Youth and Sports, 2008–2010 (Project No.: 2B08028)

In case of accidental irradiation of a human body (irradiation accidents, inappropriate manipulation with radioactive waste, terroristic attack) the medical personnel have to cope with the fundamental task to determine the received dose of ionizing radiation in the most accurate and rapid way. Based on such analysis an appropriate treatment of irradiation disease must begin immediately. Current biodosimetric methods are time-consuming and thus do not fulfill the main task – to begin the treatment as soon as possible, preferably within 24 hr after exposure. In the attempt to provide a faster tool for an irradiation-associated body damage estimate we propose to use multiparametric flow cytometry and microarray analysis of blood lymphocytes cultivated for a defined time interval upon irradiation, which would allow for the received dose estimate by determination of apoptosis progression or changes in protein expression in lymphocyte subsets with different radiosensitivity.

NOTES – Surgical treatment of the digestive tube's penetrating injuries using Natural Orifice Transluminal Endoscopic Surgery

Klein, L., Ferko, A., Šubrt, Z., Novotný, L., Páral, J., Dušek, T., Lochman, P.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200903)

The project is focused on creating the non-devastating penetrating injury model of the digestive tube and testing the possibility for application of the NOTES technology in the treatment. The method uses natural body's orifice (mouth, vagina, urethra, anus) for intraluminal instalation of the double channel operating endoscope into the targeted digestive tube's organ. Through its wall it is put into the free abdominal cavity. Our hypothesis supposes using this method itself or in combination with laparoscopic technique for traumatic defect's closure in the wall without laparotomy. Project will be provided in the porcine model. Animals will be observed for the period of two weeks, and after euthanasia they will be obducted for detection of postoperative complications.

ORCHIDS – Evaluation, optimisation, trialling and modelling procedures for mass casualty

Kuča, K., Simpson, J., Cabal, J.

Supported by the Executive Agency for Health and Consumers, 2008–2011 (Project No.: 100940)

The ORCHIDS project (Optimisation through Research of Chemical Incident Decontamination Systems) involves the evaluation of emergency decontamination methods, and the exercising and modelling of established mass casualty decontamination facilities. The project will deliver quantitative evidence on the optimum techniques for dealing with a range of potential contaminants and scenarios requiring emergency decontamination. A full range of issues will be addressed, from applied toxicological research to mass casualty decontamination exercising and modelling. This applied research will generate evidence-based guidelines on the optimum techniques for effective mass casualty decontamination, which will be disseminated by the project team through a network of EU Partners and stakeholders, which will be established and developed during the project. In addition, the project will consider the provision for minority and vulnerable groups in emergency decontamination, and will produce public information materials (leaflets and educational tools) designed to help increase knowledge, trust and confidence in emergency decontamination provision.

OTRAVA – Novel prophylactic antidotes of nerve agent poisonings based on scavengers

Jun, D., Musílek, K., Pohanka, M., Kuča, K.

Supported by the Czech Republic Ministry of Defence, 2009–2012 (Project No.: OVUOFVZ200902)

Organophosphorus compounds are weaponized in some countries as chemical warfare agents (sarin, tabun, VX). These compounds inhibit enzymes acetylcholinesterase and butyrylcholinesterase. As antidotes of poisonings by these compounds are often used anticholinergics (atropine, benactyzine) and cholinesterase reactivators (pralidoxime, obidoxime, HI-6). Favorable solution is using of specific enzymes (mostly cholinesterases) as scavengers, able to catch toxic organophosphorus compounds in the bloodstream before they start their toxic effect in the organism. We would like to find suitable cholinesterase reactivators, with the aim to suggest and test their combination with enzymes as pseudocatalytic bioscavenger. This combination allows increase prophylactic efficacy of administered enzyme.

PROTEIN – Biosensors for determination of nerve agents and yperites using recombinant proteins and nanotechnology

Pohanka, M., Žďárová Karasová, J., Musílek, K., Kassa, J., Kuča, K.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200807)

The proposed project is aimed at construction of enzyme based biosensors with immobilized ether cholinesterase and/or dehalogenase for detection of nerve agents and yperite using highly innovative nanotechnologies.

REAKTIVÁTOR – Robotized system for in vitro evaluation of novel reactivators of acetylcholinesterase inhibited by nerve agents

Cabal, J., Pohanka, M., Musílek, K., Kuča, K., Jun, D.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200801)

The aim of this project is to develop new robotic system based on sequential injection analysis (SIA) for testing of reactivation potency of newly synthesized antidotes against nerve agent poisonings.

RONSDOZ – Noninvasive measurement of proinflammatory markers of oxidative stress in irradiated as an indicator of received dose of radiation. Protective role of acetyl-L-carnitine

Vávrová, J., Řezáčová, M., Pejchal, J., Österreicher, J., Tichý, A.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200806)

To evaluate whether the bioindicators of oxidative and nitrative stress and inflammations of the airways can be used as biodosimetric markers after exposure to gamma radiation, after whole-body and partial irradiation of rats. To evaluate protective effect of acetyl-L-carnitine.

SUBSTANCE – Development of novel decontaminants and disinfectants of skin based on micellar compounds

Kuča, K., Novotný, L., Musílek, K., Pohanka, M., Jun, D., Cabal, J., Kassa, J.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200803)

The aim of this project is a development of new compound or mixture with a good decontaminant efficacy against wide spectrum of chemical warfare or pesticides. The second aim will be also to gain the universal disinfectant, which will be effective against many kinds of microbes.

The evaluation of potency acetylcholin-esterase reactivators to penetrate through the blood-brain barrier

Žďárová Karasová, J., Kuča, K., Novotný, L.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2010 (Project No.: NS9748)

A penetration of different acetylcho-linesterase reactivators through the blood-brain barrier will be studied. Firstly, the AChE reactivators will be assessed by means of a novel analytical method *in vitro*. Based on previous results, the promising reactivators for *in vivo* evaluation will be chosen on rat animal model (tribe Wistar). Finally, the time-course changes in levels of reactivators in plasma and central nervous system will be determined.

The role of virus associated cellular proteins in T-lymphocyte dysfunction

Boštík, P., Hubálek, M., Řehulka, P., Červený, L., Pejchal, J., Kročová, Z., Boštíková, V.

Supported by the Czech Republic Grant Agency, 2010–2014 (Project No.: GAP304/10/1161)

Herpetic viruses, such as VZV, and lentiviruses, such as HIV or SIV, are enveloped viruses, which infect CD4 T cells and cause transient (VZV) or progressive (SIV) dysregulation of T cell function. This effect is mainly indirect, as the fraction of infected cells is small, but the dysregulatory effect is observed in much larger cell population. These viruses incorporate host-derived proteins into their envelopes during the process of virus maturation and these proteins can either retain their function or engage their receptors and subsequently initiate intracellular signaling. This can be mediated by Akt-GSK3 pathway and PGE metabolism, leading to T cell dysfunction and apoptosis. This proposal utilizes state-of the art proteomic approach to

Identification of host cell proteins incorporated into the SIV and VZV virions. The role of these host cell proteins will be subsequently investigated in their effects on CD4 T cell signaling cascades and can therefore lead to the elucidation of mechanisms involved in CD4 T cell dysfunction and death in such diseases as chickenpox and AIDS.

Whole varicella-zoster virus (VZV) genome sequencing of individual wild type and vaccine strains using GS Junior Benchtop System

Bošťíková, V., Bošťík, P., Smetana, J.

Supported by the Roche co., 2010–2011 (Project No.: VZV)

Monitoring of the varicella-zoster virus epidemiology is becoming an important tool for a world-wide analysis of circulation of the individual strains of VZV, which differ not only at the genomic level, but show a variability in their clinical and epidemiological characteristics. The study will yield important data of genetic diversity of VZV in Czech Republic, which will play an important role in further understanding of epidemiology and evolution of the virus, and may in future serve as a tool for genetic prediction of virus pathogenicity or resistance development. Previous data from several laboratories, predominantly in the US and UK, indicate a specific geographic distribution of these strains as well as their potential propensity for recombination with other wild type (wt) or vaccine strains. New pyrosequencing method using GS Junior Benchtop System of whole VZV genomes further refined the phylogenetic distinctions between SNP genotypes. The new data will bring more light to widespread surveillance in countries in which the varicella vaccine is now in use.

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The staff of the Centre of Information Technologies provides the top quality information service to ensure efficient scientific, research and teaching activities for teaching and research staff as well as under- and postgraduate students of our faculty.

The Centre of Information Technologies consists of two specialized parts – the group of informatics and the group of computer applications.

The group of informatics provides students, research and teaching staff of the Faculty of Military Health Sciences and members of the Czech Army Medical Service with scientific and information services. The main information services are provided by the library with 85 000 library units concerning medicine as well as associated branches. Information sources in the field of military medicine, emergency medicine and disaster medicine are specificity of this library. The library enables access to various information databases (WoK, ScienceDirect, SCOPUS, SpringerLink, BiblioMedica, etc.) and provides systematic help when being used.

The group participates in teaching activities in the doctoral study programmes and scientific education (Ph.D.) by giving lectures in Basics of Informatics focused on retrievals, processing and publication of scientific information. It also takes part in undergraduate programme in military rescue workers.

The group of computer applications provides the operation of the faculty network, enables access to army, specialized and public information systems

and supplies the needs of the Faculty with modern information technologies. Main activity of the group is ensuring the access to INTERNET and to specialized information systems. Management of data network, central management of software, servicing as well as specialized support of users is also provided.

Part of this group are also graphic services that create graphic documents and posters for presentations, make arrangements and changes of drafts for printing, make digital pictures and do other associated work. It also provides the operating and updating of the web site of the Faculty (<http://www.pmfhk.cz>).

The printing-office of the Centre is able to cover reprographic and printing needs of the Faculty by its own sources in limited extent.

DEPARTMENT OF EPIDEMIOLOGY

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KABELKA Zdeněk (till 17 May 2010)
KNÍŽEK Petr (till 17 May 2010)
KRAUSOVÁ Jana
OLEJNÍK Radoslav (till 30 November 2010)
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VALENTA Zbyněk
ZÁLABSKÁ Eva

The Department of Epidemiology as the basic educational and research component of the Faculty of Military Health Sciences (FMHS) is divided into two groups: the epidemiology group and the microbiology, disinfection, disinsection and rodent control group.

The Department of Epidemiology has fulfilled the following main tasks:

It has provided undergraduate education at the FMHS and at the civilian Medical Faculty of Charles University in Hradec Králové, as well as postgraduate training and postgraduate doctoral studies. The teaching activities have been particularly aimed at general and special epidemiology with respect to the topical situation in the Czech Army and in the Czech Republic. The topics of "Emerging and Reemerging, Infectious Diseases", "Travel Medicine" and "Dangerous Pathogens" have also been emphasized. Doctoral study programmes (Ph.D. – epidemiology and medical microbiology) are certified by the Czech Governmental Commission. Since 1997, altogether 26 students have finished their Ph.D. studies.

The Department of Epidemiology plays an important role in education, training and consultancy related to biological threats and weapons.

The members of the department participate in training and education of medical and other personnel dispatched in military peacekeeping and humanitarian missions abroad. The aim is to inform them about any health risks during staying abroad, especially about prevention of infectious diseases, possibilities of vaccination or chemoprophylaxis. They also provide both consultancy service prior to the departure abroad and a practical realization of the respective measures. The Department of Epidemiology provides an epidemiological service for the Field Hospitals of the Czech Army.

Research activities have concerned clinical evaluation of the new vaccines like pneumococcal vaccines, zoster vaccines, Human Papilloma Virus vaccines, rotavirus vaccines, new adjuvante vaccines against viral hepatitis B, Lyme disease vaccines, combined hepatitis B and typhoid fever vaccines, flu vaccines or new vaccination schedules.

Members of the department are members of different Czech journals editorial boards (e. g. "Epidemiologie, mikrobiologie a imunologie" – prof. Špliňo), and they work as reviewers of international journals. Some of them work in a number of committees and boards: Scientific Board of the Ministry of Health (prof. Špliňo), Czech Immunization Committee of the Ministry of Health (prof. Prymula), or European Centre for Disease Control and Prevention (prof. Prymula).

DEPARTMENT OF EPIDEMIOLOGY

Members of the department are also members of NATO working groups and advisory committees for biological threats and weapons (BIOMEDAC – Biological Medical Advisory Committee – doc. Chlíbek).

Disinfection, disinsection and rodent control are very important parts of the medical practice in the Czech Army. This department is the only one of its kind in the Czech Army for the assessment of the antimicrobial efficacy of disinfectants.

The researchers of the microbiology group have also solved questions concerning the prevention of endogenous and exogenous infections in immunocompromised patients. They have also joined the European Study Group on Nosocomial Infections.

RESEARCH PROJECTS

A phase II, observer-blind, randomised, placebo-controlled, adjuvant-dose selection, multicenter prophylactic vaccination study to evaluate the immunogenicity and safety of GSK Biologicals' herpes zoster vaccine, gE/AS01B, in comparison to gE combined with ½ dose AS01B adjuvant (gE/AS01E), to unadjuvanted gE (gE/Saline), and to Saline (placebo) when administered twice in subjects aged 50 years and older

Chlíbek, R., Smetana, J., Kalíšková, E., Vokurková, D.

Supported by the GlaxoSmithKline Biologicals co., 2009–2010 (Project No.: 112077 (Zoster-010))

Herpes zoster or shingles is caused by the reactivation of latent varicella-zoster virus (VZV). The incidence of HZ increases with age, presumably due to waning cellular immunity. GSK Biologicals' candidate HZ vaccine, gE/AS01B, consisting of VZV glycoprotein E (gE) adjuvanted with AS01B has been evaluated in previous studies. The present study will provide comparative data concerning the immunogenicity and safety of 50 µg gE adjuvanted with different doses of AS01B, i.e., full dose AS01B, ½ dose AS01B (= AS01E), and no adjuvant when administered twice (Months 0 and 2) in adults ≥ 50 YOA, and will include a Saline group as a negative control (placebo).

A phase II, single-blind, randomized, controlled, multicentre vaccination study to evaluate the safety and immune response of the GSK Biologicals Zoster vaccine, gE/AS01B, and to compare 3 doses of gE with AS01B adjuvant in healthy elderly subjects, aged 60 to 69 years and 70 years and above

Chlíbek, R., Kalíšková, E., Smetana, J.

Supported by the GlaxoSmithKline Biologicals co., 2007–2010 (Project No.: 108494, Zoster-003)

The safety and immunogenicity of the Varicella Zoster virus (VZV) gE (50 µg)/AS01B vaccine has been evaluated in a previous study. This study intends to compare the immunogenicity and safety of different doses of gE (25, 50 and 100 µg) with AS01B adjuvant and of different schedules of administration (1 vaccination with 100 µg of gE versus 2 vaccinations with different doses of gE) in the healthy elderly (> 70 years) population. Subjects aged 60-69 years will also be enrolled to evaluate the safety and immunogenicity of the vaccine formulations in that age group. A control group vaccinated with 100 µg gE antigen with saline will be included to support justification of the adjuvant.

A phase III, randomized, observer-blind, placebo controlled, multicentre, clinical vaccination trial to assess the prophylactic efficacy, safety and immunogenicity of GSK Biologicals' herpes zoster gE/AS01B vaccine when administered intramuscularly on a 0, 2- month schedule in adults aged 70 years and older

Chlíbek, R., Kalíšková, E., Dítě, P., Vokurková, D., Smetana, J., Gál, P.

Supported by the GlaxoSmithKline Biologicals co., 2010–2015 (Project No.: 113077 (ZOSTER-022))

A phase III, randomized, observer-blind, placebo controlled, multicentre, clinical vaccination trial to assess the prophylactic efficacy, safety and immunogenicity of GSK Biologicals' herpes zoster gE/AS01B vaccine when administered intramuscularly on a 0, 2- month schedule in adults aged 70 years and older. Chlíbek, R., Smetana, J., Gál, P., Dítě, P., Kalíšková, E., Vokurková, D. Supported by the GSK, 2010–2015 (Project No.: 113077 (ZOSTER-022)) Study ZOSTER-022 will provide data on the vaccine efficacy in prevention of herpes zoster (HZ) and Postherpetic neuralgia (PHN) compared to placebo in adults ≥ 70 YOA. The ZOSTER-022 study will enrol subjects in the age ranges 70-79 YOA and ≥ 80 YOA in a 3:1 ratio.

A phase III, randomized, observer-blind, placebocontrolled, multicentre, clinical vaccination trial to assess the prophylactic efficacy, safety, and immunogenicity of GSK Biologicals' herpes zoster gE/AS01B vaccine when administered intramuscularly on a 0, 2-month schedule in adults aged 50 years and older

Chlíbek, R., Vokurková, D., Dítě, P., Kalíšková, E., Smetana, J., Gál, P.

Supported by the GlaxoSmithKline Biologicals co., 2010–2015 (Project No.: 110390 (ZOSTER-006))

Study ZOSTER-006 will provide pivotal data on the overall efficacy in prevention of herpes zoster (HZ) in subjects ≥ 50 YOA. The primary endpoint of this study will be overall HZ vaccine efficacy (VE) across all age cohorts. To this end, ZOSTER-006 will evaluate VE of the gE/AS01B vaccine compared to placebo in reducing the risk of developing HZ in subjects ≥ 50

YOA. This study will enrol subjects in the age ranges 50-59 YOA, 60-69 YOA, 70-79 YOA and ≥ 80 YOA.

A phase 2 partially observer-blind randomized controlled multi-center dose-ranging and formulation-finding study of a new Novartis Meningococcal B Recombinant Vaccine evaluating the safety and immunogenicity when given concomitantly with routine vaccines in 2-month-old infants

Prymula, R., Chlíbek, R., Jarolímek, J., Slavík, Z., Karlová, V., Říhová, J., Hrunka, S., Novák, L.

Supported by the Novartis, 2009–2010 (Project No.: 2009-010106-11)

This study is aimed at assessing the safety and immunogenicity of different doses and formulations (including decreasing OMV contents) of a new Novartis Meningococcal B Recombinant Vaccine (rMenB + OMV NZ) in order to optimize its safety profile while maintaining sufficient immunogenicity. In addition, this study will assess whether prophylactic administration of paracetamol can decrease the incidence of febrile reactions following vaccination without impacting the immunogenicity of rMenB + OMV NZ and the routine infant vaccines. (V72P16)

A phase 2b, open label, multi-center, extension study to evaluate the safety, tolerability and immunogenicity of a booster dose of Novartis meningococcal B recombinant vaccine administered at 12, 18 or 24 months of age in subjects who previously received a three-dose primary series of the Novartis meningococcal B recombinant vaccine as infants in study V72P12

Prymula, R., Chlíbek, R., Jerolímek, J., Slavík, Z., Karlová, V., Říhová, J., Hrunka, S., Novák, L.

Supported by the Novartis, 2010–2012 (Project No.: V72P12E1)

This extension study is designed to investigate the safety, tolerability and immunogenicity of a fourth (booster) dose of rMenB+OMV NZ at 12, 18 and 24 months of age in subjects previously primed with rMenB+OMV NZ in the parent study V72P12 according to the two different three-dose immunization schedules in infancy (2, 3, 4 and 2, 4, 6 months of age) and for the 2, 4, 6 rMenB+OMV NZ schedule, according to two different immunization schedules for routine vaccines (concomitant with rMenB+OMV NZ and staggered).

A phase 2b, open label, randomized, parallel-group multi-center study to evaluate the safety, tolerability and immunogenicity of Novartis Meningococcal B Recombinant Vaccine when administered with or without routine infant vaccinations to healthy infants according to different immunization schedule

Prymula, R., Hrunka, S., Chlíbek, R., Karlová, V., Slavík, Z., Jarolímek, J., Říhová, J., Novák, L.

Supported by the Novartis, 2009–2010 (Project No.: 2008-001592-30)

Novartis is developing a Meningococcal B Recombinant Vaccine (rMenB). In the initial stages of the program, the rMenB antigens were formulated with aluminum hydroxide with or without outer membrane vesicles (OMV). Both formulations have been evaluated in preclinical and clinical studies. The proposed study is aimed to assess the safety and immunogenicity of rMenB+OMV when administered with or without routine infant vaccinations to healthy infants in their first year of life according to different immunization schedules. This study is also aimed to demonstrate that the immunogenicity of routine infant vaccines when given concomitantly with rMenB+OMV at 2, 3 and 4 months of age, is non-inferior to that of routine infant vaccines given without rMenB+OMV NZ. (V72P12)

A phase 3, open label, multi-center, extension study to evaluate the safety, tolerability and immunogenicity of Novartis Meningococcal B Recombinant Vaccine when administered as a booster at 12 months of age or as a two-dose catch-up to health toddlers who participated in study V72P13

Prymula, R., Chlíbek, R., Jarolímek, J., Slavík, Z., Karlová, V., Říhová, J., Hrunka, S., Novák, L.

Supported by the Novartis, 2009–2010 (Project No.: 2008-006301-17)

Novartis is developing a Meningococcal B Recombinant Vaccine (rMenB). To date, the tolerability, safety and immunogenicity of the rMenB+OMV NZ final formulation has been investigated. This extension study, will aim to enroll subjects who completed the parent study V72P13. Subjects who received three doses of rMenB+OMV NZ will be randomized to receive a fourth (booster) dose of rMenB+OMV NZ at 12 months of age. (V72P13E1)

A phase 3, open-label, multi-center, extension study of V72P13E1 to assess antibody persistence at one year after a fourth dose boost or two catch-up doses of Novartis meningococcal B recombinant vaccine administered starting at 12 months of age and to evaluate the response to a third dose boost or two catch-up doses starting at 24 months of age

Prymula, R., Chlíbek, R., Jerolímek, J., Slavík, Z., Karlová, V., Říhová, J., Hrunka, S., Novák, S.

Supported by the Novartis, 2010–2012 (Project No.: V72P13E2)

Novartis is developing a Meningococcal B Recombinant Vaccine (rMenB). To date, the tolerability, safety and immunogenicity of the rMenB+OMV NZ final formulation has been investigated. This extension study, will aim to enroll subjects who completed the parent study V72P13 and V72P13E1.

A phase 3, partially blinded, randomized, multi-center, controlled study to evaluate immunogenicity, safety and lot to lot consistency of Novartis Meningococcal B Recombinant Vaccine when administered with routine infant vaccinations to healthy infants

Prymula, R., Chlíbek, R., Říhová, J., Karlová, V., Novák, L., Jarolímek, J., Slavík, Z., Hrunka, S.

Supported by the Novartis, 2009–2010 (Project No.: 2007-007781-38)

Novartis is developing a Meningococcal B Recombinant Vaccine (rMenB). The proposed study is aimed to assess the immunogenicity and safety of rMenB+OMV NZ and the consistency of immune response from 3 lots of rMenB+OMV NZ and to demonstrate that the immunogenicity and safety of routine infant vaccines when given concomitantly with rMenB+OMV NZ at 2, 4 and 6 months of age, is non-inferior to that of routine infant vaccines given without rMenB+OMV NZ. (V72P13)

LEPTOSPIROSIS – Risk evaluation and new possibilities of detection

Čermáková, Z., Smetana, J., Kolínková, L., Ošťádal, A., Krejčová, R., Valenta, Z., Douda, P., Navrátilová, L., Neubauerová, V., Fajfr, M.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUVZU2008001)

The aim of this four-year study is to evaluate territory of Czech Republic according to leptospirosis acquiring risk with special regard for military training areas and AOR of Czech armed forces in NATO and UN missions abroad., analyze collected data and create standard operational protocol for exercise and field operations' areas with significant risk of leptospirosis. Compare analytical efficacy of available diagnostic methods for leptospires detection. Precise and accelerate direct proof of leptospiral DNA from patients' and environmental samples and pick up the most suitable

method with possibility of rapid and precise detection able to work in field, fully satisfying all the requirements of Czech armed forces.

The presence of sortase enzymes SrtB, SrtC and SrtD in clinical isolates of *Streptococcus pneumoniae* and their role in the virulence and resistance to antimicrobials

Žemličková, H., Prymula, R.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2011 (Project No.: NS9643)

The Project objective is to study the distribution of the SrtB, SrtC and SrtD genes in clinical isolates of pneumococci. These genes are part of the RlrA pathogenicity islet that produces the pneumococcal pilus. The prevalence of these genes in various serotypes and defined genotypes of pneumococci will be established. The distribution of particular genes among invasive pneumococcal strains (isolated from blood or CSF) and in strains isolated from the upper respiratory tract will be analyzed and the prevalence of the sortase genes among penicillin non-susceptible and penicillin susceptible strains will be compared. A better knowledge of the distribution of the sortase genes among pneumococcal clinical isolates will be helpful in understanding the role of the pneumococcal pilus in the development of either invasive or respiratory (otitis media acuta) disease. The ability of some pneumococcal serotypes to colonize permanently the nasopharynx is likely to be implicated in the development of penicillin resistance. In strains with reduced susceptibility to penicillin, the presence of the pilus as a factor contributing to the development of resistance to antimicrobials in pneumococci will be studied. The obtained results will be of relevance to the fulfilment of Target 6 and two 08 priorities – Analysis of causes and circumstances of the emergence and spread of resistance to antimicrobials and Elucidation of the pathogenesis of infectious processes with a focus on the preparation of novel vaccines and innovation of the available vaccines for the prevention and therapy.

The role of virus associated cellular proteins in T-lymphocyte dysfunction

Boštík, P., Hubálek, M., Řehulka, P., Červený, L., Pejchal, J., Kročová, Z., Boštíková, V.

Supported by the Czech Republic Grant Agency, 2010–2014 (Project No.: GAP304/10/1161)

Herpetic viruses, such as VZV, and lentiviruses, such as HIV or SIV, are enveloped viruses, which infect CD4 T cells and cause transient (VZV) or progressive (SIV) dysregulation of T cell function. This effect is mainly indirect, as the fraction of infected cells is small, but the dysregulatory effect is observed in much larger cell population. These viruses incorporate host-derived proteins into their envelopes during the process of virus maturation

and these proteins can either retain their function or engage their receptors and subsequently initiate intracellular signaling. This can be mediated by Akt-GSK3 pathway and PGE metabolism, leading to T cell dysfunction and apoptosis. This proposal utilizes state-of the art proteomic approach to Identification of host cell proteins incorporated into the SIV and VZV virions. The role of these host cell proteins will be subsequently investigated in their effects on CD4 T cell signaling cascades and can therefore lead to the elucidation of mechanisms involved in CD4 T cell dysfunction and death in such diseases as chickenpox and AIDS.

Whole varicella-zoster virus (VZV) genome sequencing of individual wild type and vaccine strains using GS Junior Benchtop System

Bošťíková, V., Bošťík, P., Smetana, J.

Supported by the Roche co., 2010–2011 (Project No.: VZV)

Monitoring of the varicella-zoster virus epidemiology is becoming an important tool for a world-wide analysis of circulation of the individual strains of VZV, which differ not only at the genomic level, but show a variability in their clinical and epidemiological characteristics. The study will yield important data of genetic diversity of VZV in Czech Republic, which will play an important role in further understanding of epidemiology and evolution of the virus, and may in future serve as a tool for genetic prediction of virus pathogenicity or resistance development. Previous data from several laboratories, predominantly in the US and UK, indicate a specific geographic distribution of these strains as well as their potential propensity for recombination with other wild type (wt) or vaccine strains. New pyrosequencing method using GS Junior Benchtop System of whole VZV genomes further refined the phylogenetic distinctions between SNP genotypes. The new data will bring more light to widespread surveillance in countries in which the varicella vaccine is now in use.

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The Department of Field Internal Medicine focuses systematically on the specialized postgraduate level of medical studies in the branch of field

DEPARTMENT OF FIELD INTERNAL MEDICINE

internal medicine. This discipline deals with specific military problems, in particular with the problem of saving the lives of patients suffering from serious and life-threatening conditions of non-surgical character. Such injuries generally occur during mass disasters both in wartime and in peacetime.

In the Department of Field Internal Medicine the development of military internal medicine follows three basic directions or areas: therapy and prevention, pedagogical and educational methods, and scientific research:

- Work in therapy and prevention is essential for military internists, because it enables us to acquire and develop good professional aptitude and experience in care for the seriously ill.
- The pedagogical and educational aspect of our work follows from our therapeutic/preventive activities. The Department coordinates the Branch Council of Clinical Medical Fields and the Branch Council of Postgraduate Study for Doctorates in Accredited Disciplines of Field Internal Medicine (equivalent of Ph. D.).
- Scientific research is the Department's third main area of activity. Essentially, it extrapolates the results of applied clinical research into specific military conditions and into medical care under field conditions.

In 2010 the research in the Department continued in the five basic fields:

- Haematology – growth of stem cells – preparation for bone marrow transplantation.
- Biochemical and electrophysiologic investigation and monitoring of acute coronary syndromes.
- Cardiotoxicity of antitumorous therapy.
- Diagnosis and therapy of hypercoagulative states – the monitoring of anticoagulant therapy.
- Global quality of life in patients who have undergone the hematopoietic stem cell transplantation

Cooperation in the clinical research:

1. Haematopoietic stem cell transplantation. A role of cytokines in transplantation. Transplant-related complications and supportive care has continued.
2. A study in the application of enteral and parenteral nutrition in intensive metabolic care has continued.
3. The study of supraventricular tachycardias – electrophysiologic investigation and therapy including radiofrequency ablation has continued.

4. Participation (co-investigators) on international study IRIS – Immediate Risk-stratification Improves Survival, primary prevention of sudden cardiac death.
5. Cardiotoxicity of antitumorous therapy – the research project has continued.
6. Projects have been carried out in the field of determination and analysis of monoclonal immunoglobulins in the urine of patients with multiple myeloma.
7. New biochemical cardiac markers (cardiac troponin T, high sensitivity CRP, brain natriuretic peptide) – clinical and laboratory evaluation has continued.
8. Analysis of transplantation activities, indications and results in the Czech Republic – National Stem Cell Transplantation Registry.
9. Phase III trial of combined immunochemotherapy with Fludarabine, Cyclophosphamide and Rituximab (FC-R) versus chemotherapy with Fludarabine and Cyclophosphamide (FC) alone in patients with previously untreated chronic lymphocytic leukemia. CLL-8/ML 17102 Protocol of the GCLLSG (German CLL Study Group) Dept. of Internal Medicine I, University Hospital Cologne, Germany.
10. GvHD prophylaxis with ATG-Fresenius S in allogeneic Stem Cell Transplantation from matched unrelated donors: A randomised phase III multicenter trial comparing a standard GvHD prophylaxis with cyclosporine A and methotrexate with additional pretransplant ATG-Fresenius S. Project-No. (Fresenius): AP-AS-21-DE, Project-No. (ZKS): S020801 Medizinische Klinik I, Universitätsklinikum Freiburg .
11. Research project: MZO 00179906 (Czech Ministry of Health), Bioindicators in Hematology and Internal Medicine.
12. A Double-Blind, Randomized, Placebo-controlled Study of Two Different Schedules of Palifermin (Pre- and Post Chemotherapy and Pre-Chemotherapy only) for Reduction in Severity of Oral Mucositis in Subjects with Multiple Myeloma (MM) Receiving High Dose Melphalan followed by Autologous Peripheral Blood Stem Cell Transplantation (PBSCT): AMGEN, Protocol no. 20050219.
13. Military – medical aspects of war surgery and war internal medicine (MO0FVZ0000503).

DEPARTMENT OF FIELD SURGERY

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Structure and main tasks of the department:

Division of General Surgery

Páral Jiří – Head of the Group

Division of Traumatology and Burns Treatment

Čáp Robert – Head of the Group

Main tasks:

- Undergraduate education of medical students
- Postgraduate training of military medical specialists and surgeons
- Expertise and referential work for needs of the Czech Army
- Research
- Preparation of health personnel before foreign missions of the Czech Army

At present the Department of Field Surgery consists of two groups – the Group of General Surgery and the Group of Traumatology and Burns Treatment. Besides working at each Division of the Department of Surgery of the Teaching Hospital in Hradec Králové, the members of the Department perform both, undergraduate courses in field surgery for students of the Faculty of Military Health Science, and postgraduate training of military physicians for their specialization exams in surgery and general medicine. The Department also participates in teaching of the Battlefield Advanced Trauma Life Support (BATLS) courses, disaster medicine and the first aid courses, organized by the Faculty of Military Health Sciences for the Czech Army members. In the last several years, the Department has played important role in education and training of the personnel of field hospitals operating in foreign missions (Yugoslavia, Bosna-Herzegovina, Albania, Iraq, Afghanistan). Members of the Department also took part in that missions. Research and publication activities are also essential part of the Department work. The evidence of all above mentioned is particularly scientific success of Prof. A. Ferko, MD, Ph.D, who was awarded the prize in medical research by the Ministry of Health in 1998 and his monography (Endovascular Treatment of Arterial Aneurysms) was awarded the Maydl's prize for the best publication in surgery in 1999.

Participation in a foreign mission:

- F. Hošek – UNTS, Zagreb, Croatia, 1996
- Ferko – International Hospital, SFOR, Shipovo, Bosna and Hercegovina, 2001
- R. Čáp – International Hospital, SFOR, Shipovo, Bosna and Hercegovina, 2001

DEPARTMENT OF FIELD SURGERY

- Ferko – 11th Field Hospital, Army of the Czech Republic, ISAF, Kabul, Afghanistan, 2002
- J. Páral – 11th Field Hospital, Army of the Czech Republic, ISAF, Kabul, Afghanistan, 2002
- M. Plodr – 11th Field Hospital, Army of the Czech Republic, ISAF, Kabul, Afghanistan, 2002
- Žvák – 11th Field Hospital, Army of the Czech Republic, ISAF, Kabul, Afghanistan, 2002
- D. Dobeš – British Field Hospital, Op TELIC, Shaibah, Iraq, 2004
- J. Páral – British Field Hospital, Op TELIC, Shaibah, Iraq, 2004
- M. Plodr – British Field Hospital, Op TELIC, Shaibah, Iraq, 2004
- P. Lochman – British Field Hospital, Op TELIC, Shaibah, Iraq, 2004
- M. Plodr – 1st Contingent of Field Hospital, Army of the Czech Republic, ISAF, KAIA, Kabul, Afghanistan 2007
- Žvák – 1st Contingent of Field Hospital, Army of the Czech Republic, ISAF, KAIA, Kabul, Afghanistan 2007
- P. Lochman – 4th Contingent of Field Hospital, Army of the Czech Republic, ISAF, KAIA, Kabul, Afghanistan 2008

National textbooks:

- Endovascular Treatment of Arterial Aneurysms (Ferko et al.)
- Handbook of Surgery (Ferko et al.)
- Principles of War Surgery (Klein, Ferko et al.)
- X-ray Atlas of Bone Fractures (Žvák et al.)
- Small Atlas of Bandaging Techniques (Páral)

RESEARCH PROJECTS

ACETABULA – Crossover external fixator of acetabular fractures

Žvák, I., Klein, L., Šmejkal, K., Frank, M.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200904)

Pelvic fractures associated with acetabular fractures are severe injuries both, in civilian practice and on the battlefield. It is necessary to solve the problem of temporary stabilization of these fractures, in consequence of improvement battlefield medical care, as well as medical evacuation. This stabilization has to be suitable for Medical Support System. Aggravation of ill health condition of patient and worse clinical outcome can be the result, if these fractures are not stabilized during temporary hospitalization and medical evacuation. The aim of this study is development and

biomechanical testing of new crossover external fixator frame for pelvic and acetabular fractures, based on commonly used external fixator device.

Advanced Training Course: “Best Way of Training for Mass Casualty Situations”

Klein, L., Michaelson, M.

Supported by NATO Science for Peace and Security (SPS) Programme, 2009–2010 (Project No.: CBP.MD.ATC.983603)

A threeday course sponsored by the NATO Science for Peace and Security programme on 16–18 November, 2009, in Haifa, Israel, provided training for emergency management professionals on staff teaching and preparation methods in the face of mass casualty situations. 26 participants from the Partnership for Peace programme and Mediterranean Dialogue countries attended and graduated from the course.

LEPIDLO – Testing of possible use of cyanoacrylat tissue glues in high risk intestinal anastomoses

Páral, J., Klein, L., Šubrt, Z., Plodr, M., Lochman, P.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200804)

The experimental study is aimed to validate technical and biological possibilities of the cyanoacrylate tissue adhesives in the intestinal surgery and its using on the healing of high-risk anastomoses as a supporting element of conventional suturing.

NOTES – Surgical treatment of the digestive tube's penetrating injuries using Natural Orifice Transluminal Endoscopic Surgery

Klein, L., Ferko, A., Šubrt, Z., Novotný, L., Páral, J., Dušek, T., Lochman, P.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200903)

The project is focused on creating the non-devastating penetrating injury model of the digestive tube and testing the possibility for application of the NOTES technology in the treatment. The method uses natural body's orifice (mouth, vagina, urethra, anus) for intraluminal instalation of the double channel operating endoscope into the targeted digestive tube's organ. Through its wall it is put into the free abdominal cavity. Our hypothesis supposes using this method itself or in combination with laparoscopic technique for traumatic defect's closure in the wall without laparotomy. Project will be provided in the porcine model. Animals will be observed for the period of two weeks, and after euthanasia they will be obducted for detection of postoperative complications.

DEPARTMENT OF GENERAL AND EMERGENCY MEDICINE

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The Department of General Medicine was established at the J. E. Purkyně Military Medical Research and Postgraduate Institute in 1983. It was formed from the former Group of Military Medical Service Organization in Peacetime which existed at the Department of Military Medical Service Organization. The reason for the foundation of the Department was the need to educate military doctors in newly established branch of General Medicine that became the basic branch for military doctors who were in charge of primary care in the Military Medical Service organizational structures. Specialization in the branch of internal medicine was insufficient and did not meet professional requirements for individual medical practice at Units and later at Garrison Dispensaries. First Specialization Exams in this new basic specialization branch were held in February 1985. 525 military doctors passed the Specialization Exam in General Medicine till 31st December 2004.

Since 1997, the work at this Department has focused more on pre-hospital emergency care and teaching the First Aid and Emergency Medicine. At the same time a significant modernization and a proper subdivision of teaching premises according to the type of courses were carried out there. Now the Department is equipped with modern teaching models and simulators for teaching pre-hospital care, including the possibility of interactive teaching aids. Current innovations of medical material and equipment are applied in teaching process. The extension of teaching

activities in this new field called for changes in table posts at the Department. In 2001, the Healthcare Education and Training Group was established and other workers were engaged to teach the first aid. Since 2003, regarding the extension of teaching, the Department has had a new name – the Department of General and Emergency Medicine.

The Department of General and Emergency Medicine is the main department providing military-professional training in the subject called Military Medical Service Organization in Peacetime for students of the Master's Study Programme in branches of General Medicine and Military Pharmacy, and for students of the Bachelor's Study Programme in the branch of Military Medical Management and in various types of training and courses. It also provides further education for military doctors, pharmacists and other personnel of the Military Medical Service through refresher courses and specialization courses. Until 2005, the Department was the leading department focused on specialization training of military doctors served in the Czech Army Medical Service. It organizes pre-graduate courses in emergency medicine in Master's Study Programme, but especially post-graduate education of doctors, health care workers and nurses. The Department of General and Emergency Medicine collaborates with the Institute of Postgraduate Medical Education in Prague, the Chamber of Medicine, professional medical societies and associations in postgraduate training and specialized activities. It participates in establishing standards for special therapeutic care.

The subject called Disaster Medicine makes students acquainted with principles of emergency medicine and operation of individual parts of integrated rescue system in conditions of serious accidents, natural disasters and catastrophes. In connection with this training, the Department provides its participants with knowledge and experience of the operation of the Military Medical Service institutions and facilities in crisis, in combat or other extraordinary situations. It applies the knowledge of military and military-professional subjects into specific conditions of operation of the Military Medical Service respecting both military principles and requirements as well as the principles of humanity, law and especially Geneva Conventions.

The main mission of the Department is education and training of medical officers in casualty medical care in both combat and disaster situations. For this purpose, the principles and procedures of emergency care in field conditions are taught at the Department through BATLS/BARTS (Battlefield Advanced Trauma Life Support/Battlefield Advanced Resuscitation Techniques and Skills) courses. In the same area, the Department participates in training of medical personnel before their departure to foreign missions.

The next important mission of the department is education and training of non-medical personnel in first-aid care. The most of the soldiers are trained in the Battlefield First-Aid Courses, some of them are trained in consequential Combat Life Saver Courses. This course lasts 3 weeks and

offers a lot of useful knowledge and skills, e.g. making intravenous access. The graduates of this course must be able to give first aid to casualty with very realistic looking injuries prepared by professional masker at the end of the course.

The Department is a co-ordinating centre of scientific work in the branch of Military Medical Service Organization in Peacetime, Social Medicine, Emergency Medicine and Disaster Medicine. It participates in increasing the quality of organisational structure of medical units, formations and facilities. It elaborates their operation procedures and principles of their management in peacetime as well as in emergency situations. The Department provides expert activities and elaborates data and proposals from these areas for concept-making bodies of the Czech Army Medical Service. The Department analyzes NATO regulations and directives and recommends their introduction in practice as well as in teaching process. It provides consultations for field leading officers of the Military Medical Service. The Department cooperates with civilian institutions, namely, with the bodies of the Ministry of Health of the Czech Republic in the issues concerning the cooperation between civilian and military medical service in extraordinary situations. It ensures publication activities focused on educational work requirements and on presenting scientific information. The Department is in charge of the education of talented students within the framework of students' scientific and professional activities. It participates in the solution of assignments within the organizational structure of the military health care in peacetime. It is the consultation and expert workplace in the branch of General and Emergency Medicine for the Army of the Czech Republic.

RESEARCH PROJECTS

Support of basic and advanced life support education

Matoušek, R.

Supported by ČEZ, 2010–2010 (Project No.: VCE/16/10)

Project is focused for improving theoretical knowledges and practical skills in the field of first aid. The Guidelines for CPR 2005 are included in this project.

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The Department of Military Health Service Organization is the primary department which offers military and professional training and education for students of medicine, pharmacy, military medical management, as well as for paramedical personnel to the extent necessary for the execution of their duties in a wartime health care system. It organizes postgraduate education for military doctors, pharmacists and bachelors in advanced courses and the training of reserve medical officers. It offers specialized training in the field of military health service administration and management. It is responsible for providing career courses to military medical personnel.

The subject called "Organization and Tactics of Military Medical Service in Wartime" familiarizes students with the activities of the Medical Service in combat conditions, with the assignments and principals of medical support to troops, the organizational structure of the military health service in combat, the operation of particular medical establishments and the principles of human rights – in particular those defined by the Geneva Convention. The department carries out training in medical support planning, in working with map, triage of casualties, deployment of field medical facilities, calculation of medical casualties and the Military Medical Service management.

Other subjects provide students with knowledge in tactic, logistics, communications, military engineering, topography, and NBC defence. All these subjects are a part of the general military education of Czech Army

DEPARTMENT MILITARY HEALTH SERVICE ORGANIZATION

professionals and are prerequisites of mastering the subject of military medicine.

The department teaches disaster medicine, mainly focused on planning, administration, management and evacuation.

The department serves as a coordinating centre for the field of research work in the discipline of the Military Medical Service Organization and Management. It participates in achieving a better quality of organization in medical units, formations, facilities, operational regulations, and management methods in wartime. It sets out the basic materials and proposals from the above – mentioned areas for the Czech Army Medical Service authorities.

DEPARTMENT OF MILITARY HYGIENE

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DEPARTMENT OF MILITARY HYGIENE

The Department of Military Hygiene is divided into several relatively independent groups, the work of which is interconnected and it complexly covers the basic issues of the relation of life and job environment to the health of the individual.

- a) In the area of Hygiene of Nutrition and Occupational Hygiene, attention is paid namely to the incidence and prevalence of risk factors of non-infectious diseases of mass incidence, rational food, catering of troops in peacetime and wartime conditions – emergency food rations, assessment of the proper received and consumed energy. Occupational Hygiene is focused above all on response of the organism to work in protective clothing and severe climatic conditions and on evaluation of the degree of risk connected with environment contamination.
- b) The Group of Communal Hygiene is oriented on the analysis of selected physical and chemical factors of external environment in the conditions of the Army of the Czech Republic (ACR) It studies the possibilities of use of chemical substances for disinfection effects.
- c) Psychology of Health (Psycho-hygiene, Mental Hygiene) is an inseparable part of the Department teaching and research. A biopsychosocial model of health (disease) is its theoretical and methodological basis. At present, attention is paid to the following areas: vulnerability (hardiness) and its role in occurrence and development of disease, coping with stress and difficult life situations, current knowledge in the area of changes of behavior as a part of therapy of chronic patients and prevention of social and pathological phenomena. The mentioned areas are included in teaching, research and advisory activities of the department.

Pedagogical activities of the Department of Military Hygiene were and still are considerably wide. The Department fully participates in a basic pre-graduate and post-graduate education of military doctors and in co-operation with the Institute for Postgraduate Medical Education in Prague; it takes part in the preparation of civilian physicians. The pre-graduate education pays attention to the students of the 3rd year of Pharmacy, the 4th and 5th year of Stomatology and especially to the students of the 5th and 6th year of General Medicine. The Department of Military Hygiene members participate in teaching basic warrants officers' courses, commanders in reserve courses, recruited nurses courses, and co-operate in teaching BATLS and BARTS courses. In the last few years, they have elaborated specialized training programs for teams of rescuers, for the participants of NATO foreign missions and a course for foreigners – NBC, CISD, IMS.

RESEARCH PROJECTS

Hemodynamic, clinical and biochemical monitoring of patients before and after transjugular intrahepatic portosystemic shunt (TIPS), part. IV

Hůlek, P., Hlúbik, P., Fajfrová, J., Krajina, A.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2011 (Project No.: NS10363)

The objectives of project is to found more effective diagnostic and medical treatment for patient with chronic portal hypertension in order to decrease its morbidity and mortality, first of all in context with hemodynamic changes of portal hypertension and with therapeutic intervention – transjugular construction of a portosystemic shunt (TIPS). Project has a 3 primary objectives:

- 1) Study of pulmonary hemodynamic and potential disorders of pulmonary function during portal hypertension with aim at discovered link between hepatopulmonary syndrom and changes of circulation during portal hypertension (PH) and found its potential therapeutic intervention (methods: measure the central hemodynamic parameters, blood oxygenation and analysis of its link with activity of relevant mediators and cytokines; complex clinical, functional and display examination of lung).
- 2) Prospectives analysis of impact of TIPS aimed at to found prognostic factors and mechanisms of its favourable and adverse effects:
 - a. From liver encephalopathy point of view: examination of changes and progress in brain circulation (SPECT), genic polymorphism and changes in BDNF production.
 - b. Examination of liver functions with modern tests with indocyanin green and ¹³C-Aminopyrin and its changes after TIPS and its prognostic importance compare with ordinary biochemical indicators.
 - c. Examination of changes in metabolic rate, plasmatic level of amino acids, nutritional status and overgrowth of intestinal microflora in association with TIPS and study its influence on morbidity and mortality after TIPS.
- 3) Study of influence of incretins and others factors in disorders of glucosic tolerance during liver cirrhosis and PH and impact of TIPS.

Change of body proportion of school children

Střítecká, H.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2010 (Project No.: 9985)

The aim of project is to describe dietary habit school children using simple food frequency questionnaire, which will be focused on the consumption of meat, fish, milk, eggs, vegetables, fruit, type of beverage and

sweets. Children will complete 24-hour recall too. The next is compare basic anthropometrical parameters (weight, height, waist, % body fat) on elementary school children in 2nd, 4th, 6th and 8th grade in district Hradec Kralove, Pardubice and Liberec, split not only by age, gender, but by living environmental (town, village, small town), too.

DEPARTMENT OF PUBLIC HEALTH

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The primary focus of the Department of Public Health (K-309) is aimed at the integration of health care, pharmaceutical and managerial branches to efficiently support the Medical Service of the Czech Army, particularly in the field of disaster medicine and emergency planning, and education of medical and non-medical healthcare personnel in lifelong learning programs.

The department consists of three groups – the Healthcare Management Group, the Military Pharmacy Group and the Fitness Preparation Group.

Teaching activities are one of department's main tasks. The department takes part in undergraduate programs in military health care management, military medicine, military pharmacy and military rescue workers. In addition, teachers run courses and training programs in health care management, medical emergency planning, critical incident stress management, bio-informatics and statistics, health economics and medical law. The department participates in preparation of medical troops for foreign missions.

Research activities play an important role. The research is oriented towards process modelling, particularly in the context of healthcare facilities, emergency situations, major incidents, geographical information systems

DEPARTMENT OF PUBLIC HEALTH

in emergency planning, and medical visualization. Members of the department concentrate on the development and application of information technologies in all the mentioned fields. By actively participating in both local and international conferences, the department has established valuable co-operations with national and foreign universities.

The department has been involved in international projects creating centres and methodologies for healthcare management education and for regional healthcare policies.

Department's research projects have been supported by Czech Science Foundation, Foundation of Ministry of Health, and Foundation of Ministry of Defence.

DEPARTMENT OF RADIOBIOLOGY

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The Department of Radiobiology was established at Purkyně Military Medical Research and Postgraduate Institute on September the 1st 1963. The first chief of the department became Colonel Prof. MUDr. Josef Mráz, CSc., who was in 1968 appointed the first professor of military radiobiology of the Charles University. The main tasks of the department are teaching and research activities which are closely connected.

In the field of research, the experimental work includes histology and cytology, in vitro method, methods of proteomic analysis and of methods of flow cytometry. Individual technological units allow in vitro and in vivo observation of post-radiation mechanisms on molecular, cellular and organ levels.

Military research is focused on early diagnosis and therapy of post-radiation damage in the main objective of the department. The aim of

investigation in the medium-term horizon is discovery and practical introduction of bio-dosimetric markers as well as repeated renewal of decontamination agents for the Army of CR. Mutual cooperation with other NBC research workplaces also remains an integral part of our research activities. Cooperation with civilian work places at the Faculty of Medicine and the University Hospital in Hradec Králové is focused on radiation oncology.

The Department of Radiobiology takes part in military medical-specialist education in form of pre-gradual and post-gradual education mainly in doctoral studies. The main educational activity was to give lectures in military radiobiology. The main topics are: the nuclear weapons effects on living organism, the possibilities of the protection and medical treatment of irradiated persons. Next special military subjects are disaster medicine and NBC protection etc. which are taught at the Faculty of Military Health Sciences, include topics which are presented by the instructors of our department.

RESEARCH PROJECTS

Differential proteome analysis of bacterial *Francisella tularensis* glyco- and phospho- proteins

Hernychová, L., Klimentová, J., Bílková, Z., Tichý, A., Balonová, L., Stulík, J.
Supported by the Ministry of Education, Youth and Sports, 2008–2010
(Project No.: ME08105)

Post-translational modifications (PTM) of proteins play crucial role in the assembly, degradation, structure, and function of exprimed genes. PTM of proteins of bacterial pathogens strongly influence the nature of interaction with host cell system. However, little is known about the character and function of such modifications for intracellular bacteria. The main objective of the project is focused on the analysis of *Francisella tularensis* proteins, their post-translational modifications as glycosylation and phoshorylation. The aim of the research is to describe their structure in context with pathogenity and virulency of various subtypes of bacterial strains, differing in level of virulency. The strategy approach will be based on technologies that combine modern separation methods with mass spectrometry structure identification. The biofunctionalized magnetic nanoparticles with lectins, metal ions or specific mono(poly)clonal antibodies permit sufficient selectivity for glycosylated or phoshporylate.

INDIKÁTOR II – Reverse detection of received ionizing radiation dose by monitoring of cell population changes using biophysical methods

Šinkorová, Z., Tóthová, I., Pejchal, J., Zárybnická, L., Kročová, Z., Österreicher, J.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200809)

To establish extrapolated calibration curve for determination the received dose in individuals exposed to ionizing radiation which could be practical used in the Czech army and to design the best enlistment of this biophysical method into the therapeutic-transfer system of the Czech army.

New biological methods of the received dose determination

Šinkorová, Z., Tichý, A., Vilasová, Z., Zárybnická, L., Matiasovic, J., Faldyna, M.

Supported by the Ministry of Education, Youth and Sports, 2008–2010 (Project No.: 2B08028)

In case of accidental irradiation of a human body (irradiation accidents, inappropriate manipulation with radioactive waste, terroristic attack) the medical personnel have to cope with the fundamental task to determine the received dose of ionizing radiation in the most accurate and rapid way. Based on such analysis an appropriate treatment of irradiation disease must begin immediately. Current biodosimetric methods are time-consuming and thus do not fulfill the main task – to begin the treatment as soon as possible, preferably within 24 hr after exposure. In the attempt to provide a faster tool for an irradiation-associated body damage estimate we propose to use multiparametric flow cytometry and microarray analysis of blood lymphocytes cultivated for a defined time interval upon irradiation, which would allow for the received dose estimate by determination of apoptosis progression or changes in protein expression in lymphocyte subsets with different radiosensitivity.

NK cells and their response to ionizing irradiation

Zárybnická, L., Šinkorová, Z.

Supported by the Czech Republic Ministry of Education, Youth and Sports, 2010–2011 (Specific research project).

This study is aimed at specific radiosensitivity of NK cells to ionizing irradiation. NK cells belong to functional white blood cells which care for anti-tumour and anti-viral control in organism. Nevertheless their responses to irradiation is not clearly known yet. Their *in vivo* and *ex vivo* radiosensitivities are studied as relative representation changes in peripheral blood within Wistar rats and large white pigs experimental models. Obtained results will be useful for retrospective dosimetry and back estimate of absorbed dose of ionizing irradiation.

RONSDOZ – Noninvasive measurement of proinflammatory markers of oxidative stress in irradiated as an indicator of received dose of radiation. Protective role of acetyl-L-carnitine

Vávrová, J., Řezáčová, M., Pejchal, J., Österreicher, J., Tichý, A.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200806)

To evaluate whether the bioindicators of oxidative and nitrative stress and inflammations of the airways can be used as biodosimetric markers after exposure to gamma radiation, after whole-body and partial irradiation of rats. To evaluate protective effect of acetyl-L-carnitine.

Study of factors in a tissue microenvironment that influence the process of skeletal muscle repair

Filip, S., Vávrová, J., Mokřý, J., Šinkorová, Z., Tichý, A., Čížková, D., Řezáčová, M.

Supported by the Czech Republic Grant Agency, 2008–2010 (Project No.: GA304/08/0329)

Degeneration of the cardiotoxin-damaged skeletal muscle is followed by a subsequent tissue repair, which is a multistep process that is well morphologically defined. We modify this process with gamma irradiation before and after induction of a muscle damage, which impairs a natural course of myofibre regeneration and makes a space for transplanted exogenous cells (CD117+, Sca-1+ bone marrow cells). Progeny of transplanted exogenous vector, lacZ gene, is identified histochemically. A part of the study involves examination of kinetics of haemopoietic stem cells after lethal irradiation and transplantation of stem cells.

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The Department was established in 1951. Since then, as an integral part of the Faculty of Military Health Sciences, it has been involved in education and scientific research work on chemical warfare agents for defensive and protective purposes only. It comprises two laboratory groups – a biochemical (biochemical laboratory, laboratory of organic synthesis, analytical laboratory, decontamination laboratory) and an experimental therapy group (toxicological laboratory, pharmacological laboratory, neurophysiological laboratory, behavioral laboratory, genotoxicological laboratory). This structure permits the complex study of highly toxic substances including chemical warfare agents with aims to determine their action on biochemical, behavioral, histochemical, pharmacological and neurophysiological level, to study and develop antidotes, to analyse all types of samples with respect to the presence of known chemical warfare agents, to test decontamination effectiveness of developed and field decontamination kits. Present scientific research projects are focused on therapeutic, prophylactic and protective measures against the most toxic chemical warfare agents. Special attention has been paid to the most recent and most dangerous nerve agents and mustards. The main educational activity task was to give lectures for undergraduate and post-graduate studies dealing with problems of biological effects of real and potential chemical warfare agents, the possibilities of the medical and chemical protection against them and the approaches to medical care of persons intoxicated with chemical warfare agents, especially nerve agents. The Department of Toxicology also participates in the teaching of toxicology in disaster medicine.

RESEARCH PROJECTS

Development of novel acetylcholinesterase inhibitors as treatment of Myasthenia Gravis

Musílek, K.

Supported by the Czech Republic Grant Agency, 2009–2011 (Project No.: GP203/09/P130)

The treatment of autoimmune disease Myasthenia gravis (MG) is based on a combination of various drugs. The acetylcholinesterase (AChE) inhibitors are used at the first stage of MG (e.g. pyridostigmine bromide) as a symptomatic treatment. These drugs are effective both in peripheral and central nervous system (cross blood-brain barrier – BBB). Their administration causes a huge amount of undesirable effects and it is necessary to reduce their dosage. The preparation, in vitro testing and structure-activity relationship (SAR) of novel AChE inhibitors will be done in our project. Novel compounds will be designed as the bispyridinium molecules with various functional groups and linkers. The bisquaternary structure should guarantee the minimal penetration through BBB and their peripheral effectiveness. SAR will be considered via experimental results (in vitro – IC₅₀) and quantitatively via computer programmes (QSAR). The peripheral AChE inhibitors suitable for application in vivo on animals and for further testing as relevant candidates for MG treatment should become the project results.

Development of novel antidotal treatment against organophosphorus pesticides

Musílek, K., Kuča, K., Pohanka, M., Žďárová Karasová, J., Marek, J.

Supported by the Ministry of Education, Youth and Sports, 2009–2012 (Project No.: ME09086)

The development of the broad-spectrum acetylcholinesterase reactivator against organophosphorus pesticides (OPP) is the main aim of the whole project. The synthesis and in vitro evaluation of novel or formerly prepared compounds will be used for this purpose. The structure-activity studies will be figured out for its determination. Such reactivator will be further tested in vivo and might become a candidate for the preclinical trials against OPP.

FARMAKO – Determination of important pharmacokinetic and biochemical parameters and evaluation of blood-brain barrier penetration using drugs introduced to Czech Army

Žďárová Karasová, J., Pohanka, M., Novotný, L., Kuča, K.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200811)

The aim of this project is to characterize pharmacokinetics of substances using in therapy by intoxications. Mainly their distribution in body tissues, in vitro and in vivo testing of ability to penetrate into central nervous system and their possibility to injury brain. At the same time we will evaluate some important biochemical data, which can be influenced by this therapy.

INDIKÁTOR II – Reverse detection of received ionizing radiation dose by monitoring of cell population changes using biophysical methods

Šinkorová, Z., Tóthová, I., Pejchal, J., Zárybnická, L., Kročová, Z., Österreicher, J.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200809)

To establish extrapolated calibration curve for determination the received dose in individuals exposed to ionizing radiation which could be practical used in the Czech army and to design the best enlistment of this biophysical method into the therapeutic-transfer system of the Czech army.

INHIBITOR – Novel inhibitors of acetylcholinesterase as prophylaxis of nerve agent poisonings

Musílek, K., Žďárová Karasová, J., Pohanka, M.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200805)

This project is focused on finding of suitable reversible acetylcholinesterase inhibitor as a replacement of prophylactic drug pyridostigmine. For this purpose, 100 reversible AChE inhibitors will be prepared, evaluated in vitro and compared with prophylactic drugs used in the Army of the Czech Republic. Regarding the structure-activity relationship, the best reversible AChE inhibitor will be determined and recommended for in vivo evaluation.

MORČE – Influence of the nerve agent and reactivators of acetylcholine esterase on the Guinea pig

Novotný, L., Žďárová Karasová, J., Kuča, K., Pohanka, M., Jun, D.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200905)

The aim of this project is determine the physiological activity of Acetyl Choline Esterase (AChE) and detection of LD50 of inhibitors paraoxon, tabun, cyklosarin and reactivators AChE pralidoxim, obidoxim, trimedoxim, HI-6, methoxim. Next task is asses protective effectively of reactivators. Also detection of AChE activity in organs after intoxication with nerve compound and following reactivation. We will also follow up plasmatic concentration of reactivatos in plasma after i.m. administration and morphological changes in the tissues.

ORCHIDS – Evaluation, optimisation, trialling and modelling procedures for mass casualty

Simpson, J., Kuča, K., Cabal, J.

Supported by the Executive Agency for Health and Consumers, 2008–2011 (Project No.: 100940)

The ORCHIDS project (Optimisation through Research of Chemical Incident Decontamination Systems) involves the evaluation of emergency decontamination methods, and the exercising and modelling of established mass casualty decontamination facilities. The project will deliver quantitative evidence on the optimum techniques for dealing with a range of potential contaminants and scenarios requiring emergency decontamination. A full range of issues will be addressed, from applied toxicological research to mass casualty decontamination exercising and modelling. This applied research will generate evidence-based guidelines on the optimum techniques for effective mass casualty decontamination, which will be disseminated by the project team through a network of EU Partners and stakeholders, which will be established and developed during the project. In addition, the project will consider the provision for minority and vulnerable groups in emergency decontamination, and will produce public information materials (leaflets and educational tools) designed to help increase knowledge, trust and confidence in emergency decontamination provision.

OTRAVA – Novel prophylactic antidotes of nerve agent poisonings based on scavengers

Jun, D., Musílek, K., Pohanka, M., Kuča, K.

Supported by the Czech Republic Ministry of Defence, 2009–2012 (Project No.: OVUOFVZ200902)

Organophosphorus compounds are weaponized in some countries as chemical warfare agents (sarin, tabun, VX). These compounds inhibit enzymes acetylcholinesterase and butyrylcholinesterase. As antidotes of poisonings by these compounds are often used anticholinergics (atropine, benactyzine) and cholinesterase reactivators (pralidoxime, obidoxime, HI-6). Favorable solution is using of specific enzymes (mostly cholinesterases) as scavengers, able to catch toxic organophosphorus compounds in the bloodstream before they start their toxic effect in the organism. We would like to find suitable cholinesterase reactivators, with the aim to suggest and test their combination with enzymes as pseudocatalytic bioscavenger. This combination allows increase prophylactic efficacy of administered enzyme.

PROTEIN – Biosensors for determination of nerve agents and yperites using recombinant proteins and nanotechnology

Pohanka, M., Žďárová Karasová, J., Musílek, K., Kassa, J., Kuča, K.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200807)

The proposed project is aimed at construction of enzyme based biosensors with immobilized ether cholinesterase and/or dehalogenase for detection of nerve agents and yperite using highly innovative nanotechnologies.

REAKTIVÁTOR – Robotized system for in vitro evaluation of novel reactivators of acetylcholinesterase inhibited by nerve agents

Cabal, J., Pohanka, M., Musílek, K., Kuča, K., Jun, D.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200801)

The aim of this project is to develop new robotic system based on sequential injection analysis (SIA) for testing of reactivation potency of newly synthesized antidotes against nerve agent poisonings.

RONSDOZ – Noninvasive measurement of proinflammatory markers of oxidative stress in irradiated as an indicator of received dose of radiation. Protective role of acetyl-L-carnitine

Vávrová, J., Řezáčová, M., Pejchal, J., Österreicher, J., Tichý, A.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200806)

To evaluate whether the bioindicators of oxidative and nitrative stress and inflammations of the airways can be used as biodosimetric markers after exposure to gamma radiation, after whole-body and partial irradiation of rats. To evaluate protective effect of acetyl-L-carnitine.

SUBSTANCE – Development of novel decontaminants and disinfectants of skin based on micellar compounds

Kuča, K., Novotný, L., Musílek, K., Pohanka, M., Jun, D., Cabal, J., Kassa, J.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200803)

The aim of this project is a development of new compound or mixture with a good decontaminant efficacy against wide spectrum of chemical warfare or pesticides. The second aim will be also to gain the universal disinfectant, which will be effective against many kinds of microbes.

The evaluation of potency acetylcholin-esterase reactivators to penetrate through the blood-brain barrier

Žďárová Karasová, J., Kuča, K., Novotný, L.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2010 (Project No.: NS9748)

A penetration of different acetylcho-linesterase reactivators through the blood-brain barrier will be studied. Firstly, the AChE reactivators will be assessed by means of a novel analytical method *in vitro*. Based on previous results, the promising reactivators for *in vivo* evaluation will be chosen on rat animal model (tribe Wistar). Finally, the time-course changes in levels of reactivators in plasma and central nervous system will be determined.

The role of virus associated cellular proteins in T-lymphocyte dysfunction

Boštík, P., Hubálek, M., Řehulka, P., Červený, L., Pejchal, J., Kročová, Z., Boštíková, V.

Supported by the Czech Republic Grant Agency, 2010–2014 (Project No.: GAP304/10/1161)

Herpetic viruses, such as VZV, and lentiviruses, such as HIV or SIV, are enveloped viruses, which infect CD4 T cells and cause transient (VZV) or progressive (SIV) dysregulation of T cell function. This effect is mainly indirect, as the fraction of infected cells is small, but the dysregulatory effect is observed in much larger cell population. These viruses incorporate host-derived proteins into their envelopes during the process of virus maturation and these proteins can either retain their function or engage their receptors and subsequently initiate intracellular signaling. This can be mediated by Akt-GSK3 pathway and PGE metabolism, leading to T cell dysfunction and apoptosis. This proposal utilizes state-of-the-art proteomic approach to identification of host cell proteins incorporated into the SIV and VZV virions. The role of these host cell proteins will be subsequently investigated in their effects on CD4 T cell signaling cascades and can therefore lead to the elucidation of mechanisms involved in CD4 T cell dysfunction and death in such diseases as chickenpox and AIDS.

YPERIT – Potential interference of toxic properties of sulphur mustard

Štětina, R., Svobodová, H.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200810)

The aim of this project is to estimate: 1) The influence of poly-(ADP ribose) polymerase (PARP) inhibitors on the cytotoxic and cytostatic effect of sulphur mustard. The influence of PARP inhibitors on the DNA repair (repair of cross-links) induced by SM will be studied in detail in mammalian and human cells. Both normal and DNA repair deficient mutant cells will be used. 2) The influence of selected antioxidants on the cytostatic effect of SM. The oxidative DNA damage and its relationship to the cytotoxicity will be studied. 3) The influence of combined treatment with PARP inhibitors and antioxidants on the cytostatic effect of SM.

COOPERATION

In 2010, the Department of Toxicology has continued in the cooperation with various research institutes (the National Poison Control Centre, Military Medical Academy, Belgrade – Republic of Serbia, Medicinal Science Division, Korea Research Institute of Chemical Technology, Daejeon – Korea, Institute for Medical Research and Occupational Health, Zagreb – Croatia, Department of Pharmacology and Therapeutics, Faculty of Medicine and Health Science, United Arab Emirates University, Al Ain – United Arab Emirates, Institute of Pharmacology and Toxicology of Federal Armed Forces Medical Academy Munich – Germany, TNO Prins Maurits Laboratory in Rijswijk – the Netherlands, Department of Toxicology of NBC Research Centre of Military Medical Academy in Sofia – Bulgaria, Centre de Recherches du Service de Santé des Armées /CRSSA/ Grenoble – France, University of Saint Andrew at Saint Andrew in Scotland) in the field of development of prophylactic and therapeutical means against nerve agents and organophosphorous insecticides. The cooperation has been mostly characterized by the exchange of scientific information. Within the frame of the work dealing with the identification of the mechanisms of chemoprevention in the initial phases of mutageneses and carcinogenesis, the Department of Toxicology has also continued in cooperation with the Department of Nutrition, Medical Faculty, University of Oslo (Norway) and the Institute of Experimental Oncology and the Slovak Medical University in Bratislava (Slovak Republic).

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The institute of Molecular Pathology, as one of the successors of the Institute of Radiobiology and Molecular Pathology, is a research centre focused on the application of advanced technologies of functional genomics to bio-medical defence research. Scientific work is preferably aimed at the studies of the host-pathogen interactions at the molecular level. The objectives of this research splits in three main topics: biomolecular signatures of biological agents potentially abused for the military, terroristic or bio-crime acts, intracellular fate of ingested microbes and finally the modulation of host cell signalling and gene expression by ongoing infection. The favourite microbial model is live vaccine strain of *Francisella tularensis*, a gram-negative facultative intracellular bacterial pathogen from the gamma subdivision of Proteobacteriae.

The second branch of the research involves the clinical studies utilizing the post-genomic approaches for identification of new biomarkers of different pathological processes or side effects of anti-tumor therapy.

Laboratories of the Institute are currently equipped for realization of complete classical and shotgun proteomic analyses. The materials for analyses are prepared in the Institute's tissue culture and microbiological labs. In parallel, the basic search for gene expression can be performed using quantitative real-time PCR technology. The established technologies enable researchers, Ph.D. students, and under-graduate students to realize complex studies oriented on the analyses of living system response to external (and internal, modulatory) signals encompassing the chemicals, biologically active bio-molecules, physical influences (temperature, radiation, etc.), and microorganisms.

During the year 2008 the Institute traditionally cooperated with the military medical and research facility in Sweden (FOI NBC-Defence, Umea) on preparation of *Francisella tularensis* knock-outs. The further scientific contacts involved National Center for Glycomics and Glycoproteomics, Department of Chemistry, Indiana University, USA – mass spectrometry analysis of bacterial glycoproteins, Unité de Pathogénie des Infections Systémiques, Faculté de Médecine, Necker-Enfants Malades, Paris, France – comparative proteomic studies of *Francisella tularensis* deletion mutants, Institute of Virology, Slovak Academy of Science, Bratislava, Slovak Republic – proteomic analysis of acetonitrile extracts of *Coxiella burnetii*, and, finally Institute of Molecular Systems Biology, IMSB, ETH Zurich – proteome analysis of outer membrane and lipid rafts component of host cells infected by *Francisella tularensis* and Department of Microbiology and Parasitology, University of Rijeka – microscopical analysis of microbial intracellular trafficking.

Within the frame of the Czech Republic, the Institute has useful contacts with the Institute of Microbiology, Czech Academy of Science, Prague, the

Institute of Parasitology, Czech Academy of Science, České Budějovice, the Faculty of Science, Charles University, Prague, the University Hospital in Hradec Králové, Department of Biological and Biochemical Science, University of Pardubice, Pardubice, Department of Pharmacology of Medical Faculty in Hradec Králové, Department of Oncological and Experimental Pathology Masaryk Memorial Cancer Institute, Brno and Veterinary Research Institute in Brno.

The financial support for research activities performed in the collaboration with above-mentioned Institutes comes from the programmes and projects of Czech Grant Agencies and Ministry of Defence. Currently, the Institute for Molecular Pathology has 12 full-time permanent employees, 9 scientists, 2 technicians and 1 administrative worker, two additional scientists have part-time positions and, finally, and 1 postdoc is supported from grant funds. The Institute has currently 12 PhD students and, furthermore, several undergraduates have been working on their diploma thesis in the Institute.

RESEARCH PROJECTS

Array technologies for BSL3 and BSL4 pathogens

Butaye, P., Sjostedt, A., Toman, R., Veljkovic, V., Stulík, J., Homan, W., Macela, A., Cassone, A.

Supported by EU COST Programme, 2005–2010 (Project No.: COST Action B28)

The main objective of the Action is to increase knowledge on BSL3 and BSL4 agents in order to support the development of more accurate diagnostics, vaccines and therapeutics, and to better understand epidemiology of these highly pathogenic micro-organisms that can be potentially used as biological weapons. The concrete scientific programme is focused on the identification of target genes or gene products for the development of specific diagnostic and characterization tools. Seventeen European countries together with Canada take part in this project and individual laboratories are divided according to applied technologies into five different workgroups – Flow cytometry and micro-array, Antigenicity, Proteomics and glycomics, Genomics and Microbiology.

BIODEFENCE – Classification of biological agents – support of an international project „Establishment and management of a common database of B-agents – A European Laboratory Biodefence Network

Hubálek, M., Kubelková, K., Macela, A., Hernychová, L.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200901)

The goal of the project is to gather typing data for B-agents listed in project of the European biological database by the mean of mass

spectrometry (MALDI-TOF, tandem mass spectrometry) and molecular biology (real-time PCR, MLST).

Development of new anti-tularemic vaccine on the basis of elucidation of molecular mechanism of tularemia pathogenesis

Stulík, J., Hubálek, M., Strašková, A., Macela, A., Červený, L., Kročová, Z.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2011 (Project No.: NS9747)

Project is focused on elucidation of tularemia pathogenesis using techniques of proteomics, genomics, molecular biology, immunology and microbiology. The main goal is to find genes encoding factors of virulence and based on this knowledge to create new prophylactic tools.

Development of proteomic methods for deeper quantitative analysis of plasma proteome

Lenčo, J.

Supported by the Czech Republic Grant Agency, 2009–2011 (Project No.: GP301/09/P241)

The increased availability of latest proteomic technologies has allowed proteomics to focus on biomarkers representing an especially important area. From the clinical viewpoint, the most promising source of such markers is plasma. However, plasma is characterized by serious obstacles for proteomic analysis, namely huge complexity and extremely wide protein concentration range. To overcome these hurdles, the general possible solutions include simplification of the mixture to specific peptides, and protein concentration equilibration. These approaches have been already published, however these are mostly iTRAQ-incompatible. iTRAQ is a unique and popular quantitative method for shotgun proteomics. Within the scope of the project, new iTRAQ-compatible proteomic techniques will be developed, namely the combination of iTRAQ with specific peptide isolation as well as with protein concentration equilibrating approaches. After optimization, these methods will be implemented into the quantitative analysis of plasma, focusing on markers for hypertrophic cardiomyopathy.

Differential proteome analysis of bacterial *Francisella tularensis* glyco- and phospho- proteins

Hernychová, L., Klimentová, J., Bílková, Z., Tichý, A., Balonová, L., Stulík, J.

Supported by the Ministry of Education, Youth and Sports, 2008–2010 (Project No.: ME08105)

Post-translational modifications (PTM) of proteins play crucial role in the assembly, degradation, structure, and function of expressed genes. PTM of proteins of bacterial pathogens strongly influence the nature of interaction with host cell system. However, little is known about the character and

function of such modifications for intracellular bacteria. The main objective of the project is focused on the analysis of *Francisella tularensis* proteins, their post-translational modifications as glycosylation and phosphorylation. The aim of the research is to describe their structure in context with pathogenicity and virulence of various subtypes of bacterial strains, differing in level of virulence. The strategy approach will be based on technologies that combine modern separation methods with mass spectrometry structure identification. The biofunctionalized magnetic nanoparticles with lectins, metal ions or specific mono(poly)clonal antibodies permit sufficient selectivity for glycosylated or phosphorylated.

FRANCIS – Development of new prophylactic tools against *Francisella tularensis* infection

Stulík, J., Dresler, J., Härtlová, A., Filipp, D., Lenčo, J., Link, M., Klimentová, J., Kročová, Z., Červený, L., Hubálek, M.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200808)

Identification of new candidate molecules of protein origin suitable for the construction of better defined live or subunit vaccines and elucidation of the process of antigen presentation of tularemic peptides as a key event for the development of new strategies to treat and prevent infection with *Francisella tularensis*.

Identification of biomarkers of intraamniotic infection and a syndrome of inflammatory fetus response in amniotic fluid: proteome approach

Lenčo, J., Kacerošský, M., Hubálek, M., Vlk, R., Andrýs, C., Calda, P., Drahošová, M., Tošner, J., Břešťák, M.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2011 (Project No.: NS10382)

Intraamniotic infection belongs to the most frequent causes of abortion. This infection can even lead to fetal inflammatory response syndrome that is accompanied by increased perinatal morbidity and mortality. Primary goal of this project is the characterization of protein composition of amniotic fluid in patients with preterm premature rupture of membranes (PPROM) with or without intraamniotic infection, or with FIRS. The identified proteins could be useful as biomarkers for diagnosis of FIRS or intraamniotic infection in future. Another aim involves monitoring of differences in quantities of IL-8 and matrix metalloproteinase 8 (MMP-8) in amniotic fluid of patients with PPRM with or without intraamniotic infection, or with FIRS.

INDIKÁTOR II – Reverse detection of received ionizing radiation dose by monitoring of cell population changes using biophysical methods

Šinkorová, Z., Tóthová, I., Pejchal, J., Zárybnická, L., Kročová, Z., Österreicher, J.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200809)

To establish extrapolated calibration curve for determination the received dose in individuals exposed to ionizing radiation which could be practical used in the Czech army and to design the best enlistment of this biophysical method into the therapeutic-transfer system of the Czech army.

Molecular diagnostics of bacterial antigens

Krátká, J., Hernychová, L., Novák, P., Man, P., Šimšová, M.

Supported by , 2009–2013 (Project No.: FR-T11/292)

The main goal of the proposal is to create new unbiased and fully reliable detection system for pathogenic bacteria e.g. *F. tularensis*. Basic research, aimed at identification of diagnostic protein markers, will be followed by experimental and applied research which will target recombinant forms of protein markers and production of highly specific antibodies. Finally the overall methodology and protein and antibody products will be utilized in creation of novel detection systems.

New analytical approaches for identification of proteins with significant attributes for virulence and pathogenicity of bacteria

Bílková, Z., Hernychová, L., Kučerová, Z., Horák, D.

Supported by the Czech Republic Grant Agency, 2009–2011 (Project No.: GA203/09/0857)

The project aims at the innovative analytical approach based on biofunctionalized magnetic micro/nanoparticles combined with microfluidic analytical device (m-TAS). Benefits provided by both systems open the feasibility to use this microanalyzer for effective separation of bacterial proteins from highly complex mixture. The analyses will be focused on significant attributes of virulence and pathogenesis within intracellular parasite. New analytical strategy combined with mass spectrometry (MS) enables to isolate and characterize the structure of low-abundant glykoproteins, phosphoproteins and in other way modified proteins from cell lysate or membrane fractions of bacteria and identify biomolecules predicting the virulence of bacteria strains. The immobilized magnetic affinity reactor (IMAR) with specific ligand used for isolation and purification of proteins significantly facilitates the identification of protein fingerprint by MS even for bacterial protein in submicromolar concentration.

Proteome analysis of extracytoplasmic stress response in *Francisella tularensis* strain with different virulence

Stulík, J.

Supported by the Ministry of Education, Youth and Sports, 2007–2010 (Project No.: OC 151)

Proteome analysis of extracytoplasmatic stress response in cell membrane of intracellular pathogen *Francisella tularensis*.

Proteomic identification of biomarkers of intraamniotic inflammation in amniotic fluid in preterm birth patients

Kacerovský, M., Lenčo, J.

Supported by the Ministry of Education, Youth and Sports, 2010–2012 (Project No.: ME10025)

Intraamniotic infection and inflammation belong among the major causes of preterm birth and may lead to fetal inflammatory response syndrome (FIRS) which is associated with elevated perinatal morbidity and mortality independently on the gestational age. The aim of the project is to characterize alterations in amniotic fluid protein composition in women with spontaneous preterm birth at gestational age 24+0 to 36+6 with and without confirmed intraamniotic infection and inflammation or FIRS. Such proteins may be used for diagnostic applications in the future.

The proposal of workflow of unambiguous identification of the complex of highly virulent bacterial biological agents using mass spectrometry and molecular biology methods and testing their feasibility on environmental samples

Dresler, J., Hubálek, M.

Supported by the Czech Republic Ministry of Defence, 2010–2012 (Project No.: OVUVZU2010001)

The aim of the proposed project is to design functional identification systems based on Real-time PCR that can be used in the field with lower cost than current systems. In parallel, the goal is to design typing methods suitable for military forensic laboratory that will help in discovery of the source of the infection and substantially extend the diagnostic abilities of Czech army in the scope of identification of highly hazardous biological agents. Modern molecular methods based on principle of DNA and protein analysis will be employed, sequencing of nucleic acids and tandem mass spectrometry. The resulted data will be stored in the database of identification and typing data of biological agents that is formed in BioNumerics software as part of BIODEFENCE project. The potential of the investigated methods and procedures will be tested using simulated environmental samples.

The proteomics-based study on molecular mechanisms of early lymph node metastases formation in low grade breast cancer

Bouchal, P., Hubálek, M., Vojtěšek, B.

Supported by the Czech Republic Grant Agency, 2010–2012 (Project No.: GAP304/10/0868)

Metastasis, the spread of breast cancer to other locations in the body, is the main reason that leads to the mortality of patients with this diagnosis. This project is focused on discovery, verification and validation of proteins related to metastatic processes in breast cancer in small, low grade breast cancer tumors which, in disagreement with theoretical prognosis, start with metastases formation early and exhibit lymph node metastases. Clinically well defined set of primary breast tumor tissues has been selected for this purpose. Target proteins will be identified by a combination of complementary high resolution proteomic methods with various analysis principles and validated at different biological levels. Furthermore, molecular roles of targets identified in our preliminary experiments will be studied by the use of different proteomic and genomic approaches in detail. We expect that our results will help to describe the molecular mechanisms of metastasis in this group of clinically significant tumors and can identify potential markers of their metastatic potential.

The role of virus associated cellular proteins in T-lymphocyte dysfunction

Boštík, P., Hubálek, M., Řehulka, P., Červený, L., Pejchal, J., Kročová, Z., Bošťíková, V.

Supported by the Czech Republic Grant Agency, 2010–2014 (Project No.: GAP304/10/1161)

Herpetic viruses, such as VZV, and lentiviruses, such as HIV or SIV, are enveloped viruses, which infect CD4 T cells and cause transient (VZV) or progressive (SIV) dysregulation of T cell function. This effect is mainly indirect, as the fraction of infected cells is small, but the dysregulatory effect is observed in much larger cell population. These viruses incorporate host-derived proteins into their envelopes during the process of virus maturation and these proteins can either retain their function or engage their receptors and subsequently initiate intracellular signaling. This can be mediated by Akt-GSK3 pathway and PGE metabolism, leading to T cell dysfunction and apoptosis. This proposal utilizes state-of the art proteomic approach to Identification of host cell proteins incorporated into the SIV and VZV virions. The role of these host cell proteins will be subsequently investigated in their effects on CD4 T cell signaling cascades and can therefore lead to the elucidation of mechanisms involved in CD4 T cell dysfunction and death in such diseases as chickenpox and AIDS.

Proteomic identification of biomarkers of intraamniotic inflammation in amniotic fluid in preterm birth patients

KaceroVský, M., Lenčo, J.

Supported by the Ministry of Education, Youth and Sports, 2010–2012 (Project No.: ME10025)

Intraamniotic infection and inflammation belong among the major causes of preterm birth and may lead to fetal inflammatory response syndrome (FIRS) which is associated with elevated perinatal morbidity and mortality independently on the gestational age. The aim of the project is to characterize alterations in amniotic fluid protein composition in women with spontaneous preterm birth at gestational age 24+0 to 36+6 with and without confirmed intraamniotic infection and inflammation or FIRS. Such proteins may be used for diagnostic applications in the future.

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The vivarium at the Faculty of Military Health Sciences of the University of Defence fulfils science, research and teaching tasks of the departments and specialized workplaces of the Faculty of Military Health Sciences. The vivarium is subordinated to the Department of Teaching activities.

The separate vivarium for mice and sewer-rats is a part of the Department of Toxicology.

From the point of view of the capacity the Faculty of Military Health Sciences is able to carry out experiments, place and take care of laboratory mice, sewer-rats, guinea-pigs, rabbits, pigs or mini pigs and sheep. In the area of the vivarium there are also laboratory workplaces and operating theatres, which are equipped for experiments on laboratory animals. All studies have to be allowed by the Ethical Board of the Faculty of the Military Health Sciences fully in compliance with the legal standards of the protection against cruelty to animals.

The vivarium with the operating block is intensively used above all for experiments on large experimental animals. The courses BATLS and BARTS are held there. During the courses different model situations and cases of emergency medicine are performed for military doctors and participants of foreign mission including war injuries on dead and live experimental animals.

The international course led by U.S. ARMY medical service personnel and other similar training activities belong to this part.

On 4 November 2008 the vivarium was accredited for use again for 5 years (till 4 November 2013) by the Central Board for Animal Protection and

for 5 years (till 4 November 2013) as a breeding institution. The Faculty of Military Health Sciences also owns the refreshed certificate of the Ministry of

Health for testing pharmaceuticals valid until 31 December 2010. Nowadays, the Faculty of Military Health Sciences does not have its own certificate of right laboratory practice given by the State Institute for Drugs.

The above-mentioned range of the activities shows that it is necessary to time work and also co-ordinate it personally including permanent presence of a veterinary surgeon, veterinary technicians and breeders of laboratory animals.

RESEARCH PROJECTS

FARMAKO – Determination of important pharmacokinetic and biochemical parameters and evaluation of blood-brain barrier penetration using drugs introduced to Czech Army

Žďárová Karasová, J., Pohanka, M., Novotný, L., Kuča, K.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200811)

The aim of this project is to characterize pharmacokinetics of substances using in therapy by intoxications. Mainly their distribution in body tissues, in vitro and in vivo testing of ability to penetrate into central nervous system and their possibility to injury brain. At the same time we will evaluate some important biochemical data, which can be influenced by this therapy.

MORČE – Influence of the nerve agent and reactivators of acetylcholine esterase on the Guinea pig

Novotný, L., Žďárová Karasová, J., Kuča, K., Pohanka, M., Jun, D.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200905)

The aim of this project is determine the physiological activity of Acetyl Choline Esterase (AChE) and detection of LD50 of inhibitors paraoxon, tabun, cyklosarine and reactivators AChE pralidoxim, obidoxim, trimedoxim, HI-6, methoxim. Next task is asses protective effectively of reactivators. Also detection of AChE activity in organs after intoxication with nerve compound and following reactivation. We will also follow up plasmatic concentration of reactivatos in plasma after i.m. administration and morphological changes in the tissues.

NOTES – Surgical treatment of the digestive tube's penetrating injuries using Natural Orifice Transluminal Endoscopic Surgery

Klein, L., Ferko, A., Šubrt, Z., Novotný, L., Páral, J., Dušek, T., Lochman, P.

Supported by the Czech Republic Ministry of Defence, 2009–2011 (Project No.: OVUOFVZ200903)

The project is focused on creating the non-devastating penetrating injury model of the digestive tube and testing the possibility for application of the NOTES technology in the treatment. The method uses natural body's orifice (mouth, vagina, urethra, anus) for intraluminal installation of the double channel operating endoscope into the targeted digestive tube's organ. Through its wall it is put into the free abdominal cavity. Our hypothesis supposes using this method itself or in combination with laparoscopic technique for traumatic defect's closure in the wall without laparotomy. Project will be provided in the porcine model. Animals will be observed for the period of two weeks, and after euthanasia they will be obducted for detection of postoperative complications.

SUBSTANCE – Development of novel decontaminants and disinfectants of skin based on micellar compounds

Kuča, K., Novotný, L., Musílek, K., Pohanka, M., Jun, D., Cabal, J., Kassa, J.

Supported by the Czech Republic Ministry of Defence, 2008–2011 (Project No.: OVUOFVZ200803)

The aim of this project is a development of new compound or mixture with a good decontaminant efficacy against wide spectrum of chemical warfare or pesticides. The second aim will be also to gain the universal disinfectant, which will be effective against many kinds of microbes.

The evaluation of potency acetylcholin-esterase reactivators to penetrate through the blood-brain barrier

Žďárová Karasová, J., Kuča, K., Novotný, L.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2009–2010 (Project No.: NS9748)

A penetration of different acetylcho-linesterase reactivators through the blood-brain barrier will be studied. Firstly, the AChE reactivators will be assessed by means of a novel analytical method *in vitro*. Based on previous results, the promising reactivators for *in vivo* evaluation will be chosen on rat animal model (tribe Wistar). Finally, the time-course changes in levels of reactivators in plasma and central nervous system will be determined.

VISITORS TO THE FACULTY OF MILITARY HEALTH SCIENCES

France

- FOUREAU Mathilde (Rouen) – a French teacher,
01 October 2010 – 30 June 2011
- GAUDRAY Elliot, RASSAT Robin (Lyon) – an exchange stay of students
from the Military Medical Academy in Lyon,
13 November 2010 – 26 November 2010
- BRUNEL Lucile (Lyon) – a French teacher,
01 January 2010 – 30 June 2010

Serbia

- Assist. Prof. Dr. JACEVIC Vesna, DVM, Ph.D., ZLATKOVIC Milica, MSc.
(Belgrade) – Working residency,
01 November 2010 – 12 November 2010

VISITS ABROAD

Australia

- Balonová, L. (HUPO 2010, Sydney,
18 September 2010 – 24 September 2010)
- Fučíková, A. (HUPO 2010, Sydney,
18 September 2010 – 24 September 2010)
- Hernychová, L. (HUPO 2010, Sydney,
18 September 2010 – 24 September 2010)

Austria

- Fučíková, A. (Late Summer Practical Proteomics Seminar, Vienna,
05 September 2010 – 08 September 2010)
- Hubálek, M. (Progress Meeting of B-0060-ESM4-GC (EDA), Vienna,
07 November 2010 – 09 November 2010)
- Jebavý, L. (36th Annual Meeting of the Europe Group for Blood and
Marrow Transplantation, Vienna, 20 March 2010 – 24 March 2010)

VISITS ABROAD

Belgium

- Kassa, J. (31th NATO CBRN Medical Working Group Meeting, Brussels, 31 January 2010 – 05 February 2010)
- Musílek, K. (21st International Symposium on Medicinal Chemistry, Brussels, 05 September 2010 – 09 September 2010)
- Smetana, J. (European Rotavirus Academy, Brussels, 13 October 2010 – 15 October 2010)
- Šubrt, Z. (ISICEM Congress, Brussels, 08 March 2010 – 12 March 2010)

Bulgaria

- Chlíbek, R. (12th Central European Vaccination Advisory Group Meeting, Sofia, 20 May 2010 – 22 May 2010)

Canada

- Hlúbik, P. (23rd Scientific Meeting of the International Society of Hypertension, Vancouver, 24 September 2010 – 30 September 2010)
- Střítecká, H. (23rd Scientific Meeting of the International Society of Hypertension, Vancouver, 24 September 2010 – 30 September 2010)

Croatia

- Lochman, P. (3rd Central European Congress of Surgery, Dubrovnik, 28 April 2010 – 01 May 2010)

Denmark

- Kuča, K. (16th World Congress on Basic and Clinical Pharmacology – World Pharma 2010, Copenhagen, 17 July 2010 – 23 July 2010)
- Špidlová, P. (EMBO Practical Phosphoproteomic Course, Odense, 28 March 2010 – 02 April 2010)
- Žďárová Karasová, J. (16th World Congress on Basic and Clinical Pharmacology – World Pharma 2010, Copenhagen, 17 July 2010 – 23 July 2010)

France

- Dobeš, D. (MEET 2010, Marseille, 16 June 2010 – 20 June 2010)
- Chlíbek, R. (4th Global Pertussis Initiative Regional Roundtable Meeting, Paris, 13 April 2010 – 15 April 2010)
- Chlíbek, R. (28th European Society for Paediatric Infectious Diseases, Nice, 03 May 2010 – 08 May 2010)
- Klein, L. (Workshop of the Working Group for Burns Treatment NATO – RTO HFM, Paris, 24 March 2010 – 26 March 2010)
- Kuča, K. (Perspectives in Percutaneous Penetration, La Grande Motte, 06 April 2010 – 10 April 2010)

- Smetana, J. (28th European Society for Paediatric Infectious Diseases, Nice, 03 May 2010 – 08 May 2010)
- Zárýbnická, L. (The European Dosimetry Conference, Mandelieu-La-Napoule France, 09 October 2010 – 15 October 2010)

Germany

- Haman, L. (9th Atrial Fibrillation Symposium, Berlin, 17 March 2010 – 19 March 2010)
- Chlíbek, R. (25th HFM Panel Bussines Meeting, Essen, 18 April 2010 – 23 April 2010)
- Lochman, P. (8th World Congress on Trauma, Shock, Inflammation and Sepsis – TSIS 2010, Munich, 09 March 2010 – 14 March 2010)
- Pavlík, V. (Medical course, Oberammergau, 01 November 2010 – 05 November 2010)
- Sheshko, V. (Screening of DNA Library of Francisella tularensis (IVIAT), Munich, 24 October 2010 – 04 November 2010)
- Střítecká, H. (78th Congress of the European Atherosclerosis Society, Hamburg, 20 June 2010 – 23 June 2010)
- Střítecká, H. (18 CME credit hours, Hamburg, 20 June 2010 – 23 June 2010)
- Šmejkal, K. (AO Expertrs' Symposium, Mainz, 30 September 2010 – 02 October 2010)

Hungary

- Chlíbek, R. (13th Central European Vaccination Advisory Group meeting (CEVAG), Budapest, 28 October 2010 – 30 October 2010)
- Žďárová Karasová, J. (NRF CBRN JAT, Budapest, 18 October 2010 – 22 October 2010)

China

- Boštík, P. (1st Annual World Congress of Immunodiseases and Therapy, Beijing, 15 May 2010 – 17 May 2010)

Israel

- Horáček, J. (33rd World Congress of the International Society of Hematology (ISH), Jerusalem, 08 October 2010 – 14 October 2010)
- Chlíbek, R. (7th International Symposium on Penumococcal and Pneumococcal Diseases, Tel Aviv, 14 March 2010 – 19 March 2010)

VISITS ABROAD

Italy

- Páral, J. (14th Conference of the European Society of Surgery (ESS), Turin, 24 November 2010 – 27 November 2010)
- Žďárová Karasová, J. (NRF CBRN JAT, Naples, 01 December 2010 – 17 December 2010)

Japan

- Zárybnická, L. (14th International Congress of Immunology, Kobe, 20 August 2010 – 28 August 2010)

Lithuania

- Chlíbek, R. (4th International Course on Paediatric Infectious Diseases, Vilnius, 06 October 2010 – 09 October 2010)

Mongolia

- Boštíková, V. (Collaboration VZV project, Ulaanbaatar, 20 June 2010 – 26 June 2010)
- Boštíková, V. (Identification and Strain Surveillance for Clinical Isolates of VYV in Czech Republic Using Molecular Genetics Methods, Ulaanbaatar, 25 June 2010 – 25 June 2010)

Norway

- Páral, J. (22nd International Conference of the Society for Medical Innovation and Technology (SMIT), Trondheim, 02 September 2010 – 05 September 2010)
- Svobodová, H. (Working Residency at the Department of Nutrition, University of Oslo, Oslo, 14 November 2010 – 20 November 2010)
- Štětina, R. (FEMS Oslo Meeting, Oslo, 12 September 2010 – 18 September 2010)

Poland

- Härtlová, A. (EMBO Meeting. At the joint edge of Cellular Microbiology and Cell Biology, Krakow, 09 October 2010 – 14 October 2010)
- Strašková, A. (EMBO Meeting. At the joint edge of Cellular Microbiology and Cell Biology, Krakow, 09 October 2010 – 14 October 2010)

Portugal

- Horáček, J. (16th ESH-EHA Hematology Tutorial, Focus on Acute Malignancies, Cascais, 04 November 2010 – 08 November 2010)
- Klimentová, J. (4th EuPA Meeting, 6th ProCura Meeting, Estoril, 23 October 2010 – 27 December 2010)
- Link, M. (4th EuPA Meeting, 6th ProCura Meeting, Estoril, 23 October 2010 – 27 October 2010)

- Matoušek, R. (Resuscitation 2010 – Congress ERC (European Resuscitation Council), Porto, 02 December 2010 – 04 December 2010)
- Vaněk, J. (The 3rd WSEAS International Conference on Visualization, Imaging and Simulation (VIS '10), Faro, 02 November 2010 – 06 November 2010)

Serbia

- Vilasová, Z. (NATO Mission KFOR, Kosovo, 18 February 2010 – 08 August 2010)

Slovakia

- Frank, M. (13th Slovak Meeting of Trauma, Tále, 22 April 2010 – 24 April 2010)
- Halajčuk, T. (Disaster Medicine 2010, Častá – Papiernička, 08 June 2010 – 10 June 2010)
- Hubálek, M. (25th Annual Congress of Czech-Slovak Microbiological Society, Stará Lesná, 15 September 2010 – 19 September 2010)
- Chlíbek, R. (HPV – Yesterday, Today and Tomorrow, Vyhne, 19 March 2010 – 20 March 2010)
- Chlíbek, R. (Immunity in the Context of Clinical Data, HPV Vaccines, High Tatras, 26 March 2010 – 28 March 2010)
- Chlíbek, R. (Vaccination During Pregnancy, Štrbské Pleso, 14 January 2010 – 16 January 2010)
- Chlíbek, R. (New Strategies in Vaccination Against Pertussis, Vyhne, 19 March 2010 – 20 March 2010)
- Chlíbek, R. (HPV – Yesterday, Today and Tomorrow, Košice, 05 March 2010 – 06 March 2010)
- Chlíbek, R. (New Strategies in Vaccination Against Pertussis, Košice, 05 March 2010 – 06 March 2010)
- Chlíbek, R. (New Strategies in Vaccination Against Pertussis, Piešťany, 19 February 2010 – 20 February 2010)
- Chlíbek, R. (HPV – Yesterday, Today and Tomorrow, Piešťany, 19 February 2010 – 20 February 2010)
- Kassa, J. (TOXCON 2010: Borderless Toxicology Meeting, Stará Lesná, 08 September 2010 – 10 September 2010)
- Kuča, K. (15th Interdisciplinary Toxicological Conference, Stara Lesna, 06 September 2010 – 10 September 2010)
- Pohanka, M. (Toxcon 2010 (15th Interdisciplinary Toxicological Conference), Stará Lesná, 06 September 2010 – 10 September 2010)
- Svobodová, H. (EU-US Workshop, Smolenice, 23 May 2010 – 27 May 2010)

VISITS ABROAD

- Štětina, R. (EU-US Workshop, Smolenice, 23 May 2010 – 27 May 2010)

Spain

- Horáček, J. (15th Congress of the European Hematology Association (EHA), Barcelona, 09 June 2010 – 14 June 2010)
- Chlíbek, R. (European Monitor and Investigator Meeting, Madrid, 14 June 2010 – 16 June 2010)
- Chlíbek, R. (Pneumococcal Conjugate Vaccines Summit, Barcelona, 18 November 2010 – 20 November 2010)
- Musílek, K. (12th International Congress of Toxicology, Barcelona, 19 July 2010 – 23 July 2010)
- Pohanka, M. (12th International Congress of Toxicology, Barcelona, 19 July 2010 – 23 July 2010)
- Smetana, J. (Investigator Meeting, Madrid, 14 June 2010 – 16 June 2010)
- Svobodová, H. (12th International Congress of Toxicology, Barcelona, 19 July 2010 – 23 July 2010)
- Štětina, R. (12th International Congress of Toxicology, Barcelona, 19 July 2010 – 23 July 2010)

Sweden

- Cabal, J. (ORCHIS Project Meeting, Umea, 13 June 2010 – 15 June 2010)
- Dobeš, D. (Visiting Vascular Surgeon, Malmö, 07 November 2010 – 13 November 2010)
- Fajfrová, J. (ICO 2010, Stockholm, 11 July 2010 – 15 July 2010)
- Hlúbik, P. (ICO 2010, Stockholm, 11 July 2010 – 15 July 2010)
- Hubálek, M. (CBW Protection Symposium, Stockholm, 07 June 2010 – 11 June 2010)
- Kuča, K. (Fifth ORCHIDS Project Meeting, Umea, 11 June 2010 – 13 June 2010)
- Kuča, K. (The 10th International Symposium on Protection against Chemical and Biological Warfare Agent, Stockholm, 08 June 2010 – 11 June 2010)
- Pavlík, V. (ICO 2010, Stockholm, 11 July 2010 – 15 July 2010)
- Soukup, O. (Testing compounds, Goteborg, 07 April 2010 – 07 May 2010)
- Střítecká, H. (ICO 2010, Stockholm, 11 July 2010 – 15 July 2010)

Switzerland

- Bajgar, J. (8th International Chemical and Biological Medical Treatment Symposium (VIII CBMTS), Spiez, 02 May 2010 – 07 May 2010)

- Fučíková, A. (Scientific Internship in Order to Get Knowledges about a New Proteomic Techniques Available for Biomarker Discovery, Institute of molecular systems biology, Zurich, 17 April 2010 – 10 July 2010)
- Fusek, J. (8th International Chemical and Biological Medical Treatment Symposium (VIII CBMTS), Spiez, 02 May 2010 – 07 May 2010)
- Härtlová, A. (Institute of Molecular and Systems Biology, Zurich, 01 June 2010 – 30 June 2010)
- Kassa, J. (8th International Chemical and Biological Medical Treatment Symposium (VIII CBMTS), Spiez, 02 May 2010 – 07 May 2010)
- Lochman, P. (Annual Congress of European Society for Surgical Research, Geneva, 09 June 2010 – 12 June 2010)
- Musílek, K. (8th International Chemical and Biological Medical Treatment Symposium (VIII CBMTS), Spiez, 02 May 2010 – 07 May 2010)
- Šmejkal, K. (AO Trauma Course – Masters, Davos, 11 December 2010 – 18 January 2011)

The Netherlands

- Dobeš, D. (Annual Meeting, Amsterdam, 15 September 2010 – 20 September 2010)

Turkey

- Balonová, L. (8th Management Committee and WG1, WG2, WG3, WG4 and WG5 meetings of COST Action B28 Array Technologies for BSL3 and BSL4 Pathogens, Istanbul, 03 May 2010 – 06 May 2010)
- Červený, L. (Conference COST B28 Action, Istanbul, 03 May 2010 – 05 May 2010)
- Härtlová, A. (8th Management Committee and WG1, WG2, WG3, WG4 and WG5 meetings of COST Action B28 Array Technologies for BSL3 and BSL4 Pathogens, Istanbul, 03 May 2010 – 05 May 2010)
- Klein, L. (15th Meeting of the International Society for Burn Injuries (ISBI), Istanbul, 21 June 2010 – 25 June 2010)
- Klein, L. (16th Congress of the Mediterranean Council for Burns and Fire Disasters, Istanbul, 31 March 2010 – 03 April 2010)
- Strašková, A. (COST Action B28, Istanbul, 03 May 2010 – 05 May 2010)
- Špidlová, P. (Conference COST B28 Action, Istanbul, 03 May 2010 – 06 May 2010)

United Arab Emirates

- Hlúbik, P. (2nd International Conference on Drug discovery and therapy, Dubai, 01 February 2010 – 04 February 2010)

VISITS ABROAD

- Střítecká, H. (2nd International Conference on Drug discovery and therapy, Dubai, 01 February 2010 – 04 February 2010)

United Kingdom

- Balonová, L. (UK/Czech Francisella tularensis Collaborative Meeting, Salisbury, 12 October 2010 – 12 October 2010)
- Klein, L. (2nd Birmingham International Burn Congress, Birmingham, 05 September 2010 – 07 September 2010)
- Kuča, K. (Orchids Workshop, Porton Down, 15 November 2010 – 18 November 2010)

United States

- Bajgar, J. (Chemical and Biological Defense Science and Technology Conference, Orlando, 15 November 2010 – 19 November 2010)
- Bajgar, J. (17th Biennial Medical Chemical Defense Bioscience Review (Bioscience Review 2010), Hunt Valley, 23 May 2010 – 27 May 2010)
- Balonová, L. (Analysis of Phosphoproteome in Pathogenic Bacterium Francisella tularensis, Bloomington, 01 November 2010 – 19 November 2010)
- Boštík, P. (Department of Pathology and Lab Medicine, Atlanta, 08 November 2010 – 17 November 2010)
- Boštíková, V. (The New Policy in Calendar of Vaccination of Adults in Central European Countries, Atlanta, 19 November 2010 – 19 November 2010)
- Boštíková, V. (21st Annual Conference on Hot Topics in Primary Care Medicine, Maui, 12 November 2010 – 12 November 2010)
- Boštíková, V. (Collaboration VZV Project, Atlanta, 15 November 2010 – 26 November 2010)
- Boštíková, V. (VZV Project, Atlanta, 22 November 2010 – 22 November 2010)
- Boštíková, V. (Whole Genome Sequencing of VZV, Atlanta, 22 November 2010 – 22 November 2010)
- Boštíková, V. (Epidemiology of Frequently Emerging Zoonosis in Europe, Atlanta, 18 November 2010 – 18 November 2010)
- Boštíková, V. (Focus on VZV Vaccination in Czech Republic and Other European Countries, Atlanta, 19 November 2010 – 19 November 2010)
- Haman, L. (Heart Rhythm 2010, Denver, 10 May 2010 – 15 May 2010)
- Horáček, J. (52th Annual Meeting and Exposition of American Society of Hematology (ASH), Orlando, 02 December 2010 – 09 December 2010)

- Chlíbek, R. (50th Annual Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC), Boston, 11 September 2010 – 16 September 2010)
- Kassa, J. (17th Biennial Medical Chemical Defense Bioscience Review (Bioscience Review 2010), Hunt Valley, 23 May 2010 – 27 May 2010)
- Kassa, J. (Chemical and Biological Defense Science and Technology Conference, Orlando, 15 November 2010 – 19 November 2010)
- Kubelková, K. (IL-23 and IL-17 in vaccine-induced protection to intracellular bacteria, Washington DC, 01 April 2010 – 30 September 2011)
- Kuča, K. (Chemical and Biological Defense Science and Technology Conference, Orlando, 15 November 2010 – 19 November 2010)
- Kuča, K. (17th Biennial Medical Chemical Defense Bioscience Review, Hunt Valley, 23 May 2010 – 27 May 2010)
- Kuča, K. (4th National Bio-Threat Conference, New Orleans, 07 December 2010 – 10 December 2010)
- Musílek, K. (17th Biennial Medical Chemical Defense Bioscience Review (Bioscience Review 2010), Hunt Valley, 23 May 2010 – 27 May 2010)
- Musílek, K. (Chemical and Biological Defense Science and Technology Conference, Orlando, 15 November 2010 – 19 November 2010)
- Musílek, K. (ACS Fall Meeting, Boston, 22 August 2010 – 27 August 2010)
- Pohanka, M. (17th Biennial Medical Chemical Defense Bioscience Review (Bioscience Review 2010), Hunt Valley, 23 May 2010 – 27 May 2010)
- Pohanka, M. (Chemical and Biological Defense Science and Technology Conference, Orlando, 15 November 2010 – 19 November 2010)
- Pohanka, M. (4th National Bio-Threat Conference, New Orleans, 07 December 2010 – 10 December 2010)
- Řehulka, P. (Analysis of Phosphoproteome in Pathogenic Bacterium *Francisella tularensis*, Bloomington, 11 October 2010 – 05 November 2010)
- Smetana, J. (ICID, Miami, 08 March 2010 – 13 March 2010)
- Smetana, J. (ICAAC, Boston, 11 September 2010 – 16 September 2010)
- Soukup, O. (Conference-poster, San Diego, 12 November 2010 – 18 November 2010)
- Špliňo, M. (The New Policy in Calendar of Vaccination of Adults in Central European Countries, Atlanta, 19 November 2010 – 19 November 2010)

VISITS ABROAD

- Špliňo, M. (McBryan's Seminars – Molecular Variability among Distinct Isolates of VZV from Czech Republic, Atlanta, 22 November 2010 – 22 November 2010)
- Špliňo, M. (21st Annual Conference on Hot Topics in Primary Care Medicine, Maui, 12 November 2010 – 12 November 2010)
- Špliňo, M. (Epidemiology Frequently Emerging Zoonosis in Europe, Atlanta, 18 November 2010 – 18 November 2010)
- Tichý, A. (Study of phosphopeptide enrichment from complex mixtures. Detection of phosphopeptides by mass spektrometry MALDI-TOF/MS and LTQ-FT. Operating mass spectrometer 4800 (Applied Biosystems), Bloomington, 11 October 2010 – 04 November 2010)
- Vaněk, J. (IEEE Visualization 2010, Salt Lake City, 23 October 2010 – 31 October 2010)
- Žďárová Karasová, J. (17th Biennial Medical Chemical Defense Bioscience Review (Bioscience Review 2010), Hunt Halley, 23 May 2010 – 27 May 2010)
- Žďárová Karasová, J. (Chemical and Biological Defense Science and Technology Conference, Orlando, 15 November 2010 – 19 November 2010)
- Žďárová Karasová, J. (240th ACS National Meeting and Exposition, Boston, 22 August 2010 – 26 August 2010)

COURSES, RESIDENCIES AT THE FACULTY IN 2010

Military Hygiene

- Refresher course – teachings about foodstaf, 22 November 2010 – 26 November 2010
- Basic course – hygienic support to missions, 22 March 2010 – 25 March 2010
- Basic course – safety and health protection at work, 11 October 2010 – 15 October 2010

Radiobiology

- Basic CBRN course for Police of the Czech Republic, 30 November 2010 – 03 December 2010

Language Courses

- Intensive language course – English (STANAG 2), 07 September 2009 – 22 January 2010, 11 January 2010 – 21 May 2010, 18 January 2010 – 28 May 2010, 25 January 2010 – 04 June 2010, 13 September 2010 – 28 January 2011
- Refresher language courses – English (STANAG 2), 08 March 2010 – 30 April 2011, 22 March 2010 – 07 May 2011, 04 October 2010 – 24 November 2010, 25 October 2010 – 03 December 2010
- Combined language courses – English (STANAG 3), 14 September 2009 – 04 June 2010, 13 September 2010 – 27 May 2011
- Medical English conversation course, 18 January 2010 – 29 January 2010
- Combined language courses – French (STANAG 2), 13 September 2010 – 10 June 2011
- Combined language courses – French (STANAG 1), 12 September 2009 – 11 June 2010
- Combined language courses – English (STANAG 2), 06 September 2010 – 03 June 2011, 07 September 2009 – 03 June 2010

Military Medical Service Organization

- Specialized warrent officer's course for nurses, 29 March 2010 – 18 June 2010, 29 September 2010 – 17 December 2010
- Senior staff officer combined course, 13 September 2010 – 22 June 2012
- Refresher course of aeromedical evacuation, 13 April 2010 – 15 April 2010

COURSES, RESIDENCIES

Military Epidemiology

- Refresher course – basis in tropical and travel medicine focused on Afrika, 23 March 2009 – 24 April 2010
- Refresher course – biological agents, epidemiological protection, basic military hygiene, 26 April 2010 – 30 April 2010
- Refresher course – basis in tropical and travel medicine – for NIZP, 02 November 2010 – 04 November 2010

Computing

- Basic course – Information technologies for general practitioners, 10 May 2010 – 14 May 2010, 06 December 2010 – 10 December 2010

General Medicine

- Refresher course – transportation of casualties in the field, 26 April 2010 – 29 April 2010, 06 September 2010 – 09 September 2010
- Basic course in first aid in the field, 04 January 2010 – 08 January 2010, 11 January 2010 – 15 January 2010, 18 January 2010 – 22 January 2010, 15 February 2010 – 19 February 2010, 22 February 2010 – 26 February 2010, 12 April 2010 – 16 April 2010, 19 April 2010 – 23 April 2010, 10 May 2010 – 14 May 2010, 06 September 2010 – 21 September 2010, 08 November 2010 – 12 November 2010, 29 November 2010 – 03 December 2010
- Refresher course – repetitory of extended first aid in field conditions, 01 November 2010 – 05 November 2010
- Refresher course – 24 May 2010 – 28 May 2010
- Refresher course – defibrillators and their operation, 15 April 2010 – 15 April 2010, 23 September 2010 – 23 September 2010
- Innovative course – review of first aid, 03 May 2010 – 05 May 2010
- Refresher course – BATLS/BARTS, 16 February 2010 – 18 February 2010, 06 April 2010 – 08 April 2010, 31 May 2010 – 02 June 2010, 22 November 2010 – 24 November 2010
- Basic course – BARTS for CLS – extended first aid, 22 February 2010 – 12 March 2010, 15 March 2010 – 02 April 2010, 03 May 2010 – 21 May 2010, 07 June 2010 – 25 June 2010, 04 October 2010 – 22 October 2010, 25 January 2010 – 12 February 2010, 06 December 2010 – 22 December 2010

Molecular Pathology

- Refresher course – new drug development (drug design), 22 November 2010 – 22 November 2010

Multidisciplinary Studies

- Preparatory course for entrance examination, 31 May 2010 – 05 June 2010

COURSES, RESIDENCIES

- Refresher course – ecology and waste disposal – waste economy, 17 May 2010 – 21 May 2010
- Crisis intervention, 25 October 2010 – 27 October 2010
- Refresher course in MS WINDOWS XP and MS WORD XP, 18 October 2010 – 20 October 2010
- Basic course – STATISTICS and MS EXCEL XP, 31 May 2010 – 04 June 2010
- Refresher course – Dealing with extremely dangerous poisons, drugs and psychotropic substances, 18 January 2010 – 21 January 2010, 10 May 2010 – 13 May 2010, 14 June 2010 – 17 June 2010, 01 November 2010 – 04 November 2010
- Refresher course for health personnel – psychology and crisis interventions, Psychology and crisis intervention, management of difficult patients, 25 October 2010 – 27 October 2010

INTERNATIONAL COOPERATION

Cooperation at the military medical facility level

Brazil	<ul style="list-style-type: none">• Salvador, Bahia• Universidade Federal de Santa Catarina, Florianopolis
Bulgaria	<ul style="list-style-type: none">• Military Medical Academy, Sofia
Croatia	<ul style="list-style-type: none">• Department of Microbiology and Parasitology, University of Rijeka, Rijeka
France	<ul style="list-style-type: none">• Health Service and Army Research Center (C.R.S.S.A.), La Tronche (Grenoble)• School of the Health Service of the Armies of Lyon-Bron (E.S.S.A. Lyon), Lyon
Germany	<ul style="list-style-type: none">• Institute of Microbiology of Federal Armed Forces Medical Academy, Munich• Institute of Pharmacology and Toxicology of Federal Armed Forces Medical Academy, Munich• NATO School, Oberammergau
India	<ul style="list-style-type: none">• Pandit Ravishankar Shukla University, Raipur
Poland	<ul style="list-style-type: none">• Military Institute of Hygiene and Epidemiology, Warsaw
Slovakia	<ul style="list-style-type: none">• Air Forces Hospital, Košice• Central Military Hospital, Ružomberok• Military Health Service, Bratislava• Military Institute of Hygiene and Epidemiology, Bratislava
Sweden	<ul style="list-style-type: none">• FOI NBC-Defence, Umea• Swedish Defence Research Agency, Dr. Artursson – Department of Threat Assessment, Division of NBC Defence, Umea

- | | |
|-----------------|---|
| The Netherlands | <ul style="list-style-type: none">• Division of Toxicology, TNO Prins Maurits Laboratory, Rijswijk• Chemical and Biological Division, TNO Prins Maurits Laboratory, Rijswijk |
| Turkey | <ul style="list-style-type: none">• Gulhane Military Medical Academy, Ankara |
| Ukraine | <ul style="list-style-type: none">• Military Medical Corps, Kiev |
| United Kingdom | <ul style="list-style-type: none">• Defence Medical Services Training Centre Keogh Barracks in Aldershot, Ash Vale• DRDC, Suffield |
| United States | <ul style="list-style-type: none">• United States Defense Institute of International Legal Studies, Newport |

Scientific cooperation with civilian institutions abroad (on the basis of individual agreements and joint projects)

- | | |
|---------|---|
| Austria | <ul style="list-style-type: none">• Baxter, Vienna• Center of Biomolecular Medicine & Pharmacology, Medical University of Vienna, Vienna• Institute of Chemical Technologies and Analytics, Vienna University of Technology, Vienna |
| Belgium | <ul style="list-style-type: none">• GlaxoSmithKline Biologicals, Rixensart |
| Croatia | <ul style="list-style-type: none">• Institute for Medical Research and Occupational Health, Zagreb |
| France | <ul style="list-style-type: none">• Aventis Pasteur MSD, Lyon• Saint Louis Hospital, Paris |
| Germany | <ul style="list-style-type: none">• Department of Solid States Nuclear Physics, University of Leipzig, Leipzig• Max-Planck Institute, Berlin |
| Hungary | <ul style="list-style-type: none">• Semmelweis University, College of Health Care Department of Dietetics, Budapest |

INTERNATIONAL COOPERATION

- | | |
|----------------------|--|
| Republic of Korea | <ul style="list-style-type: none">• Korea Research Institute of Chemical Technology, Daejeon• Medicinal Science Division, Korea Research Institute of Chemical Technology, Daejeon |
| Mongolia | <ul style="list-style-type: none">• National Research Center for Infectious Diseases, Ministry of Health, Ulaanbaatar |
| Norway | <ul style="list-style-type: none">• Department of Nutrition, Medical Faculty, University of Oslo, Oslo |
| Poland | <ul style="list-style-type: none">• WIHE, Dr Zdanowski – Zakład Farmakologii i Toksykologii, Warszawa |
| Portugal | <ul style="list-style-type: none">• University of Coimbra, Department of Pharmacology, Coimbra |
| Russian Federation | <ul style="list-style-type: none">• M. V. Lomonosov Moscow State University, Moskva |
| Slovakia | <ul style="list-style-type: none">• Chemical Institute, Slovak Academy of Sciences, Bratislava• Institute of Experimental Oncology, Bratislava• P. J. Šafárik University, Košice• Slovak Medical University, Bratislava• Virological Institute, Slovak Academy of Sciences, Bratislava |
| Sweden | <ul style="list-style-type: none">• University of Umea, Umea |
| Switzerland | <ul style="list-style-type: none">• Swiss Institute of Technology, Zürich |
| United Arab Emirates | <ul style="list-style-type: none">• Department of Pharmacology and Therapeutics, Faculty of Medicine and Health Science, United Arab Emirates University, Al Ain• United Arab Emirates University, Al Ain |
| United Kingdom | <ul style="list-style-type: none">• Health Protection Agency, Porton Down• University of St. Andrews, St. Andrews, Scotland |
| United States | <ul style="list-style-type: none">• Emory University, Atlanta• Emory University, Department of Pathology, Atlanta• Merck & Co., Inc, Whitehouse Station• MMRHVLB/CCID/CDC, Atlanta• University of Washington, Seattle• Vital Probes, Mayfield, Pa• Walter Reed Army Institute of Research, Silver Spring• Wyeth, New Jersey |

Participation in international projects and networks

- | | |
|---------------|--|
| Belgium | • European Defence Agency, Brussels |
| Sweden | • European Programme for Intervention Epidemiology Training, European Centre for Disease Prevention and Control, Stockholm |
| Switzerland | • European Study Group on Nosocomial Infection, |
| United States | • Indiana University, Bloomington, Indiana |

Cooperation in the field of disaster medicine

- | | |
|----------------|---|
| United Kingdom | • Royal Centre for Defence Medicine, Birmingham |
|----------------|---|

Other expert commissions

- J. Bajgar – Ad hoc Group of the State Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Biological (Bacteriological) and Toxin Weapons
- R. Chlíbek – member of C.O.P.E. – Consensus on Pertussis Booster Vaccination in Europe, Brussels
- R. Chlíbek – member of GPI – Global Pertussis Initiative
- R. Chlíbek – member of NATO HFMP
- R. Chlíbek – supervisor of CEVAG
- L. Jebavý – member of European Group for Blood and Marrow Transplantation
- L. Jebavý – member of Multinational Association of Supportive Care in Cancer
- L. Jebavý – member of European Study Group on Nosocomial Infections
- J. Kassa – member of NATO CBRN Medical Working Group
- J. Kassa – member of Editorial board of Journal of Medical Chemical, Biological and Radiological Defence
- K. Kuča – member of Editorial board of iBusiness (Scientific Research Publishing)
- K. Kuča – member of Editorial board of Journal of Enzyme Inhibition and Medicinal Chemistry
- K. Kuča – member of Editorial board of Research in Pharmaceutical Biotechnology (Academic Journals)
- K. Kuča – member of Editorial board of The Open Enzyme Inhibition Journal (Bentham)

INTERNATIONAL COOPERATION

- A. Macela – member of NATO HFMP TG 099
- A. Macela – member of NATO HFMP ET 099
- A. Macela – Recoop HST Consortium – supervisor
- A. Macela – member of EDA CapTech GEM3
- A. Macela – member of Editorial board of FEMS Immunology and Medical Microbiology
- R. Prymula – member of European HPV board
- R. Prymula – member of Global advisory board on pneumococcal vaccines
- R. Prymula – chairman of CEVAG (Central European Vaccine Advisory Group)
- R. Prymula – member of NATO COMEDS WG–MT
- R. Prymula – chairman of Joint Clinical Trial Network RECOOP HST
- R. Prymula – member of management board of ECDC
- R. Prymula – member of European Rotavirus Speakers' Bureau
- R. Prymula – member of Steering Committee ECDC
- J. Smetana – member of NATO COMEDS MMT EP
- J. Smetana – member of Rotavirus Vaccination Advisory Board GlaxoSmithKline Biologicals
- M. Špliňo – member of Advisory Council of International Biographical Centre
- M. Špliňo – member of UN Commission in NY for the control and adherence to the UN Security Council in Iraq
- M. Špliňo – member of European Study Group on Nosocomial Infection

SCIENTIFIC AND RESEARCH ACTIVITIES

Completed full professorships

Cabal Jiří

Department of Toxicology, Faculty of Military Health Sciences, University of Defence, Hradec Králové

area of specialization: Protection of Troops and Population

professor's lecture: Conception of Research Work in Protection Troops and Population

Fiala Zdeněk

Department of Hygiene and Preventive Medicine, Faculty of Medicine in Hradec Kralove, Charles University

area of specialization: Hygiene, Preventive Medicine and Epidemiology

professor's lecture: Conception of scientific work and teaching in the branch of Hygiene, Preventive Medicine and Epidemiology

Completed associate professorships

Šinkorová Zuzana

Department of Radiobiology, Faculty of Military Health Sciences, University of Defence, Hradec Králové

area of specialization: Military Radiobiology

habilitation thesis: Ontogeny and radiosensitivity of B cells

habilitation lecture: New frontiers and challenges in radiation biodosimetry

Ostrý Vladimír

Department for Food Hygiene and Safety Laboratories in Brno, National Institute of Public Health in Prague

area of specialization: Toxicology

SCIENTIFIC AND RESEARCH ACTIVITIES

habilitation thesis: Selected alternaria and fusarium mycotoxins.: toxicologic information and assessment of dietary exposition

habilitation lecture: Food of new type – a toxicologist`s role in its health safety assessment

Dissertation defences

Huňka Antonín

Department of Public Health, Faculty of Military Health Sciences, University of Defence, Hradec Králové

study programmes: Management, marketing and logistics

dissertation: Reengineering of logistic processes in specific environment

Žďárová Karasová Jana

Department of Toxicology, Faculty of Military Health Sciences, University of Defence, Hradec Králové

study programmes: Toxicology

dissertation: Evaluation of acetylcholinesterase reactivators and organophosphates in tissues – penetration through the barriers

Lochman Petr

Department of Field Surgery, Faculty of Military Health Sciences, University of Defence, Hradec Králové

study programmes: Military Surgery

dissertation: Topical antibiotic attached to degradable carrier in prophylaxis and treatment of acute wound infections

Šmejkal Karel

Department of Field Surgery, Faculty of Military Health Sciences, University of Defence, Hradec Králové

study programmes: Military Surgery

dissertation: Operation treatment of proximal humeral fractures

Vaněk Jan

Faculty of Informatics and Management, University of Hradec Kralove

study programmes: Information and Knowledge Management

dissertation: Visualization of digital terrain Models using hardware accelerated rendering

Motyčka Petr

Department of Surgery, University Hospital Hradec Králové

study programmes: Military Surgery

dissertation: A new type of diverting ileostomy

Trlica Jan

Department of Surgery, University Hospital Hradec Králové

study programmes: Military Surgery

dissertation: Reamed versus unreamed intramedullar nail in treatment of tibial shaft fractures

Härtlová Anetta

Centre of Advanced Studies, Faculty of Military Health Sciences, University of Defence, Hradec Králové

study programmes: Infection Biology

dissertation: Molecular mechanisms of the interaction of intracellular pathogen *Francisella tularensis* and antigen presenting cells

Bárta Radek

Emergency Medical Service of the Plzeň Region and Department of Anesthesiology and Resuscitation, Hospital Rokycany

study programmes: Military Hygiene

dissertation: Possibilities of influence on inside microclimate in transport isolator (BIOVAK)

Aster Viktor

Department of Infectious and Tropical Diseases, First Faculty of Medicine, Charles University in Prague

study programmes: Epidemiology

dissertation: Prevalence of GBV-c/HGV infection and influence of co-infection on the course of the disease progression in HIV-infected patients

SCIENTIFIC AND RESEARCH ACTIVITIES

Knížek Petr

Department of Infectious Diseases, Regional Hospital Pardubice

study programmes: Epidemiology

dissertation: Human ehrlichiosis-epidemiology, diagnosis and treatment in Pardubice region

Kabelka Zdeněk

Department of Otorhinolaryngology, 2nd Faculty of Medicine, Charles University in Prague and Faculty Hospital Motol

study programmes: Epidemiology

dissertation: Cochlear implantation in children deafened after purulent meningitis, epidemiological background and prognosis of rehabilitation

Kolářová Iveta

Radiological Centre Multiscan, Regionall Hospital Pardubice

study programmes: Military Radiobiology

dissertation: The importance of PET/CT in radiotherapy planning for head and neck cancer

THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE FACULTY OF MILITARY HEALTH SCIENCES IN 2010

THE INTERNAL GRANT AGENCY OF THE CZECH REPUBLIC HEALTH SERVICE

Principal investigators

Hana Střítecká

(9985) Change of body proportion of school children

Jiří Stulík

(NS9747) Development of new anti-tularemic vaccine on the basis of elucidation of molecular mechanism of tularemia pathogenesis

Jana Žďárová Karasová

(NS9748) The evaluation of potency acetylcholin-esterase reactivators to penetrate through the blood-brain barrier

Co-investigators

Lukáš Červený

(NS9747) Development of new anti-tularemic vaccine on the basis of elucidation of molecular mechanism of tularemia pathogenesis

Jana Fajfrová

(NS10363) Hemodynamic, clinical and biochemical monitoring of patients before and after transjugular intrahepatic portosystemic shunt (TIPS), part. IV

Pavol Hlúbik

(NS10363) Hemodynamic, clinical and biochemical monitoring of patients before and after transjugular intrahepatic portosystemic shunt (TIPS), part. IV

Martin Hubálek

(NS10382) Identification of biomarkers of intraamniotic infection and a syndrom of inflammatory fetus response in amniotic fluid: proteome approach

Juraj Lenčo

(NS10382) Identification of biomarkers of intraamniotic infection and a syndrom of inflammatory fetus response in amniotic fluid: proteome approach

THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE FMHS

Martin Hubálek

(NS9747) Development of new anti-tularemic vaccine on the basis of elucidation of molecular mechanism of tularemia pathogenesis

Zuzana Kročová

(NS9747) Development of new anti-tularemic vaccine on the basis of elucidation of molecular mechanism of tularemia pathogenesis

Aleš Macela

(NS9747) Development of new anti-tularemic vaccine on the basis of elucidation of molecular mechanism of tularemia pathogenesis

Adéla Strašková

(NS9747) Development of new anti-tularemic vaccine on the basis of elucidation of molecular mechanism of tularemia pathogenesis

Roman Prymula

(NS9643) The presence of sortase enzymes SrtB, SrtC and SrtD in clinical isolates of *Streptococcus pneumoniae* and their role in the virulence and resistance to antimicrobials

Kamil Kuča

(NS9748) The evaluation of potency acetylcholin-esterase reactivators to penetrate through the blood-brain barrier

Ladislav Novotný

(NS9748) The evaluation of potency acetylcholin-esterase reactivators to penetrate through the blood-brain barrier

THE EXECUTIVE AGENCY FOR HEALTH AND CONSUMERS

Principal investigators

Kamil Kuča

(100940) ORCHIDS – Evaluation, optimisation, trialling and modelling procedures for mass casualty

Co-investigators

Jiří Cabal

(100940) ORCHIDS – Evaluation, optimisation, trialling and modelling procedures for mass casualty

THE GLAXOSMITHKLINE BIOLOGICALS CO.

Principal investigators

Roman Chlíbek

(110390 (ZOSTER-006)) A phase III, randomized, observer-blind, placebocontrolled, multicentre, clinical vaccination trial to assess the prophylactic efficacy, safety, and immunogenicity of GSK Biologicals' herpes zoster gE/AS01B vaccine when administered intramuscularly on a 0, 2-month schedule in adults aged 50 years and older

Roman Chlíbek

(112077 (Zoster-010)) A phase II, observer-blind, randomised, placebo-controlled, adjuvant-dose selection, multicenter prophylactic vaccination study to evaluate the immunogenicity and safety of GSK Biologicals' herpes zoster vaccine, gE/AS01B, in comparison to gE combined with ½ dose AS01B adjuvant (gE/AS01E), to unadjuvanted gE (gE/Saline), and to Saline (placebo) when administered twice in subjects aged 50 years and older

Roman Chlíbek

(108494, Zoster-003) A phase II, single-blind, randomized, controlled, multicentre vaccination study to evaluate the safety and immune response of the GSK Biologicals Zoster vaccine, gE/AS01B, and to compare 3 doses of gE with AS01B adjuvant in healthy elderly subjects, aged 60 to 69 years and 70 years and above

Co-investigators

Jan Smetana

(110390 (ZOSTER-006)) A phase III, randomized, observer-blind, placebocontrolled, multicentre, clinical vaccination trial to assess the prophylactic efficacy, safety, and immunogenicity of GSK Biologicals' herpes zoster gE/AS01B vaccine when administered intramuscularly on a 0, 2-month schedule in adults aged 50 years and older

Jan Smetana

(108494, Zoster-003) A phase II, single-blind, randomized, controlled, multicentre vaccination study to evaluate the safety and immune response of the GSK Biologicals Zoster vaccine, gE/AS01B, and to compare 3 doses of gE with AS01B adjuvant in healthy elderly subjects, aged 60 to 69 years and 70 years and above

THE MINISTRY OF INDUSTRY AND TRADE

Co-investigators

Lenka Hernychová

(FR-TI1/292) Molecular diagnostics of bacterial antigens

EU COST PROGRAMME

Co-investigators

Jiří Stulík

(COST Action B28) Array technologies for BSL3 and BSL4 pathogens

THE CZECH REPUBLIC GRANT AGENCY

Principal investigators

Kamil Musílek

(GP203/09/P130) Development of novel acetylcholinesterase inhibitors as treatment of Myasthenia Gravis

Juraj Lenčo

(GP301/09/P241) Development of proteomic methods for deeper quantitative analysis of plasma proteome

Pavel Bošík

(GAP304/10/1161) The role of virus associated cellular proteins in T-lymphocyte dysfunction

Co-investigators

Jiřina Vávrová

(GA304/08/0329) Study of factors in a tissue microenvironment that influence the process of skeletal muscle repair

Zuzana Šinkorová

(GA304/08/0329) Study of factors in a tissue microenvironment that influence the process of skeletal muscle repair

THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE FMHS

Aleš Tichý

(GA304/08/0329) Study of factors in a tissue microenvironment that influence the process of skeletal muscle repair

Lenka Hernychová

(GA203/09/0857) New analytical approaches for identification of proteins with significant attributes for virulence and pathogenicity of bacteria

Martin Hubálek

(GAP304/10/0868) The proteomics-based study on molecular mechanisms of early lymph node metastases formation in low grade breast cancer

Zuzana Kročová

(GAP304/10/1161) The role of virus associated cellular proteins in T-lymphocyte dysfunction

Martin Hubálek

(GAP304/10/1161) The role of virus associated cellular proteins in T-lymphocyte dysfunction

Pavel Řehulka

(GAP304/10/1161) The role of virus associated cellular proteins in T-lymphocyte dysfunction

Vanda Bošťíková

(GAP304/10/1161) The role of virus associated cellular proteins in T-lymphocyte dysfunction

Lukáš Červený

(GAP304/10/1161) The role of virus associated cellular proteins in T-lymphocyte dysfunction

Jaroslav Pejchal

(GAP304/10/1161) The role of virus associated cellular proteins in T-lymphocyte dysfunction

THE MINISTRY OF EDUCATION, YOUTH AND SPORTS

Principal investigators

Zuzana Šinkorová

(2B08028) New biological methods of the received dose determination

Lenka Hernychová

(ME08105) Differential proteome analysis of bacterial *Francisella tularensis* glyco- and phospho- proteins

Jiří Stulík

(OC 151) Proteome analysis of extracytoplasmic stress response in *Francisella tularensis* strain with different virulence

Kamil Musílek

(ME09086) Development of novel antidotal treatment against organo-phosphorus pesticides

Co-investigators

Lenka Zárybnická

(2B08028) New biological methods of the received dose determination

Aleš Tichý

(2B08028) New biological methods of the received dose determination

Zdeňka Vilasová

(2B08028) New biological methods of the received dose determination

Lucie Balonová

(ME08105) Differential proteome analysis of bacterial *Francisella tularensis* glyco- and phospho- proteins

Jana Klimentová

(ME08105) Differential proteome analysis of bacterial *Francisella tularensis* glyco- and phospho- proteins

Jiří Stulík

(ME08105) Differential proteome analysis of bacterial *Francisella tularensis* glyco- and phospho- proteins

Aleš Tichý

(ME08105) Differential proteome analysis of bacterial *Francisella tularensis* glyco- and phospho- proteins

Juraj Lenčo

(ME10025) Proteomic identification of biomarkers of intraamniotic inflammation in amniotic fluid in preterm birth patients

Kamil Kuča

(ME09086) Development of novel antidotal treatment against organo-phosphorus pesticides

Miroslav Pohanka

(ME09086) Development of novel antidotal treatment against organo-phosphorus pesticides

Jana Žďárová Karasová

(ME09086) Development of novel antidotal treatment against organo-phosphorus pesticides

THE NOVARTIS

Principal investigators

Roman Prymula

(V72P12E1) A phase 2b, open label, multi-center, extension study to evaluate the safety, tolerability and immunogenicity of a booster dose of Novartis meningococcal B recombinant vaccine administered at 12, 18 or 24 months of age in subjects who perviously received a three-dose primary series of the Novartis meningococcal B recombinant vaccine as infants in study V72P12

Roman Prymula

(2008-001592-30) A phase 2b, open label, randomized, parallel-group multi-center study to evaluate the safety, tolerability and immunogenicity of Novartis Meningococcal B Recombinant Vaccine when administered with or without routine infant vaccinations to healthy infants according to different immunization schedule

Roman Prymula

(2007-007781-38) A phase 3, partially blinded, randomized, multi-center, controlled study to evaluate imunogenicity, safety and lot to lot consistency of Novartis Meningococcal B Recombinant Vaccine when administered with routine infant vaccinations to healthy infants

Roman Prymula

(2008-006301-17) A phase 3, open label, multi-center, extension study to evaluate the safety, tolerability and immunogenicity of Novartis Meningococcal B Recombinant Vaccine when administered as a booster at 12 months of age or as a two-dose catch-up to health toddlers who participated in study V72P13

Roman Prymula

(2009-010106-11) A phase 2 partially observer-blind randomized controlled multi-center dose-ranging and formulation-finding study of a new Novartis Meningococcal B Recombinant Vaccine evaluating the safety and

THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE FMHS

immunogenicity when given concomitantly with routine vaccines in 2-month-old infants

Co-investigators

Roman Chlíbek

(2008-001592-30) A phase 2b, open label, randomized, parallel-group multi-center study to evaluate the safety, tolerability and immunogenicity of Novartis Meningococcal B Recombinant Vaccine when administered with or without routine infant vaccinations to healthy infants according to different immunization schedule

Roman Chlíbek

(2007-007781-38) A phase 3, partially blinded, randomized, multi-center, controlled study to evaluate immunogenicity, safety and lot to lot consistency of Novartis Meningococcal B Recombinant Vaccine when administered with routine infant vaccinations to healthy infants

Roman Chlíbek

(2008-006301-17) A phase 3, open label, multi-center, extension study to evaluate the safety, tolerability and immunogenicity of Novartis Meningococcal B Recombinant Vaccine when administered as a booster at 12 months of age or as a two-dose catch-up to health toddlers who participated in study V72P13

Roman Chlíbek

(2009-010106-11) A phase 2 partially observer-blind randomized controlled multi-center dose-ranging and formulation-finding study of a new Novartis Meningococcal B Recombinant Vaccine evaluating the safety and immunogenicity when given concomitantly with routine vaccines in 2-month-old infants

PLAN DE COOPÉRATION FRANCO-TCHÈQUE AND GENERAL DIRECTION FOR ORDNANCE

Co-investigators

Daniel Jun

(16A03-FR20/08co501) Catalytic bioscavengers of neurotoxic organophosphates: Optimization and functionalization

THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE FMHS

THE ROCHE CO.

Principal investigators

Vanda Boštková

(VZV) Whole varicella-zoster virus (VZV) genome sequencing of individual wild type and vaccine strains using GS Junior Benchtop System

Co-investigators

Pavel Boštík

(VZV) Whole varicella-zoster virus (VZV) genome sequencing of individual wild type and vaccine strains using GS Junior Benchtop System

Jan Smetana

(VZV) Whole varicella-zoster virus (VZV) genome sequencing of individual wild type and vaccine strains using GS Junior Benchtop System

NATIONAL INSTITUTES OF HEALTH

Principal investigators

Pavel Boštík

(R01AI065362-02) Molecular mechanisms of CD4+ T cell dysfunction in SIV

NATO SCIENCE FOR PEACE AND SECURITY (SPS) PROGRAMME

Principal investigators

Leo Klein

(CBP.MD.ATC.983603) Advanced Training Course: "Best Way of Training for Mass Casualty Situations"

DEFENCE RESEARCH PROJECTS – INITIATED IN 2010

Jiří Dresler

(OVUVZU2010001) The proposal of workflow of unambiguous identification of the complex of highly virulent bacterial biological agents using mass spectrometry and molecular biology methods and testing their feasibility on environmental samples

DEFENCE RESEARCH PROJECTS – CONTINUING IN 2010

Jiří Stulík

(OVUOFVZ200808) FRANCIS – Development of new prophylactic tools against *Francisella tularensis* infection

Jiřina Vávrová

(OVUOFVZ200806) RONSDOZ – Noninvasive measurement of proinflammatory markers of oxidative stress in irradiated as an indicator of received dose of radiation. Protective role of acetyl-L-carnitine

Daniel Jun

(OVUOFVZ200902) OTRAHA – Novel prophylactic antidotes of nerve agent poisonings based on scavengers

Zuzana Šinkorová

(OVUOFVZ200809) INDIKÁTOR II – Reverse detection of received ionizing radiation dose by monitoring of cell population changes using biophysical methods

Kamil Kuča

(OVUOFVZ200803) SUBSTANCE – Development of novel decontaminants and disinfectants of skin based on micellar compounds

Jiří Páral

(OVUOFVZ200804) LEPIDLO – Testing of possible use of cyanoacrylate tissue glues in high risk intestinal anastomoses

Kamil Musílek

(OVUOFVZ200805) INHIBITOR – Novel inhibitors of acetylcholinesterase as prophylaxis of nerve agent poisonings

Martin Hubálek

(OVUOFVZ200901) BIODEFENCE – Classification of biological agents – support of an international project „Establishment and management of a common database of B-agents – A European Laboratory Biodefence Network

Zuzana Čermáková

(OVUVZU2008001) LEPTOSPIROSIS – Risk evaluation and new possibilities of detection

Miroslav Pohanka

(OVUOFVZ200807) PROTEIN – Biosensors for determination of nerve agents and yperites using recombinant proteins and nanotechnology

Rudolf Štětina

(OVUOFVZ200810) YPERIT – Potential interference of toxic properties of sulphur mustard

Ivo Žvák

(OVUOFVZ200904) ACETABULA – Crossover external fixator of acetabular fractures

Miroslav Fajfr

(OVUVZU2008002) HOREČKA – Method of viral hemorrhagic fevers' causative agents rapid detection and identification

Leo Klein

(OVUOFVZ200903) NOTES – Surgical treatment of the digestive tube's penetrating injuries using Natural Orifice Transluminal Endoscopic Surgery

Ladislav Novotný

(OVUOFVZ200905) MORČE – Influence of the nerve agent and reactivators of acetylcholine esterase on the Guinea pig

Jiří Cabal

(OVUOFVZ200801) REAKTIVÁTOR – Robotized system for in vitro evaluation of novel reactivators of acetylcholinesterase inhibited by nerve agents

Jana Žďárová Karasová

(OVUOFVZ200811) FARMAKO – Determination of important pharmacokinetic and biochemical parameters and evaluation of blood-brain barrier penetration using drugs introduced to Czech Army

RESEARCH AIMS

Ladislav Jebavý

(MO0FVZ0000503) Military – medical aspects of war surgery and war internal medicine

Jiří Kassa

(MO0FVZ0000501) Medical countermeasures of nuclear, biological and chemical casualties

Kamil Kuča

(MO0FVZ0000604) Information support of crises management in health care

Pavol Hlúbik

(MO0FVZ0000502) Implementation of the new information of hygiene, preventive medicine and epidemiology into the military health care

ARTICLES IN JOURNALS WITH IMPACT FACTOR

1. ASPOCK, H., ATKINSON, B., BAUMHACKL, U., BRIGGS, B., BUHL, M., CHATTERJEE, S., CHIMITIA, L., CHMELÍK, V., HUDECKOVA, H., LOPALCO, PL., PRYMULA, R. Tick-borne encephalitis: from childhood to golden age doe increased mobility mean increased risk? Conference report 11th meeting of the International Scientific Working Group Tick-Borne Encephalitis (ISW-TBE). *Vaccine*, 2010, vol. 28, no. 4, p. 875–876. IF 3.616
2. BAJGAR, J., HÁJEK, P., ŽDÁROVÁ KARASOVÁ, J., KASSA, J., PASEKA, A., SLÍŽOVÁ, D., KRS, O., KUČA, K., JUN, D., FUSEK, J., ČAPEK, L. A comparison of tabun-inhibited rat brain acetylcholinesterase reactivation by three oximes (HI-6, obidoxime, and K048) in vivo detected by biochemical and histochemical techniques. *Journal of Enzyme Inhibition and Medicinal Chemistry*, 2010, vol. 25, no. 6, p. 790–797. IF 1.496
3. BAJGAR, J., ŽDÁROVÁ KARASOVÁ, J., KASSA, J., CABAL, J., FUSEK, J., BLÁHA, V., TESAŘOVÁ, S. Tabun-inhibited rat tissue and blood cholinesterases and their reactivation with the combination of trimedoxime and HI-6. *Chemico-Biological Interactions*, 2010, vol. 187, no. 1–3, p. 287–290. IF 2.457
4. BALONOVÁ, L., HERNYCHOVÁ, L., MANN, B., LINK, M., BÍLKOVÁ, Z., NOVOTNÝ, M., STULÍK, J. Multimethodological approach to identification of glycoproteins from the proteome of *Francisella tularensis*, an intracellular microorganism. *Journal of Proteome Research*, 2010, vol. 9, no. 4, p. 1995–2005. IF 5.132
5. BAZHIN, A., TAMBOR, V., DIKOV, B., PHILIPPOV, P., SCHADENDORF, D., EICHMUELLER, S. cGMP-phosphodiesterase 6, transducin and Wnt5a/Frizzled-2- signaling control cGMP and Ca²⁺ homeostasis in melanoma cells. *Cellular and Molecular Life Sciences*, 2010, vol. 67, no. 5, p. 817–828. IF 6.09
6. BEREND, S., KATALINIC, M., VRDOLJAK, AL., KOVARIK, Z., KUČA, K., RADIC, B. In vivo experimental approach to treatment against tabun poisoning. *Journal of Enzyme Inhibition and Medicinal Chemistry*, 2010, vol. 25, no. 4, p. 531–536. IF 1.496
7. BEREND, S., RADIC, B., KUČA, K., VRDOLJAK, AL. The antidotal efficacy of the bispyridinum oximes K027 and TMB-4 against tabun poisoning in mice. *Chemico-Biological Interactions*, 2010, vol. 2010, no. 187, p. 291–294. IF 2.457

ARTICLES IN JOURNALS WITH IMPACT FACTOR

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INDEX

A

ANTOŠ, K. 134, 145, 146, 147,
148, 168, 185

B

BAJGAR, J. 14, 69, 94, 96, 105,
123, 124, 127, 134, 136, 139,
145, 146, 147, 154, 168, 169,
186, 187, 191, 199, 215

BALONOVÁ, L. 66, 77, 80, 89,
95, 96, 116, 123, 136, 148,
154, 156, 169, 170, 177

BARTOŠOVÁ, L. 69, 136, 168

BEDNARČÍK, P. 59, 136, 141,
147, 150, 155, 156, 157, 158,
162, 164, 165, 169, 173, 174,
175, 177, 181, 197, 207, 208

BENDOVÁ, T. 54

BERNARDOVÁ, M. 38

BLÁHA, V. 63, 134, 141, 153,
163, 199

BLANAŘ, R. 23, 24, 57, 59, 170

BLAŽEK, P. 36

BOCKOVÁ, I. 86

BOŠTÍK, P. 23, 24, 26, 30, 34,
35, 45, 46, 75, 84, 91, 96, 114,
119, 125, 126, 132, 136, 137,
143, 164, 170, 171, 204, 205,
210, 217

BOŠTIKOVÁ, V. 34, 35, 38, 45,
46, 75, 84, 92, 96, 115, 119,
136, 137, 138, 142, 143, 149,
150, 159, 161, 164, 170, 171,
184, 190, 194, 195, 196, 204,
205, 206, 210, 212

BRNDIAR, M. 25, 47, 171

C

CABAL, J. 24, 32, 33, 34, 69, 73,
74, 88, 94, 107, 112, 121, 123,
124, 128, 129, 131, 141, 145,
146, 151, 154, 159, 160, 161,
168, 169, 171, 186, 190, 191,
193, 194, 196, 198, 199

CELBA, P. 57

CELBOVÁ, E. 36

ČÁP, R. 50, 51, 154, 171, 176,
188

Č

ČERVENÝ, L. 26, 28, 29, 34, 45,
75, 80, 81, 84, 95, 111, 115,
125, 154, 171, 172, 207

D

DOBEŠ, D. 24, 50, 52, 90, 94, 95,
139, 152, 155, 161, 172, 190,
192, 194, 196

DRAHOKOUPILOVÁ, E. 130, 161

DRESLER, J. 15, 29, 32, 53, 81,
83, 88, 120, 137, 140, 148,
160, 172, 181, 188

DUŠEK, T. 32, 53, 88, 140

DUŠKOVÁ, K. 54

E

ETFLAIŠOVÁ, 86

F

FAJFR, M. 29, 44, 121, 155, 173

FAJFROVÁ, J. 59, 61, 94, 111,
130, 147, 150, 153, 155, 156,
157, 158, 161, 162, 164, 165,

173, 174, 175, 177, 181, 197,
207, 208, 213, 214
FERKO, A. 23, 32, 50, 51, 52, 53,
88, 137, 139, 140, 159, 171,
174, 176, 188, 194, 211
FIDRANSKÝ, M. 63
FIRYCHOVÁ, A. 26
FRANK, M. 52, 93, 125, 133, 175,
211
FUČÍKOVÁ, A. 89, 95, 131, 133,
153, 156, 175, 176
FUSEK, J. 23, 69, 95, 123, 132,
136, 140, 141, 143, 145, 154,
164, 166, 168, 169, 186, 206,
212

G

GRÖGER, T. 54

H

HALAJČUK, T. 59, 147, 155, 156,
158, 161, 164, 165, 173, 175,
181, 197
HAMAN, L. 47, 91, 96, 130, 141,
142, 150, 153, 163, 171, 176,
199
HANOVCOVÁ, I. 38, 137, 141,
143, 163, 170, 202
HÄRTLOVÁ, A. 26, 29, 77, 81,
92, 95, 109, 125, 135, 156,
176
HEJČOVÁ, J. 63
HERNYCHOVÁ, L. 24, 27, 66, 77,
79, 80, 82, 89, 114, 115, 116,
123, 127, 136, 146, 148, 154,
156, 159, 163, 169, 170, 176,
177, 184, 203, 204, 210, 217
HLAVÁČKOVÁ, H. 63
HLÚBIK, P. 23, 24, 59, 61, 90, 94,
95, 111, 122, 130, 138, 143,

147, 150, 153, 155, 156, 157,
158, 161, 162, 164, 165, 166,
173, 174, 177, 178, 181, 197,
207, 208, 214
HORÁČEK, J. 47, 91, 92, 94, 96,
125, 126, 131, 137, 138, 150,
151, 152, 153, 157, 158, 160,
171, 178, 179, 180, 185, 192,
203
HOŠEK, F. 51, 154, 159, 171,
176, 188
HRABINOVÁ, M. 26, 124, 141,
161
HRDLÍČKOVÁ, L. 36
HRSTKA, Z. 24, 63, 138, 148,
149, 166, 180
HUBÁLEK, M. 24, 25, 27, 28, 29,
34, 45, 75, 77, 79, 80, 81, 83,
84, 89, 93, 94, 111, 112, 115,
120, 125, 163, 172, 175, 180,
181, 203, 204
HUMLÍČEK, V. 57, 138, 147, 148,
163, 181, 192, 202, 203
HUŇKA, A. 63, 108, 138, 141,
156, 175, 197
HUSÁROVÁ, M. 59, 147, 150,
155, 156, 157, 158, 164, 165,
173, 174, 175, 177, 181, 197

CH

CHLÍBEK, R. 8, 15, 23, 38, 40,
41, 42, 43, 44, 90, 91, 92, 93,
94, 97, 105, 113, 118, 124,
126, 133, 136, 137, 138, 141,
142, 143, 145, 158, 159, 164,
170, 171, 172, 181, 182, 183,
184, 202, 205, 206, 210

J

JAKL, M. 47, 126, 138, 145, 175,
178, 184

INDEX

JANOUGH, J. 63, 138, 184, 185
JEBAVÝ, L. 23, 47, 89, 105, 122,
125, 126, 138, 150, 151, 152,
157, 158, 166, 171, 178, 179,
180, 185
JEŽEK, B. 145, 146, 148, 149,
168, 184, 185, 198, 199, 209,
212
JIŘIČKA, M. 26
JUN, D. 24, 26, 28, 31, 33, 34,
72, 73, 74, 87, 88, 118, 120,
123, 124, 126, 127, 128, 129,
132, 134, 136, 143, 145, 146,
147, 151, 159, 164, 166, 186,
190, 191, 195, 198, 206, 212
JUNKOVÁ, I. 86

K

KASSA, J. 13, 23, 33, 34, 69, 73,
74, 88, 90, 93, 95, 97, 105,
122, 123, 124, 126, 127, 134,
139, 144, 145, 146, 147, 151,
153, 154, 161, 163, 168, 169,
186, 187, 191, 195, 197, 198,
199, 215, 216
KLEIN, L. 11, 23, 32, 50, 52, 53,
88, 90, 95, 96, 119, 121, 139,
152, 154, 159, 161, 166, 171,
176, 187, 188, 196, 214, 215
KLIMENTOVÁ, J. 29, 66, 77, 80,
81, 92, 116, 127, 148, 160,
172, 188
KOMÁREK, V. 36
KONŠTACKÝ, S. 24, 54, 139,
140, 146, 189
KORÁBEČNÝ, J. 127, 128, 160
KOŠTÁLOVÁ, L. 38
KROČOVÁ, Z. 28, 29, 34, 45, 67,
72, 75, 77, 80, 81, 84, 112,
115, 125, 135, 190, 215
KRUTIŠ, J. 54, 190

KUBELKOVÁ, K. 27, 79, 97, 128,
135, 190
KUČA, K. 3, 23, 26, 28, 31, 32,
33, 34, 71, 72, 73, 74, 87, 88,
90, 93, 94, 96, 97, 105, 112,
116, 120, 122, 123, 124, 125,
126, 127, 128, 129, 130, 131,
132, 133, 134, 136, 138, 139,
140, 141, 143, 144, 145, 146,
147, 148, 151, 152, 153, 154,
157, 159, 160, 161, 162, 164,
166, 168, 169, 171, 175, 186,
187, 189, 190, 191, 192, 193,
194, 195, 196, 197, 198, 199,
203, 206, 212, 214, 215, 216
KUNEŠOVÁ, G. 69, 125

L

LAŠÁK, P. 63
LEGERSKÁ, K. 38
LENČO, J. 29, 77, 80, 81, 83, 84,
111, 114, 116, 127, 131, 133,
148, 153, 175, 203, 211, 212
LINK, M. 29, 81, 92, 123, 126,
154, 156, 160, 166, 169, 176,
192, 210, 212
LOCHMAN, P. 32, 50, 52, 53, 88,
90, 91, 95, 108, 133, 140, 152,
155, 160, 161, 172, 192, 196
LUKŠÍKOVÁ, L. 77

M

MACELA, A. 15, 23, 26, 27, 28,
79, 80, 106, 112, 127, 128,
135, 145, 172, 181, 190
MACHAČOVÁ, I. 47
MALÍKOVÁ, M. 38
MALÝ, V. 57, 147, 192
MAREK, J. 28, 71, 77, 125, 127,
128, 129, 132, 133, 140, 145,
146, 147, 151, 159, 160, 161,

164, 171, 175, 186, 189, 190,
191, 193, 195, 206
MATOUŠEK, R. 25, 54, 56, 93,
144, 149, 190, 193, 194, 199
MATULKOVÁ, P. 38
MĚCHURA, J. 63
MERVARTOVÁ, L. 65, 162
MÍŠKOVÁ, L. 25
MOJŽIŠ, M. 23
MRVEČKA, P. 57, 147, 148
MUSÍLEK, K. 24, 28, 30, 33, 34,
69, 71, 72, 73, 74, 88, 90, 94,
95, 97, 114, 116, 120, 124,
125, 126, 127, 128, 129, 130,
132, 134, 138, 139, 140, 144,
145, 146, 147, 151, 152, 153,
154, 157, 159, 160, 161, 168,
169, 178, 186, 187, 188, 189,
190, 191, 192, 195, 198, 199,
215, 216

N

NOVOTNÝ, L. 15, 26, 28, 31, 32,
34, 53, 71, 72, 74, 86, 87, 88,
112, 121, 123, 129, 130, 134,
146, 148, 151, 154, 156, 160,
162, 163, 169, 171, 177, 190,
191, 194, 197, 199, 204, 215,
216

Ö

ÖSTERREICHER, J. 14, 23, 29,
33, 67, 68, 72, 74, 81, 127,
133, 141, 197

P

PÁRAL, J. 32, 50, 51, 52, 53, 88,
92, 120, 130, 140, 142, 152,
155, 160, 161, 172, 192, 196
PÁVKOVÁ, I. 77, 156, 177

PAVLÍK, V. 59, 91, 94, 130, 140,
142, 147, 150, 153, 155, 156,
157, 158, 161, 162, 164, 165,
173, 174, 175, 177, 181, 196,
197, 207, 208

PEJCHAL, J. 26, 29, 33, 34, 45,
67, 68, 70, 72, 74, 75, 81, 84,
115, 127, 128, 131, 141, 143,
154, 162, 168, 197, 198

PEREGRINOVÁ, J. 59, 165

PETROVÁ, Z. 77

PÍRKOVÁ, J. 59

PLODR, 13, 52, 53, 140, 141, 142

POHANKA, M. 26, 28, 30, 31, 33,
34, 71, 72, 73, 74, 87, 88, 93,
94, 97, 117, 121, 124, 125,
126, 127, 128, 129, 130, 131,
134, 141, 145, 146, 147, 148,
151, 152, 153, 154, 157, 159,
160, 161, 162, 166, 168, 169,
171, 186, 187, 189, 190, 191,
192, 193, 195, 197, 198, 199,
213, 216

POTÁČ, M. 57, 141, 147, 148

PROCHÁZKA, M. 23, 63, 138,
146, 148, 149, 185, 199, 209

PRŮCHOVÁ, Š. 65

PRYMULA, R. 11, 12, 14, 15, 23,
38, 39, 42, 43, 44, 45, 106,
112, 117, 123, 126, 129, 131,
133, 142, 155, 162, 163, 172,
183, 198, 200, 201, 202, 210

PSUTKA, J. 13, 24, 57, 59, 148,
181, 192, 202, 203

PUDÍK, P. 24, 25

PUDÍKOVÁ, M. 86

R

RESLOVÁ, E. 69

ROHLENA, M. 25

RŮŽIČKA, M. 57, 142, 147, 148

RYDRYCH, J. 36

Ř

ŘEHULKA, P. 34, 45, 75, 77, 84,
97, 115, 128, 131, 132, 156,
163, 173, 177, 203, 204, 210

S

SHESHKO, V. 26, 91

SLAVÍK, J. 86

SLOVÁČEK, L. 47, 132, 142, 164,
178

SMETANA, J. 15, 24, 25, 35, 38,
40, 41, 44, 46, 90, 91, 94, 97,
106, 113, 119, 136, 137, 138,
142, 143, 145, 148, 159, 161,
164, 170, 171, 183, 184, 194,
204, 205, 206, 210

SOTONA, F. 23

SOUKUP, O. 94, 97, 128, 129,
132, 143, 145, 146, 151, 159,
164, 186, 191, 193, 206

SPLÍTKOVÁ, M. 57

STRAŠKOVÁ, A. 26, 28, 77, 80,
92, 95, 112, 154, 156, 171,
176, 177, 206, 207, 210

STRÍTECKÁ, H. 59, 61, 90, 91,
94, 96, 111, 142, 143, 147,
148, 150, 153, 155, 156, 157,
158, 162, 163, 164, 165, 173,
177, 178, 181, 197, 203, 207,
208, 217

STULÍK, J. 14, 23, 28, 29, 66, 77,
79, 80, 81, 82, 111, 114, 116,
120, 123, 125, 127, 131, 133,
135, 136, 148, 154, 156, 160,
163, 166, 169, 171, 172, 175,
176, 177, 181, 188, 192, 204,
207, 208, 210

SVOBODOVÁ, H. 69, 70, 75, 92,
93, 94, 185, 186, 208, 211

Š

ŠAFÁŘOVÁ, M. 77

ŠEDIVÁ, M. 54

ŠINKOROVÁ, Z. 24, 29, 31, 65,
67, 68, 72, 81, 107, 114, 115,
120, 133, 141, 161, 162, 165,
166, 167, 194, 197, 198, 208,
209, 215

ŠÍSTKOVÁ, J. 54

ŠKRANCOVÁ, V. 69

ŠMEJKAL, K. 15, 50, 52, 91, 95,
108, 133, 140, 159, 175, 176,
188, 209

ŠMÍDOVÁ, P. 54, 59

ŠMÍRA, P. 25, 63, 148, 149, 209

ŠPIDLOVÁ, P. 77, 90, 95, 130,
154, 156, 159, 163, 166, 171,
177, 184, 204, 207, 210

ŠPLÍŇO, M. 23, 38, 39, 97, 98,
106, 136, 137, 143, 149, 163,
164, 170, 171, 184, 195, 202,
205, 206, 210, 212

ŠŤASTNÁ, E. 26

ŠTĚTINA, R. 25, 69, 75, 92, 94,
121, 125, 140, 145, 168, 175,
185, 186, 208, 211

ŠUBRT, Z. 15, 32, 50, 53, 88, 90,
137, 152, 161, 171, 174, 196,
211

T

TAMBOR, V. 78, 123, 133, 211,
212

TICHÝ, A. 31, 33, 65, 66, 67, 68,
74, 80, 98, 115, 116, 125, 131,
133, 138, 141, 143, 150, 151,
153, 154, 157, 158, 159, 162,
163, 168, 178, 179, 180, 184,
197, 198, 202, 203, 204

TÓTHOVÁ, I. 29, 65, 67, 72, 81

U

UHLÍŘOVÁ, J. 69

V

VACKOVÁ, M. 15, 38, 137, 143,
149, 161, 194, 212

VANĚK, J. 63, 93, 98, 109, 145,
146, 148, 168, 184, 185, 198,
212

VÁVROVÁ, J. 23, 25, 33, 65, 68,
74, 114, 120, 129, 133, 134,
137, 141, 143, 154, 161, 162,
166, 167, 168, 171, 194, 198,
209, 212, 215

VÍCHOVÁ, E. 36

VILASOVÁ, Z. 26, 31, 67, 93, 116

VOPLATKOVÁ, Z. 25, 36

VOSEČKOVÁ, A. 24, 25, 59, 144,
147, 149, 150, 155, 156, 157,
158, 162, 164, 165, 166, 173,
174, 177, 181, 197, 207, 208,
213, 214

W

WITT, P. 27, 148

Z

ZAHRADNÍČKOVÁ, J. 50

ZAORAL, P. 25

ZÁRYBNICKÁ, L. 29, 31, 65, 67,
72, 81, 91, 92, 116, 133, 141,
162, 165, 166, 167, 197, 198,
208, 209, 215

ZEDNÍČEK, J. 36

ZIKOVÁ, J. 36

Ž

ŽÁK, M. 54, 59, 144, 149

ŽÁKOVÁ, J. 26

ŽDÁROVÁ KARASOVÁ, 24, 28,
30, 31, 33, 34, 69, 70, 71, 72,
73, 74, 87, 88, 90, 91, 92, 98,
108, 111, 117, 121, 123, 126,
127, 128, 129, 131, 134, 139,
140, 141, 144, 146, 147, 148,
151, 153, 154, 160, 161, 162,
168, 169, 186, 187, 189, 190,
191, 192, 195, 198, 199, 215,
216

ŽVÁK, I. 13, 50, 52, 121

2010 Annual Report was edited and published by the Faculty of Military Health Sciences, University of Defence, Hradec Králové, Czech Republic

Editor: Mgr. Hana Hlaváčková

Computer work: Lenka Hrdličková, Mgr. Hana Hlaváčková
(using the OBD 2.6 and the VERSO programs)

Printing: 300

Printed: University of Defence

Contact address:

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© Univerzita obrany, Brno, CZ

ISBN 978-80-7231-346-4