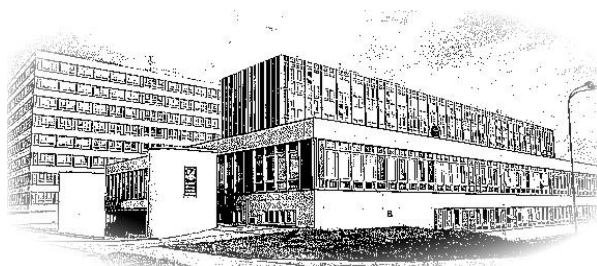


**UNIVERSITY OF DEFENCE**  
**FACULTY OF MILITARY HEALTH SCIENCES**

# **ANNUAL REPORT**

## **2014**

**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 of the University of Defence in Hradec Králové.*

*The 23<sup>rd</sup> Annual Report includes the principal research and educational activities of the 8 departments, 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://fvz.unob.cz> or <http://www.pmfhk.cz>.*

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

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## **FOREWORD**

The Faculty of Military Health Sciences of the University of Defence in Hradec Kralove is a centre of medical education and research in the Czech Army with long-term history in the Czech Republic. The military medical education began in Hradec Kralove in 1951. The school was established by an order of the President of the Republic as the Military Medical Academy, and later a honorary title of "Jan Evangelista Purkyně" was added. Later on, the name was changed to the Military Medical Research and Postgraduate Institute and in 1988 its original name was used again. In 2004, during professionalization of the army, reorganization of military education and establishment of the University of Defence, a new phase of the Faculty entitled the Faculty of Military Health Sciences began. Since 2004 our faculty has been one of the three faculties at the University of Defence. Presently, the Faculty of Military Health Sciences plays a key role in military university education with the highest scientific contribution at the university. After merging with two other originally separated military faculties, we have created a viable and developing organism emphasizing strengths of its units. Each faculty covers variety of different tasks with limited staff and resources. Our role is not only to educate and train all medical, pharmaceutical and nursing specialists and to keep scientific excellence, but also to provide a general support to the Military Medical Service which is influenced by staff cuts and restructuring policy as well. Primarily, the Faculty provides study in one accredited Bachelor's study programme (Military Paramedic), three Master's study programmes (Military General Medicine, Military Dentistry, Military Pharmacy) and eight Doctoral study programmes.

In spite of every year lower financial budget and personnel reduction, we would like to continue and even to increase most of our activities. Our scientific production rate is the highest at the entire University of Defence. The Czech (Medical Service) field hospitals are well-known around the world and there are not so many similar good examples in 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 thus the students gain deeper knowledge and wider skills as well as awareness of military life. Education, training and research should be joint 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 have been still dealing with specialization of the Czech Armed Forces in nuclear, biological and chemical protection and we have been engaged in 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 and fulfilment of training needs for medical corps, specialized forces and for some NATO

## FOREWORD

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countries. Nevertheless, our primary concern is to educate and train students and young physicians. This can be hardly possible without our closest partners, international workmates 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 specialities 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 held by former and present faculty personnel in important international institutions from the NATO Surgeon General in Europe, through a membership in various NATO, EU, United Nations Security Council, and World Health Organization boards, the European Centre for Disease Prevention and Control. 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 such as the Lancet.

The very fact that the Faculty has survived all reforms, 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 workplaces. Not all universities can be proud of so close collegial relationship as we have with the Medical and Pharmaceutical Faculties of Charles University, the University of Hradec Kralove, the Faculty of Health Studies in Pardubice, the Faculty Hospital in Hradec Kralove and the Military Medical Agency. In 2012, the Central Military Hospital in Prague was declared the Military Faculty Hospital. This medical facility, which we have cooperated very closely with creates a good background for military medical practice of our students. Personally, I value a cooperation with representatives of the city of Hradec Kralove, thanks to which the Faculty has an excellent reputation at city public. I am pleased that this collaboration continues.

I, as a new dean, appreciate my predecessors of the faculty management that they have sustained the tradition of highly educated military doctors and pharmacists. Being elected the FMHS dean, I consider the apex of my medical and military career. It is an honour to get an opportunity to contribute from such a top position to military pre-graduate and post-graduate education within next several years.

Dean of the Faculty of Military Health Sciences  
COL Assoc. Prof. Jiří PÁRAL, M.D., PhD.



# **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

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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.

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

The Academy continued 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.

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 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.

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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. The 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, substantial changes were introduced in this area. With the aim to join together all military academic institutions, i. e. the Military School of Ground Forces in Vyškov, the Military Academy in Brno and the Purkyně Military Medical Academy in Hradec Králové, the University of Defence in Brno was established. 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 Vojtkovský, CSc. became the Rector of the University of Defence. The University of Defence was officially opened with a solemn inauguration on October 8, 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 research work in the area of military health service. However, number of school employees was cut down.

Our school was, once again, renamed to University of Defence, Faculty of Military Health Sciences in Hradec Králové. The former rector of school COL Assoc. Prof. Roman Prymula, M.D., CSc., PhD. was elected to be the dean of our school by the vote of the Academic senate.

In the year 2004, members of our school together with other Czech Republic Army officers carried out their assignments in peacekeeping missions in Iraq, Afghanistan and the Balkans. 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 appreciated 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 October 6, 2005. He worked at that points as the Head of the Department of Toxicology and he was a chief specialist of the Czech Republic Army for toxicology.

The year 2006 was an anniversary 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. The Faculty participated in the preparation of Czech field hospital contingents, which provided 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., PhD. 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.

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. A competition for the best scientific student's work in doctoral study programmes was introduced for the first time that year. 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.

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During the year, COL Prof. Roman Prymula, M.D., PhD., was re-elected as the Dean of the school and on December 10 was inaugurated into this function.

Public acknowledgement of some of the Faculty eminent research specialists represented significant features of the activity of the Faculty of Military Health Sciences, University of Defence, were in the year 2008. Already in February, Assoc. Prof. Jiří Bajgar, M.D., DSc. 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 lecturing activities. In addition, Assoc. Prof. Bajgar, was awarded the prestigious Astra Zeneca Award gained from the American Society of Toxicology. The prize winner significantly contributed to the 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, two letters of appointment of new Czech Universities professors to two eminent workers of the Faculty presented by the President of the Republic to LTC Assoc. Prof. Jan Österreicher, M.D., PhD. and Assoc. Prof. Jiří Stulík, M.D., PhD.

The Faculty workers confirmed repeatedly both their research and organizational 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., DSc. (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 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 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., PhD. 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 student research work in 2009.

Prof. Aleš Macela, DSc. 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. was selected to serve as a director of the University Hospital in Hradec Králové. The Academic Senate elected LTC Assoc. Prof. Roman Chlíbek, M.D., PhD. 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 C. A., 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 other awards during the year 2010: 2009 Kredba 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.

In the year 2011, Assoc. Prof. Kamil Kuča was awarded the Prize of the Rector of the University of Defence for scientific research in 2011, especially for excellent results in solving scientific projects in the area of protection against chemical warfare agents.

Prof. Stulik's project entitled Identification of novel *Francisella tularensis* targets for subunit vaccine development was supported by the Defence Threat Reduction Agency, USA for the years 2011–2014. This project is aimed at the development of a subunit vaccine against tularemia. It focuses on (1) the identification of surface associated or secreted virulence factors from *F. tularensis* using immunoproteomic approaches (2) cloning and expression of these gene products, (3) confirming the role of the selected

## **HISTORY**

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targets in virulence, and (4) assessing these proteins as protective antigens in animal models.

The Central Military Hospital in Prague became the faculty hospital for the Faculty of Military Health Sciences in 2012.

In January 2013, there was a change at the position of Vice-Dean for research. When Prof. Ing. Kamil Kuča, PhD. holding the position of Vice-Dean for research left the FMHS, Prof. MUDr. Pavel Boštík, PhD. replaced him.

In February 2013, scientists from the University of Defence, the Faculty of Military Health Sciences, from the University of Hradec Kralove and the Centre for Biomedical Research had the best poster presentation at 55th Czech-Slovak Psychopharmacological Conference held in Spa Jeseník. The project of authors Hroudová J., Fišar Z., Raboch J., Korábečný J., Kuča K., was entitled "In vitro effects of acetylcholinesterase inhibitors on monoaminooxidase and NADH-dehydrogenase activity".

In the beginning of May 2013 the Faculty hosted a visit of a Finnish group of CBRN experts and personnel from various branches involved in rapid response management of crises. Both sides presented their main interests during a seminar organized by our Faculty and the Finnish guests were given a tour of selected facilities. This was one of the examples of developing cooperation of European countries within the framework of the European Defence Agency.

In October 2013, the Rector-Commandant of the University of Defence Brigadier General Bohuslav Příkryl decorated LTC associate professor Zuzana Kročová with the University Medal for her exceptional efforts and long-term results achieved in her research work.

The year 2013 was the election year for the Faculty and the Senate. After 4 years it was time for the academic faculty and students to cast a vote for the Dean. In election, which was held in June, Col. Assoc. Prof. Jiří Páral, MD, PhD. received the majority of votes and became the new Dean in October 2013. New management of the school was selected by the new Dean.

The year 2014 brought a major change in the structure and functioning of the Faculty. In both the anticipation of a new Service Law an need for optimalization, the academic part of the school was rearranged into 8 departments. Some of the new Heads of the Departments were also selected in order to have always military officers as the Head and the Deputy-Head of each department.



## MAIN AIMS OF THE FACULTY IN 2014

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), medical rescue (3 years)
- to provide postgraduate study for PhD. degree (4 years) in accredited disciplines:

Epidemiology	Military Hygiene
Field Internal Medicine	Military Radiobiology
Field Surgery	Molecular Pathology
Infectious Biology	Toxicology
Medical Microbiology	Preventive Medicine and Public Health Protection

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

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 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. Well assembled scientific teams focus on individual research tasks using state-of-the-art technologies. Within the Faculty, complex laboratory technologies for scientific work are utilized for scientific advancements, which lead to the improvement 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 capabilities and international recognition of the scientific teams form a solid base for 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 priorities of the Army (biological agents, chemical agents, military health care), furthermore it joined 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 these critical 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 work within the studies focused on medical aspects of the effects of NBC agents the main focus of the „Centre of Advanced Studies“, which is now an integral part of the Department of Epidemiology. This 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 represent other important fields of scientific work.

Many invitations to international symposia and conferences as well as a 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 *Military Medical Science Letters* - the oldest military specialized journal, which has been published since 1925. As of the last year, the journal is published fully in English. 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 journals with impact factor and in other national and foreign journals. This fact enables relatively wide training activities in accredited doctoral study programmes.

The Faculty participates in 5 projects of Internal Grant Agency of the Ministry of Health, 3 projects of the Ministry of Education, Youth and Sports, 5 projects of the Grant Agency of the Czech Republic, 1 project of the Ministry of the Interior of the Czech Republic, 1 foreign project (DTRA).

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 8 departments – Epidemiology, Military Internal Medicine and Hygiene, Military Surgery, Emergency Medicine and Military General Medicine, Military Medical Service Organization and Management, Radiobiology, Toxicology and Military Pharmacology, Molecular Pathology and Biology.

In 2014, 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 continuous accreditation for proceedings to achieve professorships for the branches of Hygiene, Preventive Medicine, Epidemiology, Medical Microbiology, Toxicology, Military Radiobiology, Field Internal Medicine, Infection Biology and Molecular Pathology and the accreditation for habilitation (associate professorship) in the branches of Hygiene, Preventive Medicine and Epidemiology, Medical Microbiology, Toxicology, Field

Surgery, Military Radiobiology, Field Internal Medicine, Infection Biology and Molecular Pathology gives the evidence about the excellent level of achieved results in scientific and research activities of FMHS. In 2014, there were 12 professors (prof.), 12 associate professors (doc.), 3 doctors of science (DSc.), 62 persons with research degrees (CSc., PhD.) 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.

### **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 Lyon 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 Department of Information and Communication 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. Within last years FMHS members took part in several foreign missions.

## STRUCTURE OF THE FMHS



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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 next new group – the group of experimental biology was established on 1 September 2014.

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 (PhD. – epidemiology and medical microbiology) are certified by the Czech Governmental Commission. Since 1997, more than 30 students have finished their PhD. studies.

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

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, herpes zoster vaccines, Human Papilloma Virus vaccines, rotavirus vaccines, new adjuvanted vaccines against viral hepatitis B, Lyme disease vaccines, combined hepatitis B and typhoid fever vaccines, flu vaccines, meningococcal B vaccines or new vaccination schedules.

The members of the department are members of different Czech journals editorial boards (e. g. "Epidemiologie, mikrobiologie a imunologie" – prof. Splino, Military Medical Science Letters – Prof. Chlíbek), and they work as reviewers of international journals (Vaccine, Lancet Infectious Disease). Some of them work in a number of committees and boards: Vice-chairman of the Czech Immunization Committee of the Ministry of Health (Prof. Chlíbek), or European Centre for Disease Control and Prevention (Prof. Prymula, Prof. Chlíbek), or Central European Vaccination Awareness Group-CEVAG (Prof. Prymula, Prof. Chlíbek). Prof. Splino and Ass. Prof. Bostikova had opportunity to serve as members for Advisory Board for the Investigation and Control of Influenza and Other Epidemic Disease and Section for Control and Development of Diagnostics Laboratory Methods of CDC.

The members of the department are also members of NATO working groups and advisory committees for biological threats and weapons

(BIOMEDAC – Biological Medical Advisory Committee – Prof. Chlíbek) and NATO-Research&Technology Organisation (Prof. 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 or new antimicrobial agents.

## **RESEARCH PROJECTS**

**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., Smetana, J., Dítě, P., Gál, P., Vokurková, D.

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  $\geq 70$  YOA. The ZOSTER-022 study will enrol subjects in the age ranges 70-79 YOA and  $\geq 80$  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., Kalíšková, E., Smetana, J., Dítě, P., Gál, P., Vokurková, D.

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  $\geq 50$  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  $\geq 50$

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

**Correlation of expression of KIR alleles in NK cells in GALT and disease progression in SIV non-human primate model of AIDS**

Boštík, P., Boštíková, V.

Supported by the Ministry of Education, Youth and Sports, 2011–2014 (Project No.: LH11019)

The HIV infection in humans leads to AIDS, a deadly disease, which targets predominantly cells of the immune system. It has recently become clear that also the innate immune cells, such as NK cells play an important role in the response to the virus, especially in the acute phase, which dictates the subsequent course of the disease. The activation and inhibition processes that are in part tied to an expression of certain variants of the Killer-Ig-like receptors (KIRs) on these cells were shown to be associated with distinct outcomes of HIV disease. The aim of this project is to characterize the expression of KIR variants on NK cells in the gut associated lymphoid tissue in SIV infected rhesus macaques (RM), the only available model of human AIDS, and their correlation to the course of AIDS in RM. In addition, monoclonal antibodies against these variants, will be developed as new reagents. These data will further our knowledge of AIDS pathogenesis and may help in the subsequent vaccine design

**Improvement of vaccination efficacy by cholinergic anti-inflammatory pathway**

Pohanka, M., Hrabínová, M., Pavlík, M., Boštík, P., Kuča, K.

Supported by the Ministry of Education, Youth and Sports, 2011–2014 (Project No.: LH11023)

Cholinergic antiinflammatory pathway (CAP) is an important tool of regulation of innate immune responses mediated by the parasympathetic nervous system. The project is aimed at evaluating the performance of drugs affecting CAP as vaccine adjuvans. The primary hypothesis is that a suppression of CAP can potentiate the vaccination efficacy. Compound HI-6 inhibiting blood acetylcholinesterase will be tested for control purposes in comparison to drugs triggering CAP. The project will cover the following aspects :in vitro tests of drug effects, examination of effects of tested drugs on immune system alone and co-application of tested drugs with commercially available vaccine in comparison to the effect of the vaccine alone in-vivo in small laboratory animals. Basic immunochemical parameters such as immunoglobulin isotypes M and G, interleukins 2, 4 and 6 and selected biochemical parameters will be assessed. The expected results of project will be improvement of vaccines efficacy and better characterization of CAP as target of the selected drugs.

**New technologies for identification and typing of biological agents**

Kročová, Z., Boštík, P., Hanovcová, I., Jun, D., Macela, A.

Supported by the Czech Republic Ministry of Internal Affairs, 2012–2015 (Project No.: VF20122015024)

The aim of the project is to develop the methodological procedures for the isolation of bacterial and viral nucleic acids and protein and no-protein toxins from natural matrices, and the procedures for their identification and typing. In the case of bacteria and viruses are designed following the methodological procedures and specific technological and laboratory units: the acquisition and cultivation of biological agents, isolation of genome and plasmid DNA, or RNA in the case of a virus, the methodology and procedures for the preparation of samples of bacterial and viral nucleic acids from complex matrices, design of qPCR primers, probes and the reaction conditions and testing and validation of the proposed methods and procedures for the identification of biological agents. For the detection of low molecular weight toxins will be used high performance liquid chromatography coupled with tandem mass spectrometry and for detection and identification of protein toxins will be used mass spectrometric method SRM (Selected reaction monitoring).

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

Boštík, P., Řehulka, P., Pejchal, J., Boštíková, V., Kročová, Z.

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

Herpetetic 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**

Boštíková V., Smetana, J., Kaislerová, L., Boštík, P.

Supported by the Roche co., 2010–2014 (Project No.: VZV)

Varicella-zoster virus (VZV) is a highly infectious herpesvirus that affects up of the 90 % of human population. VZV causes chickenpox (varicella) predominantly in childhood and shingles (herpes zoster) in middle to old age people. While VZV usually causes relatively mild disease in healthy individuals, VZV still causes significant morbidity in children and adults. VZV causes life-threatening disease in immunocompromised individuals such as patients who are elderly or have HIV disease . Herpes zoster affects many elderly individuals and a major complication is prolonged severe pain or post-herpetic neuralgia (PHN), both severely debilitating. The epidemiology of VZV varies geographically. We use a novel strategy for VZV genotyping based on sequencing using DNA amplified from clinical samples. Using this method, more than 400 strains isolated in Czech Republic sorted into discrete geographically distributed genotypes. Recently we continue work on the improvement of the method and we try to find more genotypes in the individual groups. The second part of study 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.



**DEPARTMENT OF MILITARY MEDICAL  
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The Department of Military Medical Service Organization and Management is the primary department which offers military and professional training for the students of the Faculty of Military Health Sciences, particularly in the field of military medical service support in operations, disaster medicine, crisis management, emergency planning and psychology.

Other covered subject areas are military history, military tactics & logistics, military communication, topography and NBC defence.

The Department organizes follow-up education for military doctors, stomatologists, pharmacists and bachelors in advanced courses. Likewise, it offers specialized training and refresher courses for paramedical personnel to the extent necessary to carry out required medical duties in military operations e.g. military medical service organization, medical evacuation and crisis intervention. It participates in preparation of non-medical personnel located within the HQ and staff of the military medical units and facilities. It carries out training in medical support planning, working with maps, deployment of field medical facilities, calculation of medical casualties and military medical units command, control and cooperation.

The subject „Organization and Tactics of the Medical Service“ makes students acquainted with terms and conditions of the medical service during wartime and in foreign operations, identifies tasks and principles of medical support and medical C2 issues that are fundamental to comprehension and correct application of knowledge in terms of other military medical branches. It familiarizes students with the principles followed from NATO documents and standardization agreements.

The Department's primary aim is to pass the knowledge on to students, develop their habits and skills to fulfill basic tasks and duties arising from their planned command functions. It is involved in preparation of medical personnel prior to deployment. The Department provides knowledge and passes previous experience on to control authorities and executive facilities of the medical services in crisis, a war or other emergency situations as well as in humanitarian missions. It applies the knowledge of military subjects to specific environment of medical service, respecting both military principles and requirements as well as the principles of International Humanitarian Law.

The research work of the Department focuses on improving the quality and efficiency of organization and management of the medical service in accordance with military doctrine of the Czech Republic. It contributes in optimization process of the organizational structure of the medical units, departments and facilities, elaborating principles of their operations and methods of their control during a war. It develops materials and proposals from these areas for conceptual authorities of the ACR Medical Service, including NATO STANAG assessment reports in terms of their ratification and options of implementation.

The Department is an expert guarantor in the field of military medical service organization and management. It provides expert statements for the Ministry of Defence and Military Medical Agency and gives consultations to managers of all military medical service levels.

## **RESEARCH PROJECTS**

### **Prehospital emergency care efficiency**

Procházka, M., Halajčuk, T., Hrstka, Z., Ježek, B., Vaněk, J., Mašek, J.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2013–2015 (Project No.: NT14460)

The main research subject of the project is assessment of suitable criteria of Emergency Medical Services (EMS) efficiency evaluation. As a part of the project an analysis of the EMS of Kralovehradecky region will be performed aimed at the economic efficiency as seen by individual EMS stakeholders (health insurance companies, EMS, regional government, Ministry of Health Care), at the EMS medical effects and at the readiness of the EMS in conjunction with the plan of the region coverage by EMS bases. To assess the aptness of the economic efficiency criteria standard economic indicators used in medical facilities will be employed to determine the criteria suitable for EMS providers. The medical effects criteria will be established in a retrospective analysis of the EMS response data. The readiness of the EMS in the region of interest will be considered by criteria extracted from the data on EMS responses including GPS data processed in GIS.

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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 methods, methods of proteomic analysis and 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 as the main objective of the department. The aim of investigation in the medium-term horizon is discovery and practical introduction of bio-dosimetry markers, study of molecular mechanisms of radiation-induced DNA damage repair, development of radioprotection agents as well as continuous 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 workplaces 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 the form of pre-gradual and post-gradual education mainly in doctoral studies. The main educational activity is lecturing military radiobiology. The main topics are: the nuclear weapons effects on the living organism, the possibilities of the protection and medical treatment of irradiated persons. Other specific military issues are disaster medicine, NBC protection etc., which are taught at the Faculty of Military Health Sciences, including the topics, which are presented by the instructors of our department.

## **RESEARCH PROJECTS**

### **BIOMIT: Biodosimetry using human blood lymphocytes mitochondrial DNA alterations**

Badie, C., Tichý, A., Cardiff, E.

Supported by National Institutes of Health, USA, 2014–2015 (Project No.: BIOMIT)

The aim of the BIOMIT study is to monitor accurately mtDNA alterations in human peripheral lymphocytes from patients receiving radiotherapy before, during and after treatment using a new specifically designed multiplex digital PCR assay; results will be compared with apoptosis and dicentric chromosomes' data, which will be obtained simultaneously. We will

assess the specificity, sensitivity and persistence of mtDNA alterations to potentially validate this minimally invasive method to rapidly provide individual dose estimates with high sample throughput. To achieve those goals, three different European partners (PHE Oxford, BRC Hradec Kralove and CREAL Barcelona) with complementary expertises (biology, clinical and epidemiological research and biostatistics) will collaborate in BIOMIT.

**Determination of apoptosis in the bioptic samples taken from the colon**

Kohoutová, D., Pejchal, J., Šmajs, D.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2012–2015 (Project No.: NT13413)

Apoptosis of colonic epithelial cells is of a very low degree in healthy humans. Factors, which influence (increase) apoptosis, have not been satisfactory explained yet. Not only primary disease itself (inflammatory bowel disease, adenoma, carcinoma), but also luminal pH and pH of the mucosa, different expression of blood group antigens, alteration of mucosal prostaglandines and S100 proteins, microbial population, nutrition etc. may play a role in apoptosis. The project will use advanced endoscopic methods, most modern possibilities of apoptosis determination in the bioptic samples (taken during colonoscopy), direct measurement of mucosal pH and bacteriocinogenotypization.

**Phosphoproteomic analysis of leukaemic cells after irradiation**

Tichý, A.

Supported by the Czech Republic Grant Agency, 2012–2014 (Project No.: GPP206/12/P338)

Phosphorylation is one of the most important post-translational modifications, which affects protein structure, function, and localization, regulating majority of biochemical processes. In our previous work we were engaged with molecular mechanisms of response of leukaemic cells MOLT-4 (p53-positive) and HL-60 (p53-negative) to ionising radiation. Submitted project proposes to characterize phosphoproteome of the mentioned cells, i.e. to identify phosphoproteins which are involved in radiation-induced signaling using tandem mass spectrometry, and to propose the potential biodosimetric markers. To date, no study has been published in the presented area mainly due to a very low abundance of phosphoproteins in the cell and due to insufficient ionization during MS analysis (acidic and hydrophilic character) compared to non-modified proteins. Therefore we will employ the newest methods for selective enrichment of phosphopeptides (bioaffinity chromatography) and recent knowledge to increase enrichment efficiency (methylation, pH adjustment etc.).

**Radio-sensibilization of MOLT-4 and SAOS-2 cell lines by DNA repair inhibition: Phosphoproteomic analysis of irradiated cancer cells**

Šalovská, B., Tichý, A.

Supported by Grant Agency of Charles University, 2013–2014 (Project No.: GAUK1220313)

The project is based on the study of phosphorylation – one of the most considerable post-translational modifications. To induce phosphorylation we employ ionizing radiation, which is used in radiotherapy of cancer since its capable of induction of DNA damage and apoptosis. In order to increase radiosensitivity, it is often combined with various radiosensitizers. Hence, the main goal is to compare the effect of three radiosensitizers - KU55339, NU7441, and VE-821 that specifically inhibit key kinases regulating DNA repair after irradiation - ataxia-telangiectasia mutated kinase, DNA-dependent protein kinase a ATM-Rad3-related kinase. Each of these kinases phosphorylates a number of other substrates, some of them specifically and some redundantly and triggers a specific signalling cascade. Consequently, inhibition of DNA repair enzymes increases apoptosis and allows eradication of a cancer cells. Since we use a specific inhibitor for each particular kinase, we aim to exploit mass spectrometry for identification and quantification of proteins involved in the mentioned pathways and to investigate their role in the p53-negative cellular environment.

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

Boštlík, P., Řehulka, P., Pejchal, J., Boštlíková, V., Kročová, Z.

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.

## **DEPARTMENT OF TOXICOLOGY AND MILITARY PHARMACY K-304**

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The Department of Toxicology 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. Department of Toxicology and Military Pharmacy was established on the 1st September 2014 by integration of Department of Toxicology, Centre of Advanced Studies and Department of Public Health. It comprises two groups – a military pharmacy group (biochemical laboratory, laboratory of organic synthesis, analytical laboratory, decontamination laboratory) and a toxicology group (toxicological laboratory, pharmacological laboratory, neurophysiological laboratory, neurobehavioral 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, neurobehavioral, histochemical, pharmacological and neurophysiological level, to study and develop antidotes, to analyze 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 provides and guarantees

the teaching master's degree program military pharmacy and also participates in the teaching of toxicology in disaster medicine.

## **RESEARCH PROJECTS**

### **Improvement of vaccination efficacy by cholinergic anti-inflammatory pathway**

Pohanka, M., Hrabínová, M., Pavlík, M., Boštík, P., Kuča, K.

Supported by the Ministry of Education, Youth and Sports, 2011–2014 (Project No.: LH11023)

Cholinergic antiinflammatory pathway (CAP) is an important tool of regulation of innate immune responses mediated by the parasympathetic nervous system. The project is aimed at evaluating the performance of drugs affecting CAP as vaccine adjuvants. The primary hypothesis is that a suppression of CAP can potentiate the vaccination efficacy. Compound HI-6 inhibiting blood acetylcholinesterase will be tested for control purposes in comparison to drugs triggering CAP. The project will cover the following aspects :in vitro tests of drug effects, examination of effects of tested drugs on immune system alone and co-application of tested drugs with commercially available vaccine in comparison to the effect of the vaccine alone in-vivo in small laboratory animals. Basic immunochemical parameters such as immunoglobulin isotypes M and G, interleukins 2, 4 and 6 and selected biochemical parameters will be assessed. The expected results of project will be improvement of vaccines efficacy and better characterization of CAP as target of the selected drugs.

### **Neurobehavioral evaluation of potential Alzheimer's disease drugs**

Kassa, J., Mišík, J., Kuča, K., Musílek, K., Žďárová Karasová, J. Supported by the Czech Republic Grant Agency, 2012–2015 (Project No.: GAP303/12/0611)

The permanent increasing incidence of Alzheimer`s disease represents a worldwide problem that can be partly solved by introducing more effective drugs. The aim of the study is to characterize the effects of newly developed acetylcholinesterase inhibitors with better pharmacodynamic features derived from the model drug 7-methoxytacrine on nervous functions and especially cognitive functions. The effects of drugs will be evaluated in laboratory rats with the deficiency of cognitive functions induced by administration of 3-chinuclidinylbenzilate. The effects of newly developed drugs will be evaluated by functional observational battery and the potency to eliminate or reduce the deficiency of cognitive functions by special neurobehavioral methods oriented on memory and learning. The effects of new drugs on nervous functions and their potency to eliminate the deficiency of cognitive functions will be compared to the effects of a model drug and standard therapeutics (tacrine, donepezil, rivastigmine). Proposed study can

contribute to the increase of the effectiveness of the treatment of Alzheimer's disease.

**New technologies for identification and typing of biological agents**

Kročová, Z., Boštík, P., Hanovcová, I., Jun, D., Macela, A.

Supported by the Czech Republic Ministry of Internal Affairs, 2012–2015 (Project No.: VF20122015024)

The aim of the project is to develop the methodological procedures for the isolation of bacterial and viral nucleic acids and protein and no-protein toxins from natural matrices, and the procedures for their identification and typing. In the case of bacteria and viruses are designed following the methodological procedures and specific technological and laboratory units: the acquisition and cultivation of biological agents, isolation of genome and plasmid DNA, or RNA in the case of a virus, the methodology and procedures for the preparation of samples of bacterial and viral nucleic acids from complex matrices, design of qPCR primers, probes and the reaction conditions and testing and validation of the proposed methods and procedures for the identification of biological agents. For the detection of low molecular weight toxins will be used high performance liquid chromatography coupled with tandem mass spectrometry and for detection and identification of protein toxins will be used mass spectrometric method SRM (Selected reaction monitoring).

**Novel inhibitors of acetylcholinesterase derived from 7-MEOTA - potential Alzheimer's disease drugs**

Kuča, K., Řípová, D.

Supported by the Czech Republic Grant Agency, 2011–2015 (Project No.: GAP303/11/1907)

Worldwide incidence of AD was evaluated to 35 million of people in 2009. The amount of AD patients in 2050 was estimated to 110 million. The most important factor influencing the increasing amount of AD patients is the age of population (particularly European is rapidly ageing). Thus, the AD is becoming a priority of public health care and there is demand for novel drugs suitable for its treatment. The main aim of this project consist in synthesis and evaluation of novel acetylcholinesterase (AChE) inhibitors derived from 7-MEOTA as potential AD drugs. Synthesized AChE inhibitors will be tested using experimental battery consisting of molecular modelling, biochemical evaluation of AChE inhibitors, antioxidant evaluation of novel drugs, Interactions with muscarinic/nicotinic receptors and choline transporters, in vitro prediction of blood-brain barrier penetration, determination of acute toxicity of selected AChE inhibitors, evaluation of plasmatic levels after experimental administration, evaluation of novel AChE inhibitors in CNS. Based on the appropriately-managed testing system of novel AChE inhibitors, suitable candidate will be selected and recommended for further preclinical trial.

**Preparation and biological evaluation of new therapeutics against to pesticides**

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

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2011–2014 (Project No.: NT12062)

The main aim of this project is to search for new and convenient therapeutics that will be more effective in therapy of pesticide poisoning (pesticides are commonly used organophosphate inhibitors of cholinesterases). New structures will be determined by using highly sophisticated methodology: molecular design. Predicted structures and their analogues will be synthesized. Their therapeutic potency will be tested in *in vitro* studies. The acetylcholinesterase reactivators with the highest reactivation potency will be chosen into *in vivo* tests. During this development process other important data such as LD50 of newly synthesized therapeutics, biochemical studies and pharmacokinetics studies (distribution of newly prepared therapeutics and their ability to penetrate through the blood-brain barrier into central nervous system) will be also replenished. If some effective candidates will be found, subsequent cooperation with foreign institutes is presumed.

**COOPERATION**

In 2014, the Department of Toxicology and Military Pharmacy has continued in the cooperation, started by the Department of Toxicology 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, Taejeon – Korea, Institute for Medical Research and Occupational Health, Zagreb – Croatia, Bundeswehr Institute of Pharmacology and Toxicology, Munich – Germany, Florida International University, Herbert Wertheim College of Medicine in USA, University of St. Andrew, School of Biology in United Kingdom, UAE University, Faculty of Medical Research Sciences in United Arabian Emirates, Semmelweis University, Faculty of Pharmacy in Hungary, Institute de Recherches Biomédical des Armeées in France - in the field of development of prophylactic and therapeutic 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 mutagenesis and carcinogenesis, the Department of Toxicology has also continued in cooperation with the Institute Nutrition Research in Oslo (Norway) and the Institute of Experimental Oncology and the Slovak Health Care University in Bratislava (Slovak Republic). The cooperation with Department of Organic Chemistry, Institute of Chemistry, P. J. Šafárik University in Košice (Slovak Republic), Department of Biophysics, Institute of Experimental Physics, Slovak

Academy of Sciences in Košice (Slovak Republic) and Faculty of Chemical and Food Technology, Slovak Technical University in Bratislava (Slovak Republic) is continuing in the field of the development of new potential therapeutic means against Alzheimer disease.

## **DEPARTMENT OF MILITARY SURGERY K-305**

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## **Structure and main tasks of the department**

1. *Division of General Surgery*  
Šubrt Zdeněk – Head of the Group
2. *Division of Traumatology and Burns Treatment*  
Čáp Robert – Head of the Group

## **Main tasks**

- Undergraduate education of medical students
- Postgraduate training of military surgeons and other medical specialists
- Expertise and referential work for needs of the Czech Armed Forces
- Research in Military Surgery
- Preparation of medical health-care personnel before foreign missions of the Army of the Czech Republic

At present the Department of Military 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, members of the Department perform both, undergraduate courses in field surgery for students of the Faculty of Military Health Sciences, 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. Members of the Department participate in several specialised NATO working groups according to their expertise. Moreover, they are consultants of Surgeon General of the Czech Armed Forces. In the last several years, the Department has played important role in education and training of personnel of field hospitals operating in foreign missions (Yugoslavia, Bosnia-Herzegovina, Albania, Iraq, Afghanistan). Members of the Department also took part in those missions. Research and publication activities are also essential part of the Department members' work.

## **Participation in a foreign mission**

- F. Hošek – UNTS, Zagreb, Croatia, 1996
- A. Ferko – International Hospital, SFOR, Shipovo, Bosnia and Herzegovina, 2001
- R. Čáp – International Hospital, SFOR, Shipovo, Bosnia and Herzegovina, 2001
- A. Ferko – 11th Field Hospital, ISAF, Kabul, Afghanistan, 2002
- J. Páral – 11th Field Hospital, ISAF, Kabul, Afghanistan, 2002, 2011 (TSF)



- M. Plodr – 11th Field Hospital, ISAF, Kabul, Afghanistan, 2002
- I. Žvák – 11th Field Hospital, 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 the Field Hospital, ISAF, Kabul, Afghanistan 2007
- I. Žvák – 1st Contingent of the Field Hospital, ISAF, Kabul, Afghanistan 2007
- J. Páral – Czech Field Surgical Team, International Medical Treatment Facility (Role 3) KAIA, Kabul, Afghanistan 2012
- J. Šimek – Czech Field Surgical Team, International Medical Treatment Facility (Role 3) KAIA, Kabul, Afghanistan 2012

### **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.)
- Handbook of Bandages Technique (Páral)
- Acute Mesenteric Ischemia (Páral)

### **International textbooks**

- Gastrointestinal Stromal Tumors (Páral) in *Aperelho Digestivo* (Coelho), Editora Atheneau, Sao Paulo, Brasília

## **RESEARCH PROJECTS**

### **Parametric monitoring the quality of TME as a tool to reduce local recurrences after surgery for rectal cancer**

Hoch, J., Páral, J.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2012–2015 (Project No.: NT13726)

The aim of the project is to establish and standardize the method of assessing the quality of surgery in the treatment of rectal cancer as a tool to reduce the incidence of local recurrence. The expected outcome will be improving preoperative staging, consistent implementation and improvement procedures TME on those sites, increasing the percentage of complete excision as a basic prerequisite for reducing the rate of local recurrence in rectal cancer.

**Quality evaluation of multimodal treatment in patients with colorectal liver metastatic disease: Multicentric study within Czech complex oncology centres**

Ryska, M., Ferko, A., Šubrt, Z.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2012–2015 (Project No.: NT13660)

The aim of this project is to verify the benefits of a multidisciplinary team approach to comprehensive treatment and evaluation of results for groups of patients defined by selected parameters, compare nationwide data with those of selected comprehensive cancer centers, while respecting the customized approach, to evaluate the cost / benefit and quality of life in patients treated for colorectal cancer liver metastases.

## **DEPARTMENT OF MILITARY INTERNAL MEDICINE AND MILITARY HYGIENE K-306**

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The department is divided into the group of Military Internal Medicine and the group of Military Hygiene.

### **Military Internal Medicine**

The group of Military Internal Medicine is the clinical part of the department, systematically focused on specialized part of Internal Medicine – Military Internal Medicine. The Military Internal Medicine as a subspeciality of Internal Medicine has been progressively developed into a recent shape and purpose. In accordance with latest trends of military health supply and modern therapeutic approaches, the Military Internal Medicine provides knowledge and practical experience in treatment of life-threatening non-surgical impairment in specific conditions of the military, especially during the armed conflicts. Nowadays Internal Medicine is also of increasing importance in postoperative care, where multidisciplinary approach leads to improved prognosis of the most severe surgical affections. Furthermore, knowledge and practical experience in Military Internal Medicine are also useful during peacetime, especially in large-scale disasters – catastrophes. In fact, most of the skills obtained in Military Internal Medicine training are useful in a novel and progressive branch of medical specialization – **Disaster Medicine**.

Military Internal Medicine is focused on three basic areas of activities: therapeutic and preventive, educational and teaching and scientific and research.

**Therapeutic and preventive activities** are essential for Military Internal Medicine. They provide specialized knowledge and experience in treatment of the most severe medical affections. The group of Military Internal Medicine cooperates with Internal Departments of the University Hospital in Hradec Kralove, which serves as a therapeutic and educational background.

### **Military Hygiene**

The branch of Military Hygiene follows living and working conditions of troops with the aim to develop, propose and assert measures for health protection and promotion of military professionals in order to maintain a good health state of troops and combat capability of the Army of the Czech Republic personnel in difficult conditions of military environment. In accordance with this function, the activity of the group of Military Hygiene is aimed at monitoring the impact of environmental factors on the organism, at evaluating their risk in working and living environment and at setting effective preventive measures to protect and promote health of soldiers.

Currently, the group of Military Hygiene complexly covers the basic issues of the relation of life and job environment and health of the individual.

The group can provide the analysis of selected physical and chemical factors of external environment in conditions of the Army of the Czech

Republic. It studies the possibilities of use of chemical substances for disinfection effects. The group 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.

In the area of group of Military 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 properly received and consumed

### **Cooperation**

- Charles University, Faculty of Medicine in Hradec Kralove
- University Hospital Hradec Kralove
- Institute for Postgraduate Medical Education in Prague
- Health Institute in Hradec Kralove
- Hygienic Station in Liberec
- Military Health Institute in Prague
- Main hygienist of the Ministry of Defence
- Silesian University in Opava
- Agricultural University in Nitra, Slovakia

### **Teaching**

#### Military Internal Medicine

**Educational and teaching activities** of the group of Military Internal Medicine are closely related to therapeutic and preventive care. The department provides comprehensive education of Internal Medicine and Military Internal Medicine in both undergraduate and postgraduate degree programmes. Almost all military medical specialists in Internal Medicine, including both Czechoslovak and Czech Army members, completed their postgraduate education of Internal Medicine at our department and gained the specialization degree in Internal Medicine. We are proud to announce that during the history of our department we assisted more than 1500 physicians with gaining the specialization degree in Internal Medicine.

Nowadays, the educational process involves undergraduate education in Military Internal Medicine, Military Dentistry, Military Pharmacy and Military Health Assistant. The group of Military Internal Medicine participates actively in teaching in specialized courses, such as BATLS (Battlefield Advanced Trauma Life Support) and also provides medical support during specialized training operations to various units of the Army of the Czech Republic. In cooperation with the Internal Department of the Military University Hospital, Prague and the Internal Departments of other military hospitals, the department provides necessary background for physicians in the military to gain the medical postgraduate certification in Internal Medicine.

Important and highly demanding assignment of the department is management and support of doctoral study programme Military Internal Medicine. This study programme has been accredited since 1993. The department is also accredited for associate professor and professor degrees proceedings in the field of Military Internal Medicine.

#### Military Hygiene

The group of Military Hygiene takes part in undergraduate education of military hygiene and preventive medicine for all military students of the Faculty of Military Health Sciences including civilian students of the Faculty of Health Sciences in Pardubice. The group members participate in teaching at Charles University, the Faculty of Medicine in Hradec Kralove and covering the final exam in hygiene, military hygiene and epidemiology.

The group can provide education of hygiene and preventive medicine in the doctoral study programme Preventive medicine and health care.

The group takes part in education of hygiene and preventive medicine for civilian and military doctors and nurses, as well as the members of NATO missions.

The group cooperates with the Military Academy in Vyskov and covers education and specialized attachments for the employees of the Ministry of Defence in the field of hygiene of work, occupational medicine and risk prevention.

#### **Research**

##### Military Internal Medicine

**Scientific and research activities** represent the third main area of the group of Military Internal Medicine. In general, the department is focused on clinical research in internal medicine and its implementation in specific military practice. The research is aimed at meeting requirements of the Army of the Czech Republic including field and foreign military operations.

The shape of our recent research activities was formed together with the development of organization structure of the department. The long history and development of our department was connected with the development of public society, the Army and both schools in Hradec Kralove: the University of Defence, the Faculty of Military Health Sciences and Charles University, the Faculty of Medicine.

#### **Main topics are:**

- New trends in transplantation of hematopoietic stem cells and supportive care
- Optimization and individualization of treatment of disorders involving bone marrow and hematopoiesis, especially research in acute leukemias as a “model disease“

- Monitoring of side effects during treatment of hematologic disorders using various novel biochemical markers, especially for evaluation cardiac toxicity
- Cardiovascular research with focus on acute coronary syndromes, heart failure and valve disorders
- The role of enteral and parenteral nutrition in intensive care
- Participation in international clinical trials, especially in fields of hematology and cardiology

### **Cooperation in clinical research**

1. Hematopoietic stem cell transplantation (HSCT), transplant-related complications and supportive care, the role of cytokines, cytokine receptors and adhesion molecules in HSCT and acute leukemia – the project has continued.
2. Complex monitoring of cardiotoxicity of antitumorous treatment, mainly cardiac biomarkers – the research project has continued.
3. New biochemical markers of cardiac injury (natriuretic peptides, cardiac troponins, heart-type fatty acid binding protein, glycogen phosphorylase BB) – clinical and laboratory evaluation has continued.
4. Analysis of transplantation activities, indications and results in the Czech Republic – National Stem Cell Transplantation Registry – the project has continued.
5. A study on application of enteral and parenteral nutrition in intensive metabolic care has been initiated.
6. Double blind, randomized, placebo-controlled multicentre phase III clinical study followed by open-label phase on the efficacy and tolerability of Budesonide 3 mg effervescent tablet in patients with resistant oral chronic GVHD.
7. A phase III, double-blind, randomized, placebo-controlled, multicenter clinical trial to study the safety, tolerability, efficacy, and immunogenicity of V212/heat-treated varicella-zoster virus (VZV) vaccine in recipients of autologous hematopoietic cell transplants (HCTs).
8. An open-label, randomized phase 3 study of Inotuzumab Ozogamicin compared to a defined investigator's choice in adult patients with relapsed or refractory CD22-positive acute lymphoblastic leukemia (ALL). (Protocol number: B1931022)
9. A phase 3, randomized, open label study investigating the efficacy of the BiTE antibody Blinatumomab versus standard of care chemotherapy in adult subjects with relapsed/refractory B-precursor acute lymphoblastic leukemia (ALL). (Protocol number: AMG 103 00103311, TOWER)



### Military Hygiene

Scientific research is focused on primary prevention of chronic diseases and relation of life and job environment and life style. Realization of intervention study and project focused on healthy status of professional soldiers.

#### **Main topics are:**

- Epidemiological studies of non infectious diseases
- Evaluation of nutritional and healthy
- Evaluation of energetic and metabolic requirements
- Combat rations in different climatic conditions
- Evaluation of response of the organism to work in unfavourable environmental and working conditions
- Evaluation of working energy expenditure
- Evaluation of physiological function in protective suits
- Elaboration of proposals for the working and rest regimes, energy, fluids and minerals as a prevention of diseases

#### **Cooperation in research**

1. The project of intervention and prevention of overweight and obesity in soldiers of the Army of the Czech Republic  
Main researcher – the Department of Military Medicine of Ministry of Defence, co-investigator – Vladimír Pavlík, M.D., the project since 2011 to 2014, could be prolonged.
2. The proposal of the new combat rations for the tropical climatic condition Main researcher – Ludek Novak Ing., MEDIAP company, co-investigator Vladimír Pavlík, M.D., the project since 2012 to 2015.

## **RESEARCH PROJECTS**

### **Quality of life measurement and its influence to overall survival in hematopoietic stem cell transplantation in CZ**

Trněný, M., Novák, J., Válková, V., Jebavý, L., Sedláček, P.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2010–2015 (Project No.: NT11299)

The aim of our project is to document quality of life in transplanted patients using standardised QOL questionnaires. Based on this monitoring, we would like to propose a supportive psychological and social program for individual institutions so that the monitoring of QOL will become an integral part of standard medical practice.

## **DEPARTMENT OF EMERGENCY MEDICINE AND MILITARY GENERAL MEDICINE K-307**

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History of the Department started in 1983 at the J. E. Purkyně Military Medical Research and Postgraduate Institute. First as a Group of Military Medical Service Organization in Peacetime which was a part of the Department of Military Medical Service Organization. With increasing demands on training of the military health personnel, the Department of General Medicine was established. First Specialization Exams in this new basic specialization branch were held in February 1985. 525 military doctors passed the Specialization Exam in General Medicine at the Department of General Medicine till 31st December 2004. Now the Department collaborates in Specialization Exam 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.

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 Military Medical Service after the entry into NATO was one of the main contributors of the Czech Armed Forces to this international military organization. The Department of General Medicine and Emergency Medicine has been charged with specialization training of the military health personnel deployed on foreign mission. 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.

A new period of the Department started in 2014. After restructuring of the University of Defence and the Faculty of Military Health Science together with prevailing teaching topics in urgent medicine, the Department was renamed on the Department of Emergency Medicine and Military General Medicine. It consists of two groups – the Group of Emergency Medicine and the Group of General Medicine.

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 offers a lot of useful knowledge and skills, e. g. control life-threatening external hemorrhage, airway management and decompress the chest.

The Department of Emergency Medicine and Military General 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.

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 Department is a co-ordinating centre 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 services 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.

## **DEPARTMENT OF MOLECULAR PATHOLOGY AND BIOLOGY K-308**

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The Department of Molecular Pathology and Biology is a research and educational center focused on the application of advanced technologies of functional genomics to bio-medical defense 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 signaling and gene expression by ongoing infection. The favorite 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. 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, PhD. 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.

The Department traditionally cooperated with the military medical and research facility in Sweden (FOI NBC-Defence, Umea) and Germany (Military Medical Academy, Munich) on preparation of *Francisella tularensis* knock-outs and detection and identification of microorganisms. 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, U.S. Army Medical Research Institute of Infectious Disease (Fort Detrick, USA) – preparation and testing of bacterial proteins with immunostimulatory potential and, finally Department of Microbiology and Parasitology, University of Rijeka – microscopical analysis of microbial intracellular trafficking, Molecular Infection Medicine, University of Umea, Sweden – analysis of host-pathogen interactions. Within the frame of the Czech Republic, the Institute has useful contacts with the Institute of Microbiology, Czech Academy of Science, Prague, the Faculty of Science, Charles University, Prague, the Faculty of Medicine and Faculty of Pharmacy Charles University, Hradec Králové, the University Hospital in Hradec Králové, 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, Ministry of Education and Youth and Sports and Ministry of the Interior. Currently, the Department for Molecular Pathology and Biology has 16 full-time permanent employees, 13 scientists, 2 technicians and 1 administrative worker. The Department has currently 9 PhD students and, furthermore, several undergraduates have been working on their diploma thesis in the Institute.

## **RESEARCH PROJECTS**

### **Characterization of the diagnostic potential of native polypeptides in amniotic fluid**

Lenčo, J., Kacerovský, J., Tambor, V., Žďárová Karasová, J.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2012–2015 (Project No.: NT13599)

Preterm premature rupture of membranes (PPROM) is a principal cause of preterm births and considerably increases perinatal morbidity and mortality. The main reason is the causal link with intraamniotic infection (IAI), which occurs in 40-60% of PPRM patients. The most serious cases of IAI may result in fetal inflammatory response (FIRS) and cause permanent health consequences for the newborn or end up by the death of the fetus. FIRS is very often subclinical and thus frequently remains undetected. Currently, there is no tool for its precise prenatal diagnostics available. The project is focused on characterization of the diagnostic potential of native amniotic fluid polypeptides with regard to detection of IAI and FIRS.

**Identification of novel *Francisella tularensis* targets for subunit vaccine development**

Stulík, J., Worsham, P.

Supported by the Defense Threat Reduction Agency, 2011–2014 (Project No.: D-CZ-10-0001)

To develop a subunit vaccine for tularemia. Specifically, this project focuses on (1) the identification of surface associated or secreted virulence factors from *F. tularensis* using immunoproteomic approaches (2) cloning and expression of these gene products, (3) confirming the role of the selected targets in virulence, and (4) assessing these proteins as protective antigens in animal models.

**Improvement of vaccination efficacy by cholinergic anti-inflammatory pathway**

Pohanka, M., Hrabínová, M., Pavlík, M., Boščík, P., Kuča, K.

Supported by the Ministry of Education, Youth and Sports, 2011–2014 (Project No.: LH11023)

Cholinergic antiinflammatory pathway (CAP) is an important tool of regulation of innate immune responses mediated by the parasympathetic nervous system. The project is aimed at evaluating the performance of drugs affecting CAP as vaccine adjuvants. The primary hypothesis is that a suppression of CAP can potentiate the vaccination efficacy. Compound HI-6 inhibiting blood acetylcholinesterase will be tested for control purposes in comparison to drugs triggering CAP. The project will cover the following aspects :in vitro tests of drug effects, examination of effects of tested drugs on immune system alone and co-application of tested drugs with commercially available vaccine in comparison to the effect of the vaccine alone in-vivo in small laboratory animals. Basic immunochemical parameters such as immunoglobulin isotypes M and G, interleukins 2, 4 and 6 and selected biochemical parameters will be assessed. The expected results of project will be improvement of vaccines efficacy and better characterization of CAP as target of the selected drugs.



**New technologies for identification and typing of biological agents**

Kročová, Z., Boštlík, P., Hanovcová, I., Jun, D., Macela, A.

Supported by the Czech Republic Ministry of Internal Affairs, 2012–2015 (Project No.: VF20122015024)

The aim of the project is to develop the methodological procedures for the isolation of bacterial and viral nucleic acids and protein and no-protein toxins from natural matrices, and the procedures for their identification and typing. In the case of bacteria and viruses are designed following the methodological procedures and specific technological and laboratory units: the acquisition and cultivation of biological agents, isolation of genome and plasmid DNA, or RNA in the case of a virus, the methodology and procedures for the preparation of samples of bacterial and viral nucleic acids from complex matrices, design of qPCR primers, probes and the reaction conditions and testing and validation of the proposed methods and procedures for the identification of biological agents. For the detection of low molecular weight toxins will be used high performance liquid chromatography coupled with tandem mass spectrometry and for detection and identification of protein toxins will be used mass spectrometric method SRM (Selected reaction monitoring).

**Preparation and biological evaluation of new therapeutics against to pesticides**

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

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2011–2014 (Project No.: NT12062)

The main aim of this project is to search for new and convenient therapeutics that will be more effective in therapy of pesticide poisoning (pesticides are commonly used organophosphate inhibitors of cholinesterases). New structures will be determined by using highly sophisticated methodology: molecular design. Predicted structures and their analogues will be synthesized. Their therapeutic potency will be tested in in vitro studies. The acetylcholinesterase reactivators with the highest reactivation potency will be chosen into in vivo tests. During this development process other important data such as LD50 of newly synthesized therapeutics, biochemical studies and pharmacokinetics studies (distribution of newly prepared therapeutics and their ability to penetrate through the blood-brain barrier into central nervous system) will be also replenished. If some effective candidates will be found, subsequent cooperation with foreign institutes is presumed.

**Targeted proteomic analysis in hypertrophic cardiomyopathy**

Stulík, J., Fučíková, A.

Supported by the Internal Grant Agency of the Czech Republic Health Service, 2012–2015 (Project No.: NT13721)

The basic objective of the proposed project is to verify the analytical potential of selected biomarkers of peripheral blood for diagnostics of hypertrophic cardiomyopathy. In our previous study, we used quantitative proteomics to identify 40 proteins in plasma. The plasma concentrations of these proteins were significantly different compare to control group. The scope of the proposed project is the verification and validation of the concentration of these proteins in peripheral blood of patients with hypertrophic cardiomyopathy; the comparison of the results with the healthy population and other diseases that are accompanied by structural changes in the myocardium (dilated cardiomyopathy, ischemic heart disease, arterial hypertension and aortic stenosis). The project will use commercially available kits based on the detection and quantification using antibodies and antibody-independent method for proteomic SRM (Selected Reaction Monitoring).

**The role of B cells during natural and adaptive phase of immune response against *Francisella tularensis* infection in mice**

Kročová, Z.

Supported by the Czech Republic Grant Agency, 2011–2014 (Project No.: GAP302/11/1631)

Tularemia is a zoonotic infection with high infectivity and high morbidity. The etiological agent of tularemia is *Francisella tularensis*, an intracellular pathogen on all major lists of potential bioterroristic agents. The live vaccine strain without the license for human use is still the only problematic tool for the immunoprophylaxis. In spite of a growing number of studies dedicated to immunity against tularemia, the mechanisms participating in the protective response remain mostly unknown. Especially the role of B cells and specific antibodies is a recently hot topic of debate. For this reason the proposal of this project covers the aims concerning the mechanisms by which B cells and antibodies participate in protective response, e.g. antigen presenting function, production of specific antibodies during the T-independent phase of innate response, B cell mediated immunological memory and the existence of an analogy of ADCC where bacteria are the targets. No direct experimental evidence exists for the participation of these phenomena in protective immunity against tularemia.

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

Boštlík, P., Řehulka, P., Pejchal, J., Boštlíková, V., Kročová, Z.

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.

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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 Vice-Dean for Research.

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

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. 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.

On December 30, 2010 the Vivarium was accredited for use again for 5 years (till 30 December 2015) by the Central Board for Animal Protection .

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**

### **Improvement of vaccination efficacy by cholinergic anti-inflammatory pathway**

Pohanka, M., Hrabínová, M., Pavlík, M., Boštík, P., Kuča, K.

Supported by the Ministry of Education, Youth and Sports, 2011–2014 (Project No.: LH11023)

Cholinergic antiinflammatory pathway (CAP) is an important tool of regulation of innate immune responses mediated by the parasympathetic nervous system. The project is aimed at evaluating the performance of drugs affecting CAP as vaccine adjuvants. The primary hypothesis is that a suppression of CAP can potentiate the vaccination efficacy. Compound HI-6 inhibiting blood acetylcholinesterase will be tested for control purposes in comparison to drugs triggering CAP. The project will cover the following aspects :in vitro tests of drug effects, examination of effects of tested drugs on immune system alone and co-application of tested drugs with commercially available vaccine in comparison to the effect of the vaccine alone in-vivo in small laboratory animals. Basic immunochemical parameters such as immunoglobulin isotypes M and G, interleukins 2, 4 and 6 and selected biochemical parameters will be assessed. The expected results of project will be improvement of vaccines efficacy and better characterization of CAP as target of the selected drugs.

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The Communication and Information Systems Office 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 Communication and Information Systems Office consists of the Group of Computer Applications and the Library of Faculty.

**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://fvz.unob.cz>). The printing-office of the Communication and Information

Systems Offices able to cover reprographic and printing needs of the Faculty by its own sources in limited extent.

**The library** 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 80 000 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 (PhD.) by giving lectures in Basics of Informatics focused on retrievals, processing and publication of scientific information.

## **VISITORS TO THE FACULTY OF MILITARY HEALTH SCIENCES**

### **Hungary**

- JEKÖ Anita (Semmelweis University) (Budapest) – Erasmus, 01 November 2013–01 February 2014

### **Serbia**

- DJORDJEVIĆ Snežana (Military Medical Academy, National Poison Control Center, Specialist for Toxicological Chemistry), STOJANOVIĆ Filip, BOJANIĆ Miloš, MACAK Monika (Medical Faculty of the Military Medical Academy, University of Defence of Belgrade) (Belgrade) – Talks on the cooperation in the field of transfer of technologies, 09 September 2014–26 September 2014



## **VISITS ABROAD**

### **Australia**

- Lochman, P. (2014 GSA Annual Scientific Meeting Emergency Surgery: A New Paradigm, Perth, 22 September 2014–30 September 2014)
- Páral, J. (2014 GSA Annual Scientific Meeting Emergency Surgery: A New Paradigm, Perth, 22 September 2014–30 September 2014)
- Šubrt, Z. (2014 GSA Annual Scientific Meeting Emergency Surgery: A New Paradigm, Perth, 22 September 2014–30 September 2014)

### **Austria**

- Chlíbek, R. (16th ISW-TBE Annual Conference, Vienna, 29 January 2014–31 January 2014)
- Chlíbek, R. (CEVAG Meeting, Vienna, 12 April 2014–13 April 2014)
- Chlíbek, R. (21th CEVAG Meeting, Vienna, 14 November 2014–15 November 2014)
- Řehulka, P. (MassSpec-Forum-Vienna-2014, Vienna, 18 February 2014–19 February 2014)
- Řehulka, P. (Late summer practical proteomics seminar, Vienna, 27 August 2014–28 August 2014)

### **Belgium**

- Kassa, J. (35th NATO CBRN Medical Working Group Meeting, Brussels, 09 February 2014–14 February 2014)
- Pejchal, J. (35th NATO CBRN Medical Working Group Meeting, Brussels, 09 February 2014–14 January 2014)

### **Croatia**

- Boštíková, V. (Cooperation between RECOOP, USA and FVZ, Split, 05 May 2014–10 May 2014)
- Schmidt, M. (Cooperation between RECOOP, USA and FVZ, Split, 27 May 2014–01 June 2014)

### **France**

- Ďurišová, K. (FEBS EMBO 2014, Paris, 29 August 2014–05 September 2014)
- Marek, J. (Polygone Scintifique – Institut de Biologie Structurale, Grenoble, 01 February 2014–18 April 2014)

### **Georgia**

- Kuča, K. (World Congress on CBRNe Science & Consequence Management, Tbilisi, 01 June 2014–05 June 2014)
- Soukup, O. (World Congress on CBRNe Science & Consequence Management, Tbilisi, 01 June 2014–06 June 2014)

### **Germany**

- Kassa, J. (27th ECNP Congress, Berlin, 18 December 2014–22 December 2014)
- Pohanka, M. (7th International Conference on Emerging Zoonoses, Berlin, 16 September 2014–17 September 2014)

### **Greece**

- Kročová, Z. (7th International Conference on Innate Immunity, Olympia, 01 June 2014–06 June 2014)
- Pohanka, M. (1st International Congress: From Drug Discovery to Drug Delivery, Athens, 13 November 2014–15 November 2014)
- Zárybnická, L. (41st Annual Meeting of the European Radiation Society, Rhodes, Greece, 13 September 2014–19 September 2014)

### **Guatemala**

- Boštíková, V. (CDC Advisory Board, Antigua, 01 September 2014–05 September 2014)
- Špliňo, M. (CDC Advisory Board, Antigua, 01 September 2014–05 September 2014)

### **Hungary**

- Blažek, P. (15th IEEE International Symposium on Computational Intelligence and Informatics, Budapest, 19 November 2014–21 November 2014)
- Dušek, T. (Force Health Protection NATO Conference 2014, Budapest, 23 June 2014–27 June 2014)

### **China**

- Boštíková, V. (BIT's 4th Annual World Congress of Microbes 2014, Dalian, 27 July 2014–29 July 2014)

**India**

- Chlíbek, R. (9th International Symposium on Pneumococci and Pneumococcal Diseases, Hyderabad, 09 March 2014–14 March 2014)
- Smetana, J. (9th International Symposium on Pneumococci and Pneumococcal Diseases, Hyderabad, 09 March 2014–14 March 2014)

**Israel**

- Klein, L. (NATO Advanced Research Workshop: Hospitals Under Fire – Planning and Operating a Hospital Under Fire and Extreme Circumstances, Haifa, 16 November 2014–21 November 2014)

**Italy**

- Horáček, J. (19th Congress of EHA (European Hematology Association), Milan, 10 June 2014–15 June 2014)
- Jebavý, L. (40th Annual Meeting of the European Group for Blood and Marrow Transplantation (EBMT), Milan, 29 March 2014–02 April 2014)
- Kuča, K. (Workshop on Italy – Czech Cooperation on AD and Other Related Topics, Bologna, 29 September 2014–29 September 2014)
- Střítecká, H. (GCP training and training for examiners clinical evaluation of drugs, Roma, 24 January 2014–26 January 2014)

**Malaysia**

- Střítecká, H. (ICO 2014, Kuala Lumpur, 15 March 2014–22 March 2014)

**Poland**

- Chlíbek, R. (CEEPAG 4th Meeting, Krakow, 19 February 2014–21 February 2014)
- Prymula, R. (CEEPAG 4th Meeting, Krakow, 19 February 2014–21 February 2014)

**Portugal**

- Boštíková, V. (Grants cooperation, University Coimbra, 01 April 2014–05 April 2014)
- Fejfarová, M. (Grant cooperation with university of Coimbra, Coimbra, 01 April 2014–05 April 2014)
- Kuča, K. (22nd International Symposium on Medicinal Chemistry, Lisbon, 07 September 2014–11 September 2014)
- Kupsa, T. (6th International Conference on Myeloproliferative Neoplasms, Estoril, 23 October 2014–25 October 2014)

## **VISIT ABROAD**

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- Páral, J. (Multidisciplinary ESGAR/ESCP workshop on bowel diseases: the role of imaging, Lisbon, 11 December 2014–14 December 2014)
- Schmidt, M. (Grants cooperation, Coimbra, 01 April 2014–05 April 2014)

### **Serbia**

- Pavlík, V. (Work activities, Belgrade, 18 August 2014–05 September 2014)

### **Slovakia**

- Boštík, P. (Lecture HIV/AIDS, Bratislava, 27 November 2014–27 November 2014)
- Chlíbek, R. (5th Slovak Immunisation Congress, Štrbské Pleso, 15 January 2014–18 January 2014)
- KASSA, J. (TOXCON 2014: Connecting for Safer Europe, Stará Lesná, 23 September 2014–26 September 2014)
- Pavlík, V. (Work activities, Bratislava, 07 April 2014–09 April 2014)
- Pohanka, M. (TOXCON 2014: Connecting for Safer Europe, Stará Lesná, 24 September 2014–26 September 2014)
- Soukup, O. (TOXCON 2014: Connecting for Safer Europe, Stará Lesná, 24 September 2014–26 September 2014)
- Šepsová, V. (TOXCON 2014: Connecting for Safer Europe, Stará Lesná, 24 September 2014–26 September 2014)
- Šepsová, V. (64. Farmakologické dni, Martin, 25 June 2014–27 June 2014)

### **Spain**

- Dušek, T. (ESCP's 9th Scientific and Annual Meeting, Barcelona, 23 September 2014–27 September 2014)
- Pohanka, M. (3rd International Conference on Antimicrobial Research – ICAR2014, Madrid, 01 October 2014–03 October 2014)
- Pohanka, M. (180th OMICS Group Conference on Bioprocess and Engineering, Valencia, 26 June 2014–27 June 2014)
- Řehulka, P. (13th Human Proteome Organization World Congress (HUPO 2014), Madrid, 05 October 2014–08 October 2014)
- Střítecká, H. (IACON, Gran Canaria, 08 November 2014–13 November 2014)
- Tichý, A. (Meeting of low-dose radiation initiative MELODI, Barcelona, 07 October 2014–09 October 2014)

**Sweden**

- Ďuriřov, K. (CELOD: Cellular Effects of Low Doses and Low Dose-Rates with Focus on DNA Damage and Stress Response, Stockholm, 30 March 2014–11 April 2014)
- Klein, L. (236th Human Factor in Medicine Panel Symposium, NATO - STO, Stockholm, 06 April 2014–09 April 2014)

**Thailand**

- Řehulka, P. (7th AOHUPO Congress/9th PST International Symposium – Frontiers in Protein and Proteomics Research, Bangkok, 06 August 2014–09 August 2014)

**The Netherlands**

- Lochman, P. (RICH and EuraHS – Bridging the Gap – Evidence based research versus clinical practice, Rotterdam, 10 December 2014–13 December 2014)

**Turkey**

- Chlbek, R. (WHO European Regional Meeting of National Immunization Programme Managers, Antalya, 17 March 2014–20 March 2014)

**United Kingdom**

- Kubelkov, K. (2014 Innate Immunity Summit, London, 09 November 2014–12 November 2014)
- Pohanka, M. (50th Congress on the European Societies of Toxicology (EUROTOX), Edinburgh, 07 September 2014–10 September 2014)
- Sleha, R. (32nd Annual Meeting of the European Society for Paediatric Infectious Diseases, Dublin, 08 April 2014–08 April 2014)
- Tich, A. (Collaboration agreement with Public Health England, Oxford, 10 February 2014–12 February 2014)

**United States**

- Bořtk, P. (Emory University, Atlanta, 04 December 2014–04 December 2014)
- Bořtk, P. (Emory University, Atlanta, 23 November 2014–29 November 2014)
- Bořtk, P. (4th World Congress of Virology, San Antonio, 06 October 2014–08 October 2014)
- Bořtkov, V. (CDC, Atlanta, 01 December 2014–05 December 2014)

- Horáček, J. (56th Annual Meeting of American Society of Hematology (ASH), San Francisco, 04 December 2014–11 December 2014)
- Jakl, M. (Internship at Centre for Research and Innovation, Heart and Vascular Institute Cleveland, Cleveland, 08 February 2014–03 May 2014)
- Kassa, J. (19th Biennial US Army Medical Defense – Bioscience Review, Hunt Valley, 11 May 2014–16 May 2014)
- Kročová, Z. (International Conference on B-1 cell Development and Function., Tarrytown, 16 June 2014–20 June 2014)
- Kubelková, K. (2nd International Congress on Bacteriology and Infectious Diseases, Chicago, 16 November 2014–20 November 2014)
- Kuča, K. (Bioscience Review 2014, Hunt Valley, 02 December 2014–06 December 2014)
- Pejchal, J. (NATO HFM-222, Bethesda, 16 January 2014–18 January 2014)
- Řehulka, P. (10th Annual Conference – Frontiers in Proteomics: Advancing Biology through Technology and Computation, Seattle, 06 April 2014–09 April 2014)
- Soukup, O. (Neurodegenerative Diseases: Biology & Therapeutics, Cold Spring Harbor, 02 December 2014–08 December 2014)
- Soukup, O. (Bioscience Review 2014, Hunt Valley, 11 May 2014–06 June 2014)
- Šepsová, V. (Neurodegenerative Diseases: Biology & Therapeutics, Cold Spring Harbor, 02 December 2014–08 December 2014)
- Šinkorová, Z. (Active participation on congress, Fort Lauderdale, 17 May 2014–21 May 2014)
- Tichý, A. (62nd Conference of American Society for Mass Spectrometry, 15 June 2014–19 June 2014)

## **WORKSHOPS, COURSES, RESIDENCIES AT THE FACULTY IN 2014**

### **Radiobiology**

- Specialized course – radiation accident – protection and measures, 19 May 2014–20 May 2014

### **Military Hygiene**

- Specialized basic course – Teaching on foodstuff I, 31 March 2014–01 April 2014
- Seminar - Health protection at work with risk factors of microclimatic conditions, 17 September 2014–17 September 2014
- Specialized course – Prevention of non-infectious diseases of mass incidence, 17 March 2014–18 March 2014
- Specialized course – Evaluation of workload and health protection at work, 03 November 2014–04 November 2014
- Specialized course – Health support programme, 03 February 2014–04 February 2014
- Specialized course – Nutrition support of patients with overweight and obesity, 10 March 2014–12 March 2014, 24 November 2014–26 November 2014
- Specialized follow-up course – Teaching on foodstuff II, 29 September 2014–30 September 2014
- Seminar – Ensuring and fulfilling work classification tasks, 20 November 2014–20 November 2014
- Specialized course – Evaluation of the nutritional state of the organism, 13 January 2014–14 January 2014
- Seminar – Occupational medical services in the Ministry of Defence, 04 March 2014–04 March 2014, 16 September 2014–16 September 2014, 19 November 2014–19 November 2014

### **Language Courses**

- Refresher language courses – English (STANAG 2), 17 February 2014–28 March 2014, 20 October 2014–03 December 2014
- Combined language courses – English (STANAG 3), 09 September 2013–30 May 2014, 08 September 2014–22 May 2015
- Intensive language courses – English (STANAG 1), 06 January 2014–11 April 2014, 14 April 2014–18 July 2014, 08 September 2014–12 December 2014
- Refresher language courses – English (STANAG 1), 06 January 2014–14 February 2014, 31 March 2014–16 May 2014, 08 September 2014–17 October 2014

## **WORKSHOPS, COURSES, RESIDENCIES AT THE FACULTY IN 2014**

- Medical English conversation course, 10 February 2014–21 February 2014, 20 October 2014–17 October 2014
- Combined language courses – English (STANAG 2), 09 September 2013–30 May 2014, 08 September 2014–22 May 2015

### **Military Epidemiology**

- Specialized course – Epidemiology of new infectious diseases, 21 January 2014–23 January 2014
- Specialized course – Current infectious diseases – news in epidemiology and microbiology, 21 October 2014–23 October 2014
- Specialized course – Infectious diseases prevention, 11 November 2014–13 November 2014
- Specialized course – Vaccination in adulthood, 25 March 2014–26 March 2014

### **Military Medical Service Organization**

- Course for officers – Military health service organization and management, 06 January 2014–02 May 2014
- Specialized warrant officer's course for non-medical personnel, 07 April 2014–13 June 2014
- Specialized course of aeromedical evacuation, 15 April 2014–17 April 2014
- Senior staff officer course – Military health service organization and management, 16 September 2013–27 June 2014
- Specialized course – Psychology and crisis psychological interventions, management of patients with behavioral difficulties, 10 March 2014–12 March 2014, 13 October 2014–15 October 2014
- MEDEVAC specialized course – Use of helicopter, 06 October 2014–10 October 2014
- Senior staff officer course – Military health service organization and management, 16 September 2013–27 June 2014, 01 September 2014–13 June 2015
- Specialized course – Prevention of burn out syndrome, 10 February 2014–12 March 2014, 03 November 2014–05 November 2014

### **Computing**

- Special course – MS PowerPoint and Internet, 06 January 2014–10 January 2014, 06 October 2014–10 October 2014
- Special course – MS Access database, 27 January 2014–31 January 2014
- Special course – MS Windows and MS Word, 13 January 2014–17 January 2014



## **WORKSHOPS, COURSES, RESIDENCIES AT THE FACULTY IN 2014**

- Refresher course in MS Word, 26 May 2014–28 May 2014
- Special Course – Statistics and data processing in MS Excel, 17 March 2014–21 March 2014, 09 June 2014–13 June 2014

### **General Medicine**

- Specialized course – Battlefield Advanced Resuscitation Techniques and Skills (R - BARTS), 06 October 2014–08 October 2014
- Specialized course – Teaching methodology of health training, 07 April 2014–11 April 2014
- Specialized course – Battlefield Advanced Trauma Life Support (BATLS), 10 February 2014–12 March 2014, 31 March 2014–02 April 2014, 28 April 2014–30 April 2014, 03 November 2014–05 November 2014
- Specialized course of first aid in field conditions, 13 January 2014–17 January 2014, 20 January 2014–24 January 2014, 03 February 2014–07 February 2014, 17 February 2014–21 February 2014, 01 September 2014–05 September 2014, 22 September 2014–25 September 2014, 29 September 2014–03 October 2014, 13 October 2014–17 October 2014, 20 October 2014–24 October 2014
- Specialized course – Battlefield Advanced Resuscitation Techniques and Skills (BARTS), 10 March 2014–12 February 2014, 31 March 2014–02 April 2014, 28 April 2014–30 April 2014, 03 November 2014–05 November 2014
- Special course of health training for Military High School Moravska Trebova, 02 June 2014–05 June 2014, 09 June 2014–12 June 2014, 16 June 2014–19 June 2014
- Specialized course – Defibrillators and their operation, 09 January 2014–09 January 2014, 13 February 2014–13 February 2014, 11 September 2014–11 September 2014, 06 November 2014–06 November 2014
- Specialized course in first aid in the field for Police of the Czech Republic, 14 April 2014–18 April 2014
- Specialized course for CLS instructors, 16 June 2014–20 June 2014
- Specialized course for non-medical workers – Defibrillators and their operation, 14 February 2014–14 February 2014
- Special course in extended first aid in the field (CLS Course), 03 March 2014–14 March 2014, 17 March 2014–29 March 2014, 02 June 2014–13 June 2014
- Special course – Repetitory of extended first aid in field conditions (R-CLS Course), 08 December 2014–12 December 2014
- Special course in extended first aid in the field for the Police of the Czech Republic (CLS Course), 12 May 2014–23 May 2014

## ***WORKSHOPS, COURSES, RESIDENCIES AT THE FACULTY IN 2014***

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- Specialized course – Retention – Battlefield Advanced Trauma Life Support (R – BATLS), 06 October 2014–08 October 2014

### **Multidisciplinary Studies**

- Preparatory course for entrance examination, 09 June 2014–14 June 2014
- Specialized course – Dealing with extremely dangerous poisons, drugs and psychotropic substances, 03 February 2014–06 February 2014, 03 March 2014–06 March 2014, 29 September 2014–03 October 2014

## **INTERNATIONAL COOPERATION**

### **Cooperation at the military medical facility level**

#### **Austria**

- Baxter, Vienna
- Center of Biomolecular Medicine & Pharmacology, Medical University of Vienna, Vienna
- Institute of Chemical Technologies and Analytics, Vienna University of Technology, Vienna

#### **Belgium**

- GlaxoSmithKline Biologicals, Rixensart

#### **Croatia**

- Department of Microbiology and Parasitology, University of Rijeka, Rijeka
- Institute for Medical Research and Occupational Health, Zagreb

#### **France**

- Aventis Pasteur MSD, Lyon
- Saint Louis Hospital, Paris

#### **Germany**

- Department of Solid States Nuclear Physics, University of Leipzig, Leipzig

#### **Hungary**

- Semmelweis University, Budapest

#### **Mongolia**

- National Research Center for Infectious Diseases, Ministry of Health, Ulaanbaatar

#### **Norway**

- Department of Nutrition, Medical Faculty, University of Oslo, Oslo

#### **Poland**

- WIHE, Dr Zdanowski – Zakład Farmakologii i Toksykologii, Warsaw

#### **Portugal**

- University of Coimbra, Department of Pharmacology, Coimbra

#### **Republic of Korea**

- Medicinal Science Division, Korea Research Institute of Chemical Technology, Daejeon

## ***INTERNATIONAL COOPERATION***

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### **Russian Federation**

- M. V. Lomonosov Moscow State University, Moscow

### **Slovakia**

- Institute of Experimental Oncology, Bratislava
- P. J. Šafárik University, Košice
- Slovak Medical University, Bratislava

### **Sweden**

- University of Umea, Umea

### **Switzerland**

- Institute of Molecular Systems Biology, Zurich

### **United Arab Emirates**

- United Arab Emirates University, Prof. Lorke – Faculty of Medicine and Health Sciences – Department of Anatomy, Al-Ain

### **United Kingdom**

- Health Protection Agency, Porton Down
- University of St. Andrews, St. Andrews, Scotland

### **United States**

- Emory University, Department of Pathology, Atlanta
- Merck & Co., Inc, Whitehouse Station
- MMRHVLB/CCID/CDC, Atlanta
- University of Washington, Seattle
- 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
- National Institute of Health, Food and Drug Administration, Centre of Biological Evaluation and Research, Bethesda, Maryland
- U.S. Army Medical Research Institute of Infectious Disease, Fort Detrick

**Other expert commissions**

- J. Bajgar – member of Editorial board of *„Archives of Hygiene and Industrial Toxicology“*
- R. Blanař – member of NATO RTO, Human Factors and Medicine – Exploratory Team *„Information Technology and Models for Crisis Detection, Monitoring and Response“*
- R. Blanař – member of NATO (COMEDS-MMSOP)
- P. Bořtík – national coordinator for CBRN of Cap Tech ESM04 EDA
- P. Bořtík – member of Regional Cooperation for Health Science and Technology
- P. Bořtík – member of Editorial board of *„the Open Infectious Diseases Journal“*
- P. Bořtík – member of the Association of UICC Fellows
- P. Bořtík – member of the American Association of Immunologists (AAI)
- P. Bořtík – member of the Federation of American Societies for Experimental Biology
- P. Bořtík – member of the American Society of Microbiology
- V. Bořtíková – International Board for the Investigation and Control of Influenza and Other Epidemic Diseases
- V. Bořtíková – member of Editorial board of *„Journal of Clinical Virology“*
- R. Chlábek – European Centre for Disease Control (ECDC) – member of Potential shortages of Vaccines and treatment for rare communicable diseases in Europe Group
- R. Chlábek – European Centre for Disease Control (ECDC) – member of Expert Panel Hepatitis A
- R. Chlábek – member of GPI – Global Pertussis Initiative
- R. Chlábek. – member of NATO – Biological Medical Advisory Committee
- R. Chlábek – member of NATO HFMP (Human Factor Medicine Panel)
- R. Chlábek – supervisor of CEVAG (Central European Vaccination Awareness Group)
- R. Chlábek – member of Central and Eastern Europe Pertussis Awareness Group
- R. Chlábek. – member of C.O.P.E. – Consensus on Pertussis Booster Vaccination in Europe
- 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*“
- J. Kassa – member of Editorial board of „*Challenge Medical CBRN Defense International*“
- L. Klein – member of Editorial board of „*Annals of Burns and Fire Disasters*“
- L. Klein – member of NATO HFMP
- K. Kuča – member of Editorial board of „*Jacobs Journal of Medicine Chemistry*“
- K. Kuča – member of Editorial board of „*Jacobs Journal of Drug Metabolism and Toxicology*“
- K. Kuča – member of Editorial board of „*Proteomics & Bioinformatics*“
- K. Kuča – member of Editorial board of „*Surgical Sciences*“
- K. Kuča – member of Editorial board of „*Research in Pharmaceutical Biotechnology*“
- K. Kuča – member of Editorial board of „*ISRN Pharmaceutics*“
- K. Kuča – member of Editorial board of „*World Journal of Methodology*“
- K. Kuča – member of Editorial board of „*World Journal of Translational Medicine*“
- K. Kuča – member of Editorial board of „*the Open Enzyme Inhibition Journal*“
- K. Kuča – consultant of Research Network Management Working Group; Cedar-Sinai RECOOP HST Consortium
- K. Kuča – consultant of Guidepoint Global Advisors
- K. Kuča – member of Editorial board of „*Advances in Economics*“
- K. Kuča – member of Editorial board of „*Advances in Materials Science and Applications*“
- K. Kuča – member of Editorial board of „*Biochemistry & Physiology*“
- K. Kuča – member of Editorial board of „*Journal of Biosafety*“
- K. Kuča – member of Editorial board of „*Journal of Biowar & Defence*“
- K. Kuča – member of Editorial board of „*Journal of Business Administration and Education*“
- K. Kuča – member of Editorial board of „*Journal of Environment and Human*“
- K. Kuča – member of Editorial board of „*Journal of Molecular Biomarkers & Diagnosis*“
- J. Pejchal – member of NATO CBRN Medical Working Group
- J. Pejchal – member of NATO RTO HFM - 222

- M. Pohanka – member of Editorial board of „*Journal of Biosafety*“
- M. Pohanka – member of Editorial board of „*Journal of Biosensors and Bioelectronics*“
- M. Pohanka – member of Editorial board of „*Journal of Bioterrorism and Biodefense*“
- M. Pohanka – member of Editorial board of „*Journal of Obesity & Weight loss Therapy*“
- M. Pohanka – member of Editorial board of „*BioMed Research International*“
- M. Pohanka – member of Editorial board of „*International Journal of Drug Discovery*“
- M. Pohanka – member of Editorial board of International „*Journal of Health, Safety and Environments*“
- M. Pohanka – member of Editorial board of „*Journal of Clinical Trials*“
- M. Pohanka – member of Editorial board of „*Microbial and Biochemical Technology*“
- M. Pohanka – member of Editorial board of „*Journal of Pharmaceutics and Drug Development*“
- M. Pohanka – member of Editorial board of „*MOJ Proteomics and Bioinformatics*“
- M. Pohanka – member of Editorial board of „*Journal of Mellomics and Nanotechnologies*“
- M. Pohanka – member of Editorial board of „*American Journal of Bioterrorism, Biosecurity and Biodefense*“
- M. Pohanka – member of Editorial board of „*International Journal of Bioweapons, Biocrimes and Bioterrorism*“
- M. Pohanka – member of Editorial board of „*Machines Review*“
- M. Pohanka – member of Editorial board of „*JSM Enzymology and Protein Science*“
- M. Pohanka – member of Editorial board of „*Austin Journal of Bioorganic and Organic Chemistry*“
- M. Pohanka – member of Editorial board of „*Journal of Immune Research*“
- M. Pohanka – member of Editorial board of „*Symbiosis Journal of Veterinary Sciences*“
- M. Pohanka – member of Editorial board of „*Austin Biomarkers and Diagnosis*“
- M. Pohanka – member of Editorial board of „*Global Journal of Allergy*“
- M. Pohanka – member of Editorial board of „*Austin Journal of Biosensors and Bioelectronics*“
- M. Pohanka – member of Editorial board of „*Jacobs Journal of Enzymology and Enzyme Engineering*“

## **INTERNATIONAL COOPERATION**

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- M. Pohanka – member of Editorial board of „*Journal of Clinical Microbiology and Case Reports*”
- R. Prymula – member of ESWI (European Scientific Working Group on Influenza)
- R. Prymula – member of Global Awareness Board on Pneumococcal Vaccines
- R. Prymula – chairman of CEVAG (Central European Vaccine Advisory Group)
- R. Prymula – member of Management Board of ECDC
- R. Prymula – member of European Rotavirus Speakers’ Bureau
- R. Prymula – member of Steering Committee ECDC
- R. Prymula – member of CEEPAG
- J. Smetana – member of Rotavirus Vaccination Advisory Board GlaxoSmithKline Biologicals
- H. Střítecká – member of Editorial board of „*Journal of Obesity & Weight loss Therapy*”
- H. Střítecká – member of Editorial board „*Journal of Food Security*”
- J. Stulík – member of Editorial board of „*Frontiers in Cellular and Infection Microbiology*”
- M. Špliňo – International Board for the Investigation and Control of Influenza and Other Epidemic Diseases
- M. Špliňo – European Study Group on Nosocomial Infection



## SCIENTIFIC AND RESEARCH ACTIVITIES

### Dissertation defences

#### Hedlová Dana

- Hospital Hygiene and Occupational Health & Safety Department, Military University Hospital Prague

*study programmes:* Epidemiology

*dissertation:* Study of nosocomial infections in the Surgical Clinic, 2nd Medical Faculty, Charles University and Military University Hospital Prague

#### Stefanová Magdalena

- Department of Gastroenterology, Military University Hospital Prague

*study programmes:* Military Internal Medicine

*dissertation:* Modern enhancement endoscopic methods in of the diagnosis of early neoplasia of the gastroesophageal junction

#### Kašaová Linda

- Department of Oncology and Radiotherapy, University Hospital Hradec Králové

*study programmes:* Military Radiobiology

*dissertation:* Quantitative evaluation of the benefit of fiducial image-guidance for prostate cancer radiation therapy

### **Fajfr Miroslav**

- Military Medical Agency, Hradec Králové

*study programmes:* Medical Microbiology

*dissertation:* Technique of direct detection and identification of viral hemorrhagic fever causative agents

### **Drtinová Lucie**

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

*study programmes:* Toxicology

*dissertation:* Testing of new potencial substances for the treatment of Alzheimer's Disease

### **Čečetková Beáta**

- Department of Hospital Hygiene and Epidemiology, Thomayer Hospital, Prague

*study programmes:* Epidemiology

*dissertation:* Prevalence study on nosocomial infections in the faculty hospitals of the Czech Republic

# **THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE FACULTY OF MILITARY HEALTH SCIENCES IN 2014**

## **THE INTERNAL GRANT AGENCY OF THE CZECH REPUBLIC HEALTH SERVICE**

### ***Principal investigators***

#### **Jiří Stulík**

(NT13721) Targeted proteomic analysis in hypertrophic cardiomyopathy

#### **Kamil Kuča**

(NT12062) Preparation and biological evaluation of new therapeutics against to pesticides

#### **Juraj Lenčo**

(NT13599) Characterization of the diagnostic potential of native polypeptides in amniotic fluid

#### **Miroslav Procházka**

(NT14460) Prehospital emergency care efficiency

### ***Co-investigators***

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## ***THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE FACULTY OF MILITARY HEALTH SCIENCES IN 2014***

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(NT11299) Quality of life measurement and its influence to overall survival in hematopoietic stem cell transplantation in CZ

### **Jaroslav Pejchal**

(NT13413) Determination of apoptosis in the bioptic samples taken from the colon

### **Zdeněk Šubrt**

(NT13660) Quality evaluation of multimodal treatment in patients with colorectal liver metastatic disease: Mutlicentric study within Czech complex oncology centres

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(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

#### **Roman Chlábek**

**THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE  
FACULTY OF MILITARY HEALTH SCIENCES IN 2014**

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(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

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**THE CZECH REPUBLIC MINISTRY OF INTERNAL AFFAIRS**

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(VF20122015024) New technologies for identification and typing of biological agents

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**THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE  
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(D-CZ-10-0001) Identification of novel Francisella tularensis targets for subunit vaccine development

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***Principal investigators***

**Pavel Bošík**

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

**Kamil Kuča**

(GAP303/11/1907) Novel inhibitors of acetylcholinesterase derived from 7-MEOTA – potential Alzheimer's disease drugs

**Zuzana Kročová**

(GAP302/11/1631) The role of B cells during natural and adaptive phase of immune response against *Francisella tularensis* infection in mice

**Jiří Kassa**

(GAP303/12/0611) Neurobehavioral evaluation of potential Alzheimer's disease drugs

**Aleš Tichý**

(GPP206/12/P338) Phosphoproteomic analysis of leukaemic cells after irradiation

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**Vanda Bošíková**

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

**THE REVIEW OF RESEARCH PROJECTS CARRIED OUT AT THE  
FACULTY OF MILITARY HEALTH SCIENCES IN 2014**

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**Jan Misík**

(GAP303/12/0611) Neurobehavioral evaluation of potential Alzheimer's disease drugs

**Kamil Kuča**

(GAP303/12/0611) Neurobehavioral evaluation of potential Alzheimer's disease drugs

**Kamil Musílek**

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**THE MINISTRY OF EDUCATION, YOUTH AND SPORTS**

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(LH11023) Improvement of vaccination efficacy by cholinergic anti-inflammatory pathway

**Pavel Boštík**

(LH11019) Correlation of expression of KIR alleles in NK cells in GALT and disease progression in SIV non-human primate model of AIDS

***Co-investigators***

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(LH11023) Improvement of vaccination efficacy by cholinergic anti-inflammatory pathway

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**Pavel Boštík**

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**Michal Pavlík**

(LH11023) Improvement of vaccination efficacy by cholinergic anti-inflammatory pathway

**Vanda Boštková**

(LH11019) Correlation of expression of KIR alleles in NK cells in GALT and disease progression in SIV non-human primate model of AIDS

**RESEARCH AIMS**

**Jiří Kassa**

A long-term organization development plan 1011 – Health problems of the weapons of mass destruction

**Jiří Páral**

A long-term organization development plan 1011 – Clinical fields

## ARTICLES IN JOURNALS WITH IMPACT FACTOR

1. ANDRŠ, M., KORÁBEČNÝ, J., NEPOVIMOVÁ, E., JUN, D., HODNÝ, Z., MORAVCOVÁ, S., HANZLIKOVÁ, H., KUČA, K. The development of ataxia telangiectasia mutated kinase inhibitors. *Mini Reviews in Medicinal Chemistry*. 2014, **14**(10), 805–811. ISSN 1389-5575. IF **3.186**
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9. DAŇKOVÁ, V., BALONOVÁ, L., STRAŠKOVÁ, A., ŠPIDLOVÁ, P., PUTZOVÁ, D., KIJEK, T., BOZUE, J., COTE, C., MOU, S., WORSHAM, P., SZOTAKOVA, B., ČERVENÝ, L., STULÍK, J. Characterization of tetratricopeptide repeat-like proteins in *Francisella tularensis* and identification of a novel locus required for virulence. *Infection and Immunity*. 2014, **82**(12), 5035–5048. ISSN 0019-9567. IF **4.156**
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11. DRTINOVÁ, L., DOBEŠ, P., POHANKA, M. Low molecular weight precursor applicable for Alzheimer disease drugs synthesis (AChE and BChE inhibition, BACE inhibition, antioxidant properties and in silico modulation). *Journal of Applied Biomedicine - print*. 2014, **12**(4), 285–290. ISSN 1214-021X. IF **1.775**
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15. FARKAŠ, R., ĎATKOVÁ, Z., MENTELOVÁ, L., LOW, P., BEŇOVÁ-LISZEKOVÁ, D., BEŇO, M., SASS, M., ŘEHULKA, P., ŘEHULKOVÁ, H., RAŠKA, O., KOVÁČIK, L., ŠMIGOVÁ, J., RAŠKA, I., MECHLER, B.M. Apocrine secretion in *Drosophila* salivary glands: subcellular origin, dynamics, and identification of secretory proteins. *PLoS One*. 2014, **9**(4), Art. no. e94383. ISSN 1932-6203. IF **3.534**
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- compared with the non-Roma population in the eastern part of Slovakia. *Central European Journal of Public Health*. 2014, **22**(Suppl.), S69–S74. ISSN 1210-7778. IF **0.798**
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- outcome in patients with acute coronary syndrome. *Anadolu Kardiyoloji Dergisi-The Anatolian Journal of Cardiology*. 2014, **14**(1), 85–86. ISSN 1302-8723. IF **0.755**
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35. KASSA, J., ŠEPSOVÁ, V., TŮMOVÁ, M. A comparison of the reactivating and therapeutic efficacy of two novel oximes K378 and K458 with currently available oximes in rats and mice poisoned with sarin. *Journal of Applied Biomedicine - print*. 2014, **12**(3), 155–160. ISSN 1214-021X. IF **1.775**
36. KASSA, J., ŠEPSOVÁ, V., TŮMOVÁ, M., MUSÍLEK, K., HOROVÁ, A. The evaluation of the reactivating and therapeutic efficacy of two novel oximes (K361 and K378) in comparison with the oxime K203 and trimedoxime in tabun-poisoned rats and mice. *Toxicology Mechanisms and Methods*. 2014, **24**(3), 173–178. ISSN 1537-6516. IF **1.548**
37. KASSA, J., ŽĐÁROVÁ KARASOVÁ, J., KUČA, K., MUSÍLEK, K., JUNG, Y. Comparison of the neuroprotective effects of a novel bispyridinium oxime KR-22934 with the oxime K203 and obidoxime in tabun-poisoned male rats. *Journal of Applied Biomedicine - print*. 2014, **12**(2), 111–117. ISSN 1214-021X. IF **1.775**
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- muscarinic receptor antagonists in the urinary bladder of the rat. *Clinical and Experimental Pharmacology and Physiology*. 2014, **41**(2), 139–146. ISSN 1440-1681. IF **2.405**
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44. KORÁBEČNÝ, J., SOUKUP, O., DOLEŽAL, R., ŠPILOVSKÁ, K., NEPOVIMOVÁ, E., ANDRŠ, M., NGUYEN, TD., JUN, D., MUSÍLEK, K., KUČEROVÁ-CHLUPÁČOVÁ, M., KUČA, K. From pyridinium-based to centrally active acetylcholinesterase reactivators. *Mini Reviews in Medicinal Chemistry*. 2014, **14**(3), 215–221. ISSN 1389-5575. IF **3.186**
45. KRAČMAROVÁ, A., POHANKA, M. Electrochemical determination of low-molecular-weight antioxidants in blood serum. *Chemické listy*. 2014, **108**(1), 64–69. ISSN 0009-2770. IF **0.196**
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