

**UNIVERZITA KARLOVA V PRAZE,  
LÉKAŘSKÁ FAKULTA V HRADCI KRÁLOVÉ  
A  
FAKULTNÍ NEMOCNICE V HRADCI KRÁLOVÉ**

**VI. VĚDECKÁ KONFERENCE**

**P R O G R A M**



**23. ledna 2002**

**Velká posluchárna teoretických ústavů Lékařské fakulty UK,  
Šimkova 870, Hradec Králové**

## **T e c h n i c k é   p o k y n y**

***Vědecká konference je zároveň částí oponentního řízení grantů následujících grantových agentur:***

Grantové agentury České republiky

Grantové agentury Univerzity Karlovy

Interní grantové agentury Ministerstva zdravotnictví ČR

***V programu jsou uvedeny názvy řešených projektů a jména odpovědných řešitelů.***

### ***Ústní sdělení***

1. Doba sdělení 10 minut, diskuse 5 minut.
2. K dispozici je projekce diapositivů 5 x 5 cm, zpětná projekce, video a dataprojekce.
3. Materiály k projekci se předávají nejpozději 15 minut před začátkem sekce v místnosti č. 14 vedle velké posluchárny.

### ***Plakátová sdělení***

Postery budou vyvěšeny po celou dobu konání konference. Prohlídka plakátových sdělení je možná v průběhu přestávek.

Po tuto dobu bude u panelu přítomen řešitel nebo spoluřešitel projektu.

**Středa 23. 1. 2002**

8.00 - 8.15

**Z a h á j e n í k o n f e r e n c e**

**prof. MUDr. Ivo Šteiner, CSc., děkan lékařské fakulty**  
**doc. MUDr. Leoš Heger, CSc., ředitel fakultní nemocnice**

**Sekce I**

**Předsedající: doc. RNDr. Jan Krejsek, CSc.**

8.15 - 8.30

Úloha fenotypu a genotypu familiární hyperlipoproteinémie v procesu atherogeneze u ischemické choroby srdeční  
**doc. MUDr. Vladimír Bláha, CSc.**  
IGA MZ ČR NB/5205-3 (FN)

8.30 - 8.45

Chronická gastritida indukovaná infekcí *Helicobacter pylori* a autoimunitními mechanismy – zdroj dyspeptických obtíží?  
**prof. MUDr. Bohumil Fixa, DrSc.**  
IGA MZ ČR NK/6174-2 (LF)

8.45 – 9.00

Vztah bilance tekutin k neuromuskulárním poruchám u kriticky nemocných  
**MUDr. Jan Maňák**  
IGA MZ ČR NB/5197-3 (FN)

9.00 – 9.15

Neurální transplantace do experimentálního modelu Huntingtonovy choroby  
**doc. MUDr. Yvona Mazurová, CSc.**  
IGA MZ ČR NF/5400-3 (LF)

9.15 - 9.30

Možnost ovlivnění restenosis implantací radioaktivních stentů s velmi nízkou, cyklotronem navozenou aktivitou  
**MUDr. Josef Št'ásek, Ph.D.**  
IGA MZ ČR NA/4786-3 (LF)

9.30 - 9.45

Stanovení funkční aktivity a fenotypu tumor infiltrujících lymfocytů u nemocných s ovariálními tumory  
**Mgr. Miroslava Toušková**  
IGA MZ ČR NH/5196-3 (FN)

9.45 - 10.15

***P ř e s t á v k a - občerstvení, prohlídka plakátových sdělení***

**Sekce II**

10.15 - 10.30

**Předsedající: doc. MUDr. Vladimír Geršl, CSc.**

Testování střevní propustnosti při modelovém poškození střeva a jater

**doc. MUDr. Zuzana Červinková, CSc.**

GA UK 1/99 (LF)

10.30 - 10.45

Farmakokinetika nízkodávkovaného metotrexátu u pacientů s psoriázou, podaného v časných stádiích onemocnění

**MUDr. Jiří Grim**

GA UK 9/99 (LF)

10.45 – 11.00

Troponin u dětí s vrozenými srdečními vadami

**MUDr. Michaela Adamcová, CSc.**

GA ČR 305/98/P261 (LF)

11.00 – 11.15

Vliv poměru arteriální a portální perfúze jater na inzulínovou rezistenci a jaterní funkce při jaterní cirhóze

**MUDr. Václav Šafka, Ph.D.**

GA ČR 306/99/P014 (LF)

11.15 - 11.30

Analýza vydechovaných plynů pro sledování metabolických poruch a účinků nutričních substrátů pomocí GC/MS systému

**prof. MUDr. Zdeněk Zadák, CSc.**

(odp. řešitel: prof. Ing. Jiří Gasparič, DrSc., Univerzita Karlova v Praze, Farmaceutická fakulta v Hradci Králové )

GA ČR 203/99/1165 (LF)

11.30 – 12.00

***P ř e s t á v k a - občerstvení, prohlídka plakátových sdělení***

**U k o n ě n í k o n f e r e n c e**

**prof. MUDr. RNDr. Miroslav Červinka, CSc.,**

**proděkan lékařské fakulty pro vědu a výzkum**

## VÝZKUMNÉ ZÁMĚRY PREZENTOVANÉ FORMOU PLAKÁTOVÝCH SDĚLENÍ

1. - 4. Závažná orgánová selhání: experimentální a klinické aspekty, možnosti prevence a terapeutického ovlivnění  
koordinátor: **prof. MUDr. RNDr. Miroslav Červinka, CSc.**  
MSM 111500001 (LF)
5. - 6. Hepatologie - fyziologické, patofyziologické a klinické aspekty  
koordinátor: **doc. MUDr. Zuzana Červinková, CSc.**  
Výzkumný záměr MSM 111500003 (LF)
7. - 8. Patogeneze, diagnostika a terapie nádorových onemocnění  
koordinátor: **prof. MUDr. Jaroslav Malý, CSc.**  
Výzkumný záměr MSM 111500002 (LF)

---

## PROJEKTY PREZENTOVANÉ FORMOU PLAKÁTOVÝCH SDĚLENÍ

9. Adenomy hypofýzy kultivované in vitro: vliv somatostatinových analogů a induktorů apoptózy  
**MUDr. Jan Čáp, CSc.**  
IGA MZ ČR NB/6172-3 (LF)
10. Histopatologie středního ucha u fetu a novorozence  
**MUDr. Viktor Chrobok, Ph.D.**  
IGA MZ ČR NK/6189-3 (FN)
11. Význam efektivní atriální kontrakce pro sekvenční stimulaci  
**prof. MUDr. Jiří Kvasnička, CSc.**  
IGA MZ ČR NA/5403-3 (LF)

12. Vliv transparence nitrooční čočky na rozlišovací schopnost oka

**MUDr. Hana Langrová, Ph.D.**

GA ČR 309/00/D056 (LF)

13. "Human Brain Project" R 01 MH/DA 57351

- spolupráce s Harvard Medical School

**prof. MUDr. Josef Špaček, DrSc.**

(odpovědný řešitel: Kristen M. Harris, Ph.D., Harvard Medical School)

14. Interakce 7-methoxytarcinu a galanthaminu s vybranými neuroprotektivy

**prof. MUDr. Vladimír Palička, CSc.**

IGA MZ ČR NL/6091-3 (FN)

**NA LF UK A FN V HRADCI KRÁLOVÉ SE V ROCE 2001 DÁLE ŘEŠILY  
NÁSLEDUJÍCÍ PROJEKTY**

(abecedně podle jmen řešitelů)

*V tomto přehledu nejsou uvedeny všechny smluvně podložené spolupráce na projektech, jejichž odpovědní řešitelé jsou z jiných organizací než z LF UK a FN v Hradci Králové.*

1. Porovnání dostupných metod aplikace lokálních anestetik ve stomatologii  
**MUDr. Věra Bartáková, CSc.**  
FRVŠ 1719 (LF)
2. Praktická materiálová problematika ve výuce protetické technologie  
**doc. MUDr. Jiří Bittner, CSc.**  
FRVŠ 1740 (LF)
3. Úloha metabolické, endoteliální a trombocytární dysfunkce v procesu atherogenesy  
**prof. MUDr. Milan Bláha, CSc.**  
IGA MZ ČR NB/6549-3 (FN)
4. Studium aterogenních mechanismů při léčbě LDL-aférezou úloha metabolismu mastných kyselin, syntézy cholesterolu a lipoperoxidace  
**doc. MUDr. Vladimír Bláha, CSc.**  
IGA MZ ČR NB/6822-3 (FN)
5. Užití nízkomolekulárního heparinu během perkutánní transluminální koronární angioplastiky (PTCA)  
**MUDr. Miroslav Brtko**  
IGA MZ ČR NA/6579-3 (FN)
6. Porovnání výskytu neurovaskulárních kompresí v oblasti rostrální ventrolaterální medully u hypertoniků a normotoniků. Prospektivní MR studie.  
**MUDr. Jiří Ceral, Ph.D.**  
IGA MZ ČR NA/6169-3 (LF)
7. Zavedení výpočetní techniky do řešení praktických úloh z lékařské biochemie  
**doc. MUDr. Jaroslav Cerman, CSc.**  
FRVŠ 1739 (LF)
8. Proteomové centrum pro studium intracelulárního parazitismu bakterií  
**prof. MUDr. RNDr. Miroslav Červinka, CSc.**  
(nositel: Vojenská lékařská akademie JEP, Hradec Králové,  
odp. řešitel: MUDr. Jiří Stulík, CSc.)  
Výzkumná centra LN00-A033 (LF)

9. Nové látky chelatující železo – problematika jejich kardiovaskulárních, potenciálně kardioprotektivních a biotransformačních účinků  
**doc. MUDr. Vladimír Geršl, CSc.**  
GA ČR 305/00/0365 (LF)
10. Vliv acidózy na metabolismus proteinů a aminokyselin  
**doc. MUDr. Milan Holeček, DrSc.**  
GA ČR 305/01/0578 (LF)
11. Vliv aminokyselin a hormonů na metabolismus proteinů u katabolických stavů  
**doc. MUDr. Milan Holeček, DrSc.**  
IGA MZ ČR NB/6793-3 (LF)
12. Multimediální počítačové zpracování a prezentace soudnělékařské expertízy  
**doc. MUDr. Petr Hottmar, CSc.**  
FRVŠ 1737 (LF)
13. Vliv potažení stentu na výskyt stenóz u nemocných léčených metodou transjugulární intrahepatální portosystémové spojky – TIPS – část II. Prospektivní, randomizovaná, kontrolovaná studie  
**doc. MUDr. Petr Hůlek, CSc.**  
IGA MZ ČR NA/6767-3 (LF)
14. Stanovení isoprenu ve vydechaném vzduchu - interpretace vyšetření a zavedení do klinického výzkumu poruch metabolismu cholesterolu  
**MUDr. Radomír Hyšpler, Ph.D.**  
GA ČR 203/01/P110 (LF)
15. Přínos stanovení dipeptidylpeptidázy IV (DPP IV) v diferenciální diagnostice tumorů štítné žlázy  
**MUDr. Ivana Kholová**  
GA UK 87/00 (LF)
16. Digitalizace obrazové dokumentace pro inovaci výuky biologie stomatologů  
**MUDr. Jana Kolářová, CSc.**  
FRVŠ 1736 (LF)
17. Výukový model adaptace organismu na zátěž  
**doc. MUDr. Miroslav Kuba, CSc.**  
FRVŠ 1732 (LF)
18. Electrophysiological Assessment of Human Cognitive Processes  
**doc. MUDr. Miroslav Kuba, CSc.**  
Společný výzkumný projekt s Fyziologickými laboratořemi Univerzity v Oxfordu (contractor - Prof. Colin Blakemore): Grant James S. McDonnell Foundation for Cognitive Neurosciences - USA  
99-57EE-GLO.04 (LF)



19. Porovnání úspěšnosti nepovlakovaných a částečně povlakovaných implantátů v kombinaci s transpozicí nervus alveolaris inferior  
**MUDr. Jiří Krug, Ph.D.**  
GA ČR 304/01/P111 (LF)
20. Kontinuální biochemické monitorování pacientů během kardiochirurgické operace v mimotělním oběhu a v časném pooperačním období užitím intersticiální mikrodiálýzy  
**MUDr. Jiří Mand'ák**  
IGA MZ ČR NB/6547-3 (FN)
21. Inovace lékařského kurikula (s ohledem na vstup do Evropské unie).  
koordinátor: **prof. PhDr. Jiří Mareš, CSc.**  
Výzkumný záměr CEZ:J13/98:111500005 (LF)
22. Sociální opora u dětí a dospívajících v psychicky náročných situacích  
**prof. PhDr. Jiří Mareš, CSc.**  
GA ČR 406/01/0659 (LF)
23. Screening a diagnostika dědičných poruch glykosylace  
**MUDr. Eliška Marklová, CSc.**  
GA UK 85/01 (LF)
24. Inovace výuky farmakologie v návaznosti na evropský projekt EPHARNET  
**prof. MUDr. Jiřina Martínková, CSc.**  
FRVŠ 1731 (LF)
25. Populační modelování chtěných a nechtěných klinických výstupů a náhradních parametrů  
**prof. MUDr. Jiřina Martínková, CSc.**  
COST OC B15.10 (LF)
26. Modelování kinetiky a dynamiky léků při jejich vývoji. Metody in vitro a in vivo.  
**prof. MUDr. Jiřina Martínková, CSc.**  
COST OC B15.30 (LF)
27. Připojení VŠ kolejí Na kotli k internetu pomocí metropolitní sítě HKNET  
**MUDr. Vladimír Mašín**  
FRVŠ 1743 (LF)
28. Charakteristika diferenciačního potenciálu neurálních kmenových buněk  
**doc. MUDr. Jaroslav Mokrý, Ph.D.**  
GA ČR 304/00/0338 (LF)
29. Digitální mikroskopie: modernizace praktické výuky histologie a embryologie  
**doc. MUDr. Jaroslav Mokrý, Ph.D.**  
FRVŠ 1742 (LF)

30. Imunohistochemická detekce nestinu jakožto diagnostického markeru v patomorfologii  
**doc. MUDr. Jaroslav Mokrý, Ph.D.**  
IGA MZ ČR NK/6727-3 (LF)
31. Aktivní formy kyslíku v patogenezi akutní pankreatitidy a možnost ovlivnění antioxidanty  
**MUDr. František Musil**  
IGA MZ ČR NB/6043-3 (FN)
32. Zavedení imunohistochemických technik do rutinní výuky histologie  
**prof. MUDr. Stanislav Němeček, DrSc.**  
FRVŠ 1729 (LF)
33. Změny hemostázy při katetrizační radiofrekvenční ablaci  
**MUDr. Petr Pařízek**  
IGA MZ ČR NA/6603-3 (LF)
34. Rekonstrukce kloubních povrchů použitím autologních osteochondrálních štěpů, autologních kultur chondrocytů v suspenzi a na bioaktivním sklokeramickém nosiči. Experimentální klinická studie.  
**MUDr. Jaroslav Pavlata**  
IGA MZ ČR ND/6042-3 (FN)
35. Příprava digitální videosekvencí pro výuku buněčné biologie  
**MUDr. Jan Pechl**  
FRVŠ 1728 (LF)
36. Zavedení předmětu *Topografická anatomie hlavy a krku* do stomatologického kurikula  
**MUDr. Olga Procházková**  
FRVŠ 1727 (LF)
37. Aplikace 13C dechových testů do klinické praxe v pediatrii  
**doc. MUDr. Oldřich Pozler, CSc.**  
IGA MZ ČR NE/6164-3 (LF)
38. Aktualizace a digitalizace sbírky preparátů pro výuku buněčné biologie  
**Mgr. Emil Rudolf, Ph.D.**  
FRVŠ 1726 (LF)
39. Rozšíření a inovace Pedagogicko-psychologické poradny LF UK v Hradci Králové  
**PhDr. Marie Rybářová**  
FRVŠ 1741 (LF)
40. Inovace praktických cvičení z mikrobiologie - multimediální programy  
**doc. MUDr. Olga Ryšková, CSc.**  
FRVŠ 1725 (LF)

41. Porovnání vlivu glutaminu a kyseliny glutamové během parenterální výživy  
**doc. MUDr. Luboš Sobotka, CSc.**  
IGA MZ ČR NB/6755-2 (LF)
42. Význam monitorování metabolismu lipidů procesu stárnutí  
**RNDr. Dagmar Solichová**  
IGA MZ ČR NG/6770-3 (FN)
43. Rozšíření metod založených na UV spektrofotometrii ve výuce biochemie  
**doc. MUDr. Alena Stoklasová, CSc.**  
FRVŠ 1724 (LF)
44. Inovace výuky lékařské biofyziky - základy audiometrie  
**MUDr. Libor Straka, Ph.D.**  
FRVŠ 1723 (LF)
45. Vývoj softwarových prostředků pro práci s medicínskými informacemi, pro zpracování biosignálů, pro podporu rozhodování lékaře a pro zvýšení kvality vzdělávání  
koordinátor: **prof. MUDr. Pravoslav Stránský, CSc.**  
MSM 111500004 (LF)
46. Fotopická elektroretinografie u diabetu  
**prof. MUDr. Jaromír Svěrák, DrSc.**  
IGA MZ ČR NK/6835-3 (FN)
47. Zavedení multimediální techniky do výuky lékařské fyziologie  
**MUDr. Václav Šafka, Ph.D.**  
FRVŠ 1722 (LF)
48. Vnímání rizika a míra zdravotního uvědomění u zaměstnanců různých profesí  
**doc. MUDr. Jindra Šmejkalová, CSc.**  
GA UK 90/01 (LF)
49. Sledování a porovnání osudu biologických a syntetických materiálů implantovaných do kostních defektů  
**MUDr. Pavel Šponer**  
IGA MZ ČR ND/6853-3 (LF)
50. Zavedení videoprojekce do výuky preventivního lékařství  
**doc. MUDr. Jaroslav Tejral, CSc.**  
FRVŠ 1721 (LF)

51. Standardizace vyšetřovacích metod na stabilografické plošině za účelem objektivizace změn pohybového ústrojí  
**MUDr. Vlasta Tošnerová, CSc.**  
IGA MZ ČR NK/6078-3 (LF)
52. Terapeutická ovlivnění kognitivních funkcí u schizofrenie  
**MUDr. Ivan Tůma, CSc.**  
IGA MZ ČR NF/6753-3 (LF)
53. Otiskování pomocí reverzibilních hydrokoloidů (Agar-Agar)  
**MUDr. Dagmar Vahalová**  
FRVŠ 1730 (LF)
54. Změny metabolismu lipidů a jejich mediátorových účinků u pacientů s kolorektálním karcinomem - perspektivní využití v nutriční podpoře  
**prof. MUDr. Zdeněk Zadák, CSc.**  
IGA MZ ČR NC/6171-3 (LF)
55. Vztah biochemických parametrů dárce ledviny k prognóze transplantátu  
**MUDr. Helena Živná, CSc.**  
FRVŠ 1720 (LF)
-

**SOUHRNÝ VÝZKUMNÝCH ÚKOLŮ  
ŘEŠENÝCH NA LF UK A FN V HRADCI KRÁLOVÉ  
(ABECEDNĚ)**

**Title of the research project:** Troponin in children with congenital heart diseases

**Grant Agency:** Czech Republic

**Project Number:** 305/98/P261

**Principal Researcher:** MUDr. Adamcová Michaela, Ph.D.

**Joint Researchers:** Prof. RNDr. Václav Pelouch, CSc., Doc. MUDr. Zuzana Červinková, CSc., Doc. MUDr. Jan Škovránek, CSc.

**Starting date:** 1.9.1998

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 680 000

**Summary of 2001 results**

**Title of the presentation:** Cardiac troponin T in children

**Authors:** Michaela Adamcová (1), Václav Pelouch (2)

Dept. Physiology, Charles University, Faculty of Medicine in Hradec Králové (1),

Dept. Medical Chemistry and Biochemistry, Charles University, 2<sup>nd</sup> Faculty of Medicine in Prague (2)

The aim of this study was to compare the protein profiling of the regulatory proteins in the samples of myocardium obtained during surgery of children with congenital heart diseases. Two methods (1, 2) were used for the isolation of cardiac troponin T (cTnT) from the both right ventricular and right atrial musculatures. SDS - PAGE (12.5%) was carried out; in some cases, proteins were immunoblotted and analysed using JLT-12 MAb (Sigma). It could be concluded, that (a) the first method enables to determine the intracellular compartmentation of cTnT, the second one is better for the study of cTnT isoforms expression, (b) the cytosolic pool of cTnT represents 12.5 %, the myofibrillar pool of cTnT was 87.5 %; this proportion was not affected by hypoxaemia, (c) the expression of regulatory proteins may be functionally important after a surgical repair (3).

Furthermore, we tried to evaluate the diagnostic performance of cTnT as a marker of myocardial damage during the therapy with high doses of betasympathomimetics. The plasma concentration of cTnT was measured using Elecsys Troponin T STAT Immunoassay (Roche). cTnT in neonates after the infusion of betasympathomimetics (0.24 +- 0.05 ug/l) was significantly higher ( $p < 0.05$ ) in comparison with the control group (0.05 +- 0.01 ug/l). The maximal values were reached about the 3<sup>rd</sup> day of therapy (0.39 +- 0.11 ug/l). It is possible to conclude that minor myocardial lesions caused by betasympathomimetics can be detected by the measurement of cTnT which is very important from clinical point of view.

(1) Potter J. D. et al.: Methods Enzymol. 85: 241–263, 1982

(2) Bleir J. et al.: Clin. Chem. 44 (9): 1912–1918, 1998

(3) Adamcová M., Pelouch V.: Physiol. Res. 48: 235-247, 1999

Supported by the grant of GACR No. 305/98/P261.

**Address for correspondence:** Adamcová Michaela, Dept. Physiology, Charles University, Faculty of Medicine, Šimkova 870, 500 01 Hradec Králové, Czech Republic



**Title of the research project:** Assessment of accessible methods application of local anaesthetics in dentistry

**Grant Agency:** Ministry of Education

**Project Number:** 1719/G3/01

**Principal Researcher:** Věra Bartáková

**Joint Researchers:** Alžběta Nestrojová, Jan Novák

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 106000

**Summary of 2001 results**

**Title of the presentation:** Assessment of accessible methods application of local anaesthetics in dentistry

**Authors:** Věra Bartáková, Alžběta Nestrojová, Jan Novák

Fac. Med., Charles Univ., Hradec Králové: Dept. of Dentistry

Students, the project leaders applied the local anaesthesia fellow volunteer students in the oral cavity using all methods available. First, they applied the oldest and most commonly used syringe to needle method. Then, they chose the cartridge syringe cylindrical ampoule application and they also tested a new computer guided method (Wand) with a controlled anaesthesia dosage. The last anaesthesia application was performed by the needleless injector (SyriJet). The students have chosen three types of local anaesthesia: Infiltration injection anaesthesia, block and periodontal ligament injection anaesthesia. Using the standardised psychological tests, the students evaluated both qualitative and quantitative pain perception and other unpleasant feelings during the application. At the same time, the students tried to keep the same conditions of application (identical anaesthesia, place of application, non-inflamed area, age, health conditions, one-man application). The obtained data were statistically analysed and put into graphic form. In mutual pain comparison of the methods, statistically, the needleless injector application was the best one (according to the Friedman test). The same result was obtained while comparing the qualitative perception (Bonferroni mutability test). The factual output of the project was to obtain the overall view of possible anaesthesia application as well as hands-on training and recognition of the advantages and disadvantages of the various methods. In addition to that, the University must provide students with the latest information and methods, to give them both the theoretical and practical knowledge.

Project was supported by the Ministry of Education Grant Agency, No 1719/G3/01

**Address for correspondence:** V.Bartáková, Dept.of dentistry, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic



**Title of the research project:** Practical material problems in teaching of the prosthetic technology

**Grant Agency:** Ministry of Education

**Project Number:** 1740/F3/01

**Principal Researcher:** Jiří Bittner

**Joint Researchers:** Dagmar Vahalová, Dita Dufková-Brázdová

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 170000

**Summary of 2001 results**

**Title of the presentation:** Practical material problems in teaching of the prosthetic technology

**Authors:** Jiří Bittner, Dagmar Vahalová, Dita Dufková-Brázdová

Fac. Med., Charles Univ., Hradec Králové: Dept. of Dentistry

According to the new dental curriculum at the Medical Faculty of the Charles University in Hradec Králové the fourth term of the dental syllabus of the lectures and practical classes is devoted to the prosthetic technology. During the lectures the students familiarize themselves theoretically with both materials used in the fabrication of the dental prostheses and working procedures necessary for the manufacturing of the basic kinds of dentures. During the practical classes they proceed the basic types of prosthetic materials and fabricate alone some simple restorations and dentures. So far the practical classes have taken place in the clinical prosthetic laboratory, which did not meet all demands of the big students groups. In the newly reconstructed building of the dental clinic the student teaching prosthetic laboratory will be part and parcel of the preclinical department. The equipment of this laboratory was mostly financed from the funds of this grant. We bought:

- gypsum casts cutter
- mechanical press
- gypsum vacuum mixer
- polymerization device
- polishing device
- thermostatic reservoir for dental wax.

This laboratory will be consequently completed so that it will be possible to fabricate here all basic kinds of all-resin and metallic fixed restorations, complete removable dentures and both partial removable dentures with simple wire clasps and rather complex metallic cast framework.

Project was supported by the Ministry of Education Grant Agency, No 1740/F3/01

**Address for correspondence:** J. Bittner, Dept. of dentistry, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** The role of phenotype and genotype of familial hyperlipoproteinemia in atherogenesis of coronary artery disease

**Grant Agency:** Ministry of Health

**Project Number:** NB/5205-3

**Principal Researcher:** doc.MUDr.Vladimír Bláha, CSc.

**Joint Researchers:** MUDr. Pavel Vyroubal, RNDr. Dagmar Solichová, MUDr. Radomír Hyšpler, RNDr. Martin Beránek, CSc., prof. MUDr. Zdeněk Zadák, CSc., MUDr. Dušan Černohorský

**Starting date:** 1.1.1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 2500000

#### **Summary of 2001 results**

**Title of the presentation:** Metabolism of saturated and polyunsaturated fatty acids in hyperlipidemic subjects associates with coronary atherosclerosis

**Authors:** Vladimír Bláha (1), Pavel Vyroubal (1), Dagmar Solichová (1), Radomír Hyšpler (1), Dušan Černohorský (1), Zdeněk Zadák (1), Martin Beránek (2)  
Faculty Hospital, Charles Univ., Dept.Gerontol.Metabol.Care (1), Dept. Biochem. (2)

Abnormal metabolism of fatty acids has been associated with coronary artery disease in hyperlipidemic subjects. The influence of fat quantity and saturation on atherosclerosis and thus progress of cardiovascular disease is mediated in part by effects on plasma cholesterol, low density lipoprotein-cholesterol (LDL-C) concentrations, alterations in cellular functions, changes in cellular membrane fatty acid composition, delivery of LDL cholesterol to arterial cells, and ability of HDL to remove cholesterol from arterial cells. To analyze the association of coronary atherosclerosis and fatty acid composition of plasma, erythrocyte membrane and serum lipoproteins, a group of hyperlipidemic subjects undergoing coronary angiography was studied. The role of individual fatty acids of serum, lipoprotein fractions and erythrocyte membrane in coronary artery disease (CAD) has been studied in patients who underwent an elective coronary angiography for CAD (n=75, age 33-73 years) in Group A (luminal narrowing <50%) and Group B (>50% stenosis). Severe CAD in Group B significantly correlated with higher age, serum LDL/HDL cholesterol ratio, plasma C18:3n6, IDL C18:1n7, HDL C22:6n3, and erythrocyte membrane C22:6n3 (p<0.05). IDL C18:1n7 was significantly higher in Group A (p<0.05). Plasma C18:3n6, HDL C22:6n3, and erythrocyte membrane C22:6n3 fatty acids were significantly higher in Group B (p<0.05). We conclude that an altered metabolism of gamma-linolenic (C18:3n6) and docosahexaenoic (C22:6n3) fatty acids associates with coronary atherosclerosis, indicating enhanced transport of plasma C18:3n6 and removal of HDL C22:6n3 from arterial wall cells.

Literature:

G. Hornstra, C.A. Barth, C. Galli, R.P. Mensink, M. Mutanen, R.A. Riemersma, M. Roberfroid, K. Salminen, G. Vansant and P.M. Verschuren. Functional food science and the cardiovascular system. Brit. J. Nutr., 80, S113 - S146, 1998.

**Address for correspondence:** V. Bláha, Department of Gerontology and Metabolic Care, Faculty Hospital, Charles University, Sokolská 581, 50005 Hradec Králové, Czech Republic

**Title of the research project:** Study of atherogenic mechanisms during treatment with LDL-apheresis: the role of fatty acid metabolism, cholesterol synthesis and lipoperoxidation

**Grant Agency:** Ministry of Health

**Project Number:** NB/6822-3

**Principal Researcher:** doc.MUDr.Vladimír Bláha, CSc.

**Joint Researchers:** MUDr. Pavel Vyroubal, RNDr. Dagmar Solichová, MUDr. Radomír Hyšpler, prof. MUDr. Zdeněk Zadák, CSc., prof.MUDr. Milan Bláha, CSc., RNDr. Petr Žďánský, CSc.

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 2500000

#### **Summary of 2001 results**

**Title of the presentation:** Functional importance of cholesterol biosynthesis and fatty acid metabolism in atherogenesis of hypercholesterolemic subjects treated by LDL-apheresis

**Authors:** Vladimír Bláha (1), Pavel Vyroubal (1), Dagmar Solichová (1), Radomír Hyšpler (1), Petr Žďánský (1), Zdeněk Zadák (1), Milan Bláha (2)

Faculty Hospital, Charles Univ., Dept.Gerontol.Metabol.Care (1), Dept. Haematology (2)

LDL (low-density lipoprotein) apheresis is a procedure for the selective removal of LDL cholesterol that is used in patients affected by severe familial hypercholesterolemia (FH) resistant to drug therapy. The mutual interaction between fatty acids, cholesterol synthesis and lipoperoxidation in atherogenesis and, in particular, the evidence that these mechanisms are associated with increased LDL cholesterol levels in vitro and in experimental animals, prompts us to test the hypothesis that LDL-apheresis could reduce such atherogenic lipid-related factors and therefore, positively interfere with a key mechanisms in atheroma formation. The aim of this study is to evaluate metabolism of saturated and polyunsaturated fatty acids, cholesterol biosynthetic pathway and lipoperoxidation before and after LDL-apheresis in a group of FH patients. Bioanalysis of blood and urine samples is performed using gas chromatography/mass spectrometry, reversed-phase high-performance liquid chromatography and spectrofluorometry. Preliminary results from nine patients (5 men, 4 women, age 14-56y) had shown that the favorable effect of LDL-apheresis on the atherosclerotic process depends not only on mechanical removal of LDL cholesterol but also on its influence on the other above-mentioned mechanisms of atheroma formation. The results might improve our knowledge and thus treatment of atherosclerosis, which are the leading causes of morbidity and mortality in Czech Republic.

Literature:

Bláha V, Havel E, Bláha M, Solichová D, Brátová M, Zadák Z. Atherosclerosis 1999;144(1):189.

Kempen HJM, Geversw Leuven JA, van der Voort HA, de Knijff P, Havekes L. Metabolism 1991;40:231-235.

**Address for correspondence:** V. Bláha, Department of Gerontology and Metabolic Care, Faculty Hospital, Charles University, Sokolská 581, 50005 Hradec Králové, Czech Republic



**Title of the research project:** The role of metabolic, thrombocytic and endothelial dysfunction in process of atherogenesis

**Grant Agency:** Ministry of Health

**Project Number:** NB6549-3

**Principal Researcher:** Milan Bláha

**Joint Researchers:** Zdeněk Zadák(1), Vladimír Bláha(1), Jaroslav Malý(2), Melanie Skořepová(2), Martin Blažek(2), Radek Hyšpler(1)

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 498000

**Summary of 2001 results**

**Title of the presentation:** The importance and mutual correlation between the indicators of atheromatosis activity after LDL-apheresis

**Authors:** Fac.Hosp., Hr.Kralove:Metabolic clinic(1), Fac.Hosp.,Hr.Kr.:Dept.of Clin.Haematol. (2).

The project aims to find out the importance and mutual correlation between the indicators of atheromatic activity (lipoproteins level, soluble adhesive molecules expression and the indicators of antioxidant balance) in the patients with severe familial hyperlipoproteinemia after LDL-apheresis (where the cholesterol level decreases deeply - usually to 2 mmol/l). The first part of study (beginning a year ago) aimed at developing of suitable (technically and economically acceptable) treatment regime, without dangerous side-effects. In 98 procedures (long-term treatment of 8 patients) the LDL-apheresis with Pokard absorber and automatic absorption-desorption automat (Medicap, Germany) has shown to be effective, relatively very safe (6 % of side-effects, the most often short episodes of citrate toxicity). The treatment was successful to stop the progress of atherosclerosis in 6 patients. In the aim to find out an early indicator of atherosclerotic process activity we tested the aggregation activity of platelets after the various stimulators (ADP, epinephrin, kolagen, ristocetin, propylgalat) and the early coagulation phase (apparatus: PF-100). The results after 88 examinations demonstrated that the increased thrombocyte activity drops in homozygous patients (there is the deepest drop of cholesterol level) after the procedure.

Literature: M. Bláha et al.: Trombosa a hemostáza, Eds.: Credit, Hr. Kralove 2001, p. 62 - 70. ISBN: 80-902753-4-6.

Project was supported by the Ministry of Health Grant Agency , No NB6549-3, 6822-3, 5205-3.

**Address for correspondence:** M. Bláha, Dept. of Clinical Hematology, Faculty Hospital, Sokolskastreet 480, 500 05 Hradec Kralove, Czech Republic.

**Title of the research project:** The use of low-molecular weight heparin during percutaneous coronary angioplasty (PTCA). Laboratory and clinical evaluation.

**Grant Agency:** Ministry of Health

**Project Number:** NA 6579-3

**Principal Researcher:** Miroslav Brtko

**Joint Researchers:** Ivo Varvařovský, Pavel Polanský, Miroslav pecka, Věra Dytrychová

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1 472 000

**Summary of 2001 results**

**Title of the presentation:** Low-molecular weight heparin vs. unfractionated heparin during percutaneous coronary interventions.

**Authors:** Miroslav Brtko (1), Ivo Varvařovský (2), Pavel Polanský (1)

Charles University, University Hospital, Dept. of Cardiac Surgery, Hradec Králové (1), Hospital "Podlesí", Trinec (2)

To prevent thrombembolic complications during percutaneous coronary interventions (PCI) unfractionated heparin (UFH) is used as a standard therapy. UFH is an indirect thrombin inhibitor. Heterogeneity of its molecules is the reason for great variability in its efficacy. UFH is insufficient to inhibit thrombin within the clot. UFH is inhibited by platelet factor 4 (PF-4). The effect of UFH on platelets is antagonistic – it restricts the initiation of platelet aggregation, but raises thromboxan synthesis in thrombocytes. UFH interferes with thrombocyte adhesion by von Willebrand factor inhibition.

Low-molecular weight heparin (LMWH) overcomes the above mentioned disadvantages of UFH. It has a relatively constant dose-related anticoagulation effect and is not inhibited by PF-4. It is able to inhibit the activated Xa factor even within the clot. It does not inhibit coupling of von Willebrand factor with thrombocytes.

In 2001 we evaluated the influence of UFH and LMWH on platelet functions and clinical course in 120 patients undergoing elective PCI. A significant increase of thrombocyte aggregation induced by adrenalin, ADP and arachidonic acid was seen after administration of UFH. LMWH increased only platelet aggregation induced by arachidonic acid. A significant decrease of platelet count was observed after administration of both UFH and LMWH. The application of LMWH ensured the satisfactory anticoagulation effect throughout the whole procedure. There was no statistical significant differences in an occurrence of ischemic and haemorrhagic complications between UFH and LMWH groups.

This project is supported by the Grant Agency of Ministry of Health, grant No. NA 6579-3

**Address for correspondence:** M. Brtko, Charles University, University Hospital, Dept. of Cardiac Surgery, Sokolska 481, 500 05 Hradec Kralove, Czech Republic



**Title of the research project:** Pituitary adenomas in tissue culture: The influence of somatostatin analogues and inductors of apoptosis.

**Grant Agency:** Ministry of Health

**Project Number:** NB/6172-3

**Principal Researcher:** Jan Čáp

**Joint Researchers:** Vladimír Beneš, Jaroslav Cerman, Jan Krejsek, Josef Marek, Martina Mareková, Jiří Náhlovský, Stanislav Němeček, Hana Straková, Petr Šuba

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 499000

#### **Summary of 2001 results**

**Title of the presentation:** Inhibition of growth hormone secretion by somatostatine analogues in acromegalic adenoma tissue cultures.

**Authors:** Jan Čáp (1), Martina Mareková (2), Jaroslav Cerman (2), Jiří Náhlovský (3), Petr Šuba (2), Stanislav Němeček (3), Vladimír Beneš (4), Josef Marek (5)

Charles Univ., Fac. Med. Hr. Králové: Dept. of Internal Medicine (1), Dept. of Medical Biochemistry (2), Dept. of Neurosurgery (3). 1st Fac. Med. Prague: Dept. Neurosurgery (4), 3rd Med. Dept. (5)

Somatostatin (SST) exerts its biological effects via five distinct receptor (SSTR) subtypes.

The aim of our study was to investigate the inhibition of GH secretion by somatostatin analogues preferentially binding SSTR 2 (BIM 23197, BIM 23014), and SSTR 5 (BIM 23268), with special focus on the possibility that their combination might have a potentiating effect.

Adenoma tissue has been mechanically dissociated on single-cell suspension and cultivated in multiple-well plate for 3-5 days. After the cells had adhered the medium was evacuated and replaced with serum-free medium with somatostatins in appropriate concentration. After a six hours' incubation the concentration of GH was measured by immunoassay.

As in previous study we were unable to demonstrate any difference between individual analogues and their combinations using concentrations of  $1E-7$  and  $5E-8$  mol/l, a wider concentration range ( $1E-9$  to  $1E-12$  mol/l) has been used. This approach clearly demonstrated individual differences. In one case the inhibition was minimal, in three cases it was the same with analogue BIM 23197 and BIM 23268, and in another three cases it proved to be much higher with BIM 23197 preferentially binding SSTR 2. In one of them the potentiating effect of the combination BIM 23197 + BIM 23268 could have been demonstrated.

The analogue with the preference for SSTR 5 (BIM 23268) is in some adenomas as effective as clinically used analogues with the preference for SSTR 2 and in exceptional cases their combination seems to have a potentiating effect.

The project was supported by the Czech Ministry of Health Grant Agency, No NB/6172-3 and in part by research projects of MSM 111500001.

**Address for correspondence:** J. Čáp, Second Dept. of Internal Medicine, University Hospital, 500 05 Hradec Králové, Czech Republic





**Title of the research project:** Neurovascular compression of the rostral ventrolateral medulla in patients with essential hypertension compared to normotensive subjects. Prospective MR study.

**Grant Agency:** Ministry of Health

**Project Number:** NA/6169-3

**Principal Researcher:** Jiří Ceral

**Joint Researchers:** Jan Žižka, Jiří Kvasnička, Pavel Eliáš

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1129000

**Summary of 2001 results**

**Title of the presentation:** Neurovascular compression of the rostral ventrolateral medulla in hypertensive patients compared to normotensive subjects - preliminary results.

**Authors:** Jiří Ceral (1), Jan Žižka (2), Jiří Kvasnička (1), Pavel Eliáš (2)

Fac. Med. Charles Univ., Hr. Králové: Dept. of Internal Medicine (1), Dept. of Radiology (2)

Compression of the left rostral ventrolateral medulla oblongata (RVLM) by an abnormally located artery may be one of the possible causes of essential hypertension, as some experimental studies, post-mortems, and neurosurgical observations suggest. At present the only imaging method capable of detailed evaluation of the relations between posterior fossa vessels and brain stem structures is magnetic resonance imaging (MR).

**Design and Methods** We prospectively examined 32 hypertensive patients and 40 BMI and age matched normotensive subjects by MR. Patients with severe arterial hypertension in whom renal, renovascular and endocrine hypertension was ruled out were included. MR imaging protocol consisted of transverse and coronal T2 TSE, transverse 3D TOF MRA and 3D CISS imaging sequences positioned over the brain stem. MR images were assessed in a blind fashion.

**Results:** In the essential hypertension group, 24 (75%) of 32 cases showed neurovascular compression of the medulla oblongata at any level, 10 (31%) of 32 patients demonstrated neurovascular compression at the RVLM, out of which (19% of total) were at the left RVLM. In the control group of normotensive subjects (N = 40), 32 cases (80%) showed compression of the medulla oblongata, 20 cases (50%) showed neurovascular compression at the RVLM, out of which 13 subjects (32% of total) showed neurovascular compression at the left RVLM.

**Conclusions:** Neurovascular compression of medulla oblongata is a very frequent finding in both hypertensive patients and normotensive subjects. In hypertensive patients, higher prevalence of neurovascular compressions at the left RVLM was not confirmed. Our results do not support the hypothesis of neurovascular compression at the left RVLM as an etiological factor of essential hypertension.

**Address for correspondence:** J. Ceral, Dept. of Internal Medicine, Charles University Faculty of Medicine

**Title of the research project:** Installation of personal computers in practical classes in medical biochemistry

**Grant Agency:** Ministry of Education

**Project Number:** 1739/2001/F3

**Principal Researcher:** Jaroslav Cerman

**Joint Researchers:** Petr Šuba, Pavel Šiman

**Starting date:** 1.1. 2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 119

**Summary of 2001 results**

**Title of the presentation:** Installation of personal computers in practical classes in medical biochemistry

**Authors:** Jaroslav Cerman (1), Petr Šuba (1,2), Pavel Šiman (1)

Faculty of Medicine, Charles University, Hradec Králové: Dept. of Medical Biochemistry (1), Dept. of Neurosurgery (2)

With respect to the lack of computerization of biochemical practicals up to now we have established a new instrumental laboratory equipped with three personal computers (PC) with appropriate hardware. Besides, some spectrophotometers have been attached to communicate with the PCs via the RS 232 port.

Using Visual Basic 6.0 we have created "user-friendly" program applications based on Excel spreadsheet for the processing of experimental data:

- 1) Graphic presentation of various modes of spectral measurement.
- 2) Fitting standard curves and various mathematical functions with experimental points.
- 3) Statistical evaluation of analytical parameters of the methods used including calculation of uncertainty of measurement and confidence interval of results.
- 4) Evaluation of reaction kinetics especially in enzymology; determination of velocity of enzyme-catalyzed reactions and  $K_m$ ; linear transformation of the Michaelis-Menten plot.
- 5) Collection and processing of the data obtained from measuring instruments which on-line communicate with the PCs and evaluation of the individual students data at seminars.
- 6) Computer-aided training in biochemistry using commercial educational programs on CDs.

The project was supported by the Ministry of Education, Project No. FRVS/1739/F3

**Address for correspondence:** J. Cerman, Dept. Med. Bioch., Charles Univ. in Prague, Faculty of Med. in Hradec Králové, 500 01 Hradec Králové, Czech Rep. (Mail:cerman@lfhk.cuni.cz)

**Title of the research project:** Proteome centre for the study of intracellular parasitism

**Grant Agency:** Ministry of Defence

**Project Number:** LN00AO3

**Principal Researcher:** MUDr. Jiří Stulík, CSc.

**Joint Researchers:** M. Červinka, J. Krejsek, E. Rudolf, J. Peychl, Z. Fiedler, M. Černá, J. Havlasová, K. Jankovičová, M. Toušková, V. Pelantová

**Starting date:** 2000

**Duration (years):** 5

**Funds allocated for project - total in Czech crowns:** 2570000

**Summary of 2001 results**

**Title of the presentation:** Proteome centre for the study of intracellular parasitism

**Authors:** M. Červinka (1), J. Krejsek (2), E. Rudolf (1), J. Peychl (1), Z. Fiedler (1), M. Černá (2), J. Havlasová (2), K. Jankovičová (2), M. Toušková (2) - Faculty of Medicine, Charles University, Hr. Králové, Depts: Medical Biology and Genetics (1), Clinical Immunology (2)

The main goal of this project is study of intracellular parasitism in model infection with bacteria *Francisella tularensis*. In the first step cultivation conditions were optimised for three model cell lines: B2, B10 and J774 and protocol for experimental infection were developed. In 2002 new technology for proteomic analysis and mass spectrophotometry was introduced in our laboratory. With help of these technologies, analysis of microbial markers of *F. tularensis* was performed and proteomic map was constructed. Together it was identified 125 new bacterial proteins and data was transferred to the international proteomic database. The protein map of *F. tularensis* with 176 identified proteins is part of a new 2-DE database "PMMA-2DPAGE", which is available on internet address [www.pmma.pmfhk.cz](http://www.pmma.pmfhk.cz). Comparative genomic analysis of protein spectra enables classification of proteins typical for particular stages of infection. In another part of the project immunoreactive components of the *F. tularensis* were studied and proteomic analysis of the phagosome was performed utilising DAGE method. The subcellular fractionalisation of the phagosomes from infected cells was done in two lines of mouse macrophages (congenic in *Bcg* locus, different in allele *Nramp*). Study of gene expression in host cells after interaction with pathogen and analysis of intercellular signals related to this interaction began. Monitoring of infection process was performed with the help of genetically modified strain of *F. tularensis* with new gene for green fluorescence protein. By confocal laser scanning microscopy the co-localisation of specific markers of *F. tularensis* and specific markers of macrophages phagosomes. Phenotypisation of selected surface molecules and basic characterisation of expression of cytokine genes was done.

**Address for correspondence:** M. Červinka, Dept. Med. Biol., Charles University in Prague, Faculty of Medicine of Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Rep.

**Title of the research project:** Serious organ failures, experimental and clinical aspects, possibilities for prevention and therapeutic management

**Grant Agency:** Ministry of Education

**Project Number:** MSM111500001

**Principal Researcher:** Miroslav Červinka

**Joint Researchers:** Jaroslav Cerman, Ivo Dřížhal, Vladimír Geršl, Jiří Horáček, Miroslav Kuba, Yvona Mazurová, Naďa Jirásková, Zbyněk Vobořil, Pavel Živný

**Starting date:** 10.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 3163000

#### **Summary of 2001 results**

**Title of the presentation:** Experimental and clinical models for serious organ failures

**Authors:** M. Červinka (1), M. Adamcová (2), J. Cerman (3), I. Dřížhal (4), V. Geršl (5), J. Horáček (6), M. Kuba (7), Y. Mazurová (8), N. Jirásková (9), Z. Kaška (10), P. Živný (11) - Fac. Med., Charles Univ., Hr. Králové, Depts: Med. Biol. (1), Physil. (2), Med. Biochem. (3), Stomat. (4), Pharmacol. (5), Microbiol. (6), Path. Physiol. (7), Histology (8), Ophtalmol. (9), Surgery (10), Clin. Biochem. (11)

Successful therapeutic management of serious organ failures requires co-operation of several theoretical and clinical departments. Following topics were studied during 2001:

- a) Effects of pyridoxal isonicotinoyl hydrazone (Fe-chelating agent, potentially active in pathological states resulting from both the iron-overload and free radicals formation) on troponin T was measured in rabbits.
- b) Induction of apoptosis in several in vitro and in vivo models (pituitary adenoma cells, leukemic cell line, epithelial cells) was measured by several immunocytochemical apoptotic markers.
- c) Comparison of periodontal reparation by subgingival curettage and by Vector treatment was done in 30 patients.
- d) Development of new electrophysiological methods enables early diagnostics of functional disorders of CNS.
- e) Reparation of (ibotenic acid-) lesioned striatum by transplantation of rat neostriatum was reported (as a model of neurodegenerative process), grafts survive for 9 months.
- f) Incidence of secondary cataract after implantation of several types of intraocular lens was analysed.
- g) Bacterial complications after organ (renal) and cell (bone marrow) transplantations were monitored.
- h) Concentration of leptin in patients with polytraumata and colorectal carcinoma was measured.
- i) Cytotoxicity and biocompatibility assessment of materials (artificial blood vessels) used in organ failures treatment was performed.
- j) Glucose, urea, lactate and amino acid concentration in skeletal muscle interstitium in septic patients were analysed in a microdialysis study. In experiments with hepatoctemised rats amino acids were compared in muscle and liver interstitium.

Project was supported by the Ministry of Education Research Project, No MSM 111500001.

**Address for correspondence:** M. Červinka, Dept. Med. Biol., Charles University in Prague, Faculty of Medicine of Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Rep.



**Title of the research project:** Testing of intestinal permeability in models of bowel and liver injury

**Grant Agency:** Charles University

**Project Number:** 1/1999/C

**Principal Researcher:** Zuzana Červinková

**Joint Researchers:** Dagmar Radvaková, Halka Lotková, Pavel Kohout

**Starting date:** 1.1.1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 200 000

**Summary of 2001 results**

**Title of the presentation:** Experimental biliary cirrhosis in rat - impact on small intestine

**Authors:** Zuzana Červinková (1), Dagmar Radvaková (1), Halka Lotková (1), Pavel Kohout (2)

Fac. Med. Charles Univ., Hr. Králové: Dept. Physiology (1), Dept. Geront. Metab. (2)

The aim of our experiments was: a) to introduce a model of biliary cirrhosis in rat by ligation of bile duct; b) to study impact of bile duct ligation on biochemical markers of liver injury and liver DNA synthesis; c) to evaluate impact of bile duct ligation on the functional and morphological parameters of small intestine. The experiments were performed on 40 male albino Wistar rats with an initial body mass of 210-225 g. In the first group secondary biliary cirrhosis (BC) was induced by ligation of bile duct, the second control group (C) underwent median laparotomy. The rats were sacrificed by exsanguination from abdominal aorta three weeks after the operations. The extent of liver damage and liver regeneration was determined by assessment of serum activities of AST, ALT, GMP and AP, serum concentrations of albumin and CRP, liver DNA synthesis (measured by incorporation of <sup>3</sup>H thymidine), and mitotic activity of hepatocytes. Intestine permeability was assessed by lactulose-mannitol test, morphological changes were evaluated using histological estimation, gut reparative process was determined by intestine DNA synthesis. Significant increase ( $p < 0.05$ ) of all recorded biochemical parameters of liver injury together with liver morphological changes clearly documented development of BC in rats with bile duct ligation. Lactulose-mannitol test and intestine DNA synthesis were significantly increased ( $p < 0.05$ ) in BC rats to compare with control rats. Secondary biliary cirrhosis induced injury of small intestine shown by histological changes (confluence and irregularity of villi) and functional changes (impairment of intestinal barrier). These changes are probably to some extent related to the presence of portal hypertension. Intestine injury was followed by induction of reparative process judging by increased DNA synthesis in the small intestine.

**Address for correspondence:** Z. Červinková, Dept. of Physiology, Charles Univ. in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Hepatology - physiological, pathophysiological and clinical aspects

**Grant Agency:** Ministry of Education

**Project Number:** MSM 11150003

**Principal Researcher:** MUDr. Zuzana Červinková

**Joint Researchers:** Petr Hůlek, Helena Živná, Jiří Kanta

**Starting date:** 1.1.1999

**Duration (years):** 5

**Funds allocated for project - total in Czech crowns:** 2 745 000

**Summary of 2001 results**

**Title of the presentation:** Acute and chronic liver injury in in vivo and in vitro animal experiments and clinical practice

**Authors:** Zuzana Červinková (1), Petr Hůlek (2), Helena Živná (1), Jiří Kanta (3)  
Fac. Med. Charles Univ., Hr. Králové: Dept. Physiology (1), 1st Dept. Internal Med. (2),  
Dept. Med. Biochem. (3)

The research project is divided into several mutually interconnected branches. Twenty-two researchers from seven departments of our faculty participated on the project. Following main topics were studied during the last year:

- a) Activation of mitochondrial glycerophosphate cytochrome c reductase by triiodothyronine in rat liver regenerating after partial hepatectomy (70 %).
- b) Hepatotoxic effect of galactosamine in vivo and protective role of gastric administration of lipid emulsion enriched by medium chain fatty acids.
- c) Effect of s-adenosylmethionine (protective role against glutathione depletion) on hepatocyte primary culture exposed to t-butylhydroperoxide (non-specific peroxidating agent).
- d) Differences in selected biochemical markers and histological findings after bile duct ligation in male and female rats.
- e) Role of leptin in initiation of liver regeneration in male and female rats of various strains.
- f) In situ hybridisation in effort to study fibrillin-2 (component of elastic fiber) which plays an important role in elastin storage.
- g) Impact of TIPS on insulin resistance in patients with and without diabetes mellitus.
- h) Markers of autoimmune insulinitis in patients with autoimmune liver disease (primary biliary cirrhosis, autoimmune hepatitis).
- i) Incidence of hemochromatosis among patients with severe hepatopathy by estimation of iron metabolism and incidence of gene mutations associated with hemochromatosis.

**Address for correspondence:** Z. Červinková, Dept. of Physiology, Charles Univ. in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic



**Title of the research project:** Chronic gastritis induced by Helicobacter pylori infection and/or by autoimmune mechanisms - a source of dyspeptic complaints?

**Grant Agency:** Ministry of Health

**Project Number:** NK/6174-2

**Principal Researcher:** Bohumil Fixa

**Joint Researchers:** Olga Komárková, Zdeněk Nožička, Jan Nožička, Irena Šulcová, Jaroslav Malý

**Starting date:** 1.1.2000

**Duration (years):** 2

**Funds allocated for project - total in Czech crowns:** 650000

**Summary of 2001 results**

**Title of the presentation:** Long-term follow up of patients with functional dyspepsia. Dependence of dyspeptic complaints on Helicobacter pylori infection?

**Authors:** Bohumil Fixa (1), Olga Komárková (1), Zdeněk Nožička (2)

Fac.Med.Charles Univ.,Hradec Králové: 2nd Dept. of Medicine (1), Dept. of Pathology (2)

The importance of H.pylori infection in etiology of functional dyspepsia (FD) remains open. The problem has been studied mainly in association with the prevalence of H.pylori in FD and with the effect of H.pylori eradication in FD on dyspeptic complaints. The results were controversial. The short period of the follow up of published studies has been criticized. The goal of our study was to compare the prevalence of main dyspeptic complaints and the quality of life in FD-patients with and without H.pylori infection during the long-term follow up. 1742 patients with the diagnosis of FD were examined for H.pylori and were asked by questionnaire for dyspeptic complaints (epigastric pain and fullness, nausea, vomiting) and quality of life. 563 patients answered the questions, but only answers of 253 patients were reliable. H.pylori was found in 86 patients (27 m, 59 w, mean age 43.1), in 167 patients (53 m, 114 w, mean age 40.5) the examination was negative. The mean follow up of period in H.pylori+ group was 9.6 years, in the H.pylori- group 6.6 years.

Dyspeptic complaints and quality of life during the first examination, one year later and in the year of the questionnaire were evaluated. No significant differences have been found in the prevalence of any complaints and of the quality of life during the entire follow up. Conclusions: long-term follow up of dyspeptic complaints and quality of life in FD-patients did not show any dependence on H.pylori infection. H.pylori should not be taken as a factor in the etiology of FD-symptoms.

**Address for correspondence:**

**Title of the research project:** New Iron Chelators - Problems of Their Cardiovascular, Potential Cardioprotective and Biotransformation Effects.

**Grant Agency:** Czech Republic

**Project Number:** 305/00/0365

**Principal Researcher:** Vladimír Geršl

**Joint Researchers:** Přemysl Poňka, Eva Kvasničková, Radomír Hrdina, Yvona Mazurová, Michaela Adamcová, Jana Kaplanová, Jarmila Macháčková, Ivona Klimtová, Tomáš Šimůnek

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 4495000

#### **Summary of 2001 results**

**Title of the presentation:** Evaluation of the model of anthracycline-induced cardiotoxicity in rabbits in vivo.

**Authors:** I. Klimtová (1), T. Šimůnek (1), J. Kaplanová (6), V. Geršl (3), M. Adamcová (4), R. Hrdina (1), J. Macháčková (3), Y. Mazurová (5), L. Schrötterová (2), E. Kvasničková (2)

Charles Univ.: Fac. Pharm., Hr. Králové: Dept. of Pharmacol. (1), Dept. of Biochem. (2); Fac. Med., Hr. Králové: Dept. of Pharmacol. (3), Dept. of Physiol. (4), Dept. of Histol. Embryol. (5), Dept. of Pediatrics (6)

The aim of the study was to evaluate a model for testing of potential cardioprotective agents against anthracycline toxicity in rabbits in vivo. For this purpose, selected cardiovascular (incl. echocardiographic), biochemical and hematological parameters were observed during repeated, 10-weeks lasting (once weekly) administration of daunorubicin (3 mg/kg i.v.) and combination of daunorubicin with known cardioprotective iron-chelating agent dexrazoxane (60 mg/kg i.p., 30 min. before daunorubicin, 3 mg/kg i.v.). The control group received saline (1ml/kg i.v.). The repeated administration of daunorubicin induced cardiomyopathy with progressive impairment of cardiac function: at the end of experiment, left ventricular ejection fraction was reduced to 73 % and PEP/LVET ratio increased up to 134 % of the initial values; LV dp/dtmax was reduced to 58 % and blood pressure to 76 % comparing with the control group. All these changes were statistically significant. Combination with dexrazoxane did not cause consistent and significant changes of any of these cardiovascular parameters. The observed significant decrease of proteins and albumins and increase of triglycerides and cholesterol could be caused by the nephrotoxic effect of daunorubicin. The combination with dexrazoxane prevented these changes and mostly also an increase in cTnT. It also improved survival of animals (daunorubicin - 73 %, combination with dexrazoxane - 100 %). Daunorubicin caused significant decrease in erythrocyte count, hemoglobine and hematocrite. These only changes, typical for aplastic anemia, were not affected by dexrazoxane. These results confirm suitability of the model for testing of other potential cardioprotective agents. Supported by the Grant GA CR No 305/00/0365.

**Address for correspondence:** V. Geršl, Dept. of Pharmacology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Rep.



**Title of the research project:** Pharmacokinetic of low dose methotrexate administered to patients suffering from psoriasis in early period of disease

**Grant Agency:** GAUK

**Project Number:** 9/1999

**Principal Researcher:** Jiří Grim, MD

**Joint Researchers:** Prof. Jiřina Martínková, MD, Ph.D., Jaroslav Chládek, Ph.D., Marie Šimková, MD, Jaroslava Vaněčková, MD, Věra Koudelková, MD, Assoc. Prof. Marie Nožičková, MD, Ph.D.

**Starting date:** 1.3.1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 250.000,-

**Summary of 2001 results**

**Title of the presentation:** Pharmacokinetics (PK) and pharmacodynamics (PD) of low-dose methotrexate (LDMTX) in the treatment of psoriasis

**Authors:** Jiří Grim, MD

The aim of this prospective study was to investigate and compare the PK and PD of oral LDMTX as a bolus dose or in divided schedule. The drug was administered to patients with resistant forms of psoriasis. 24 men and 17 women (mean age  $50.2 \pm 11.5$  yr) were divided into two groups. The first was treated with LDMTX of 7.5 mg (N=6) or 15 mg (N=11) a week in a single bolus dose (Study A). The second group was taken either 2.5 mg (N=12) or 5 mg (N=12) MTX given in 12-h intervals 3-times a week (Study B). Blood was sampled at 0, 0.5, 1, 1.5, 2, 3, 4, 6, 10, 14 and 24 h (Study A) and at 0, 1, 2, 4, 8, 12, 14, 24, 25, 26, 28, 32 and 36h h (Study B) after the initiation of the drug dosage. The PK analysis was provided in a week 1 and week 13 in each patient. The plasma concentrations were determined by HPLC. AUCMTX was calculated using trapezoidal rule (i.e AUC<sub>0-24h</sub>, Study A) or by MW-pharm programme (AUC<sub>0-36h</sub>, Study B). PD were assessed continuously at weeks 1, 5, 9 and 13 using the Psoriasis Area and Severity Index Score system (PASI score). PK/PD analysis revealed a significant inverse relationship between PASI score and AUCMTX ( $\rho = -0.65$ ,  $p < 0.0001$ ). 20 subjects achieved higher than 50 % drop in PASI score in a week 13 and were considered responders. 17 out of 20 responders had AUCMTX higher than 2500 nmol.h/L compared with only 1 out of 21 non-responders ( $p < 0.001$ , Fisher's exact test). Nevertheless, patients achieving AUCMTX more than 3300 nmol.h/L had a significantly shorter time to reach ALT and AST activity higher than the upper limit of the physiologic range (ANOVA;  $p < 0.001$ ). Moreover, patients with a maximal drug plasma concentration higher than 500 nmol/L had a significantly higher incidence of adverse effects like nausea, headache and fatigue (F-test,  $p < 0.01$ ).

**Address for correspondence:** Department of Pharmacology, Charles University, Faculty of Medicine, Šimkova 870, Hradec Králové, 500 01, grimj@lfhk.cuni.cz

**Title of the research project:** Effect of acidosis on protein and amino acid metabolism

**Grant Agency:** Czech Republic

**Project Number:** 305/01/0578

**Principal Researcher:** Doc. MUDr. Milan Holeček, DrSc.

**Joint Researchers:** Prof. MUDr. Vladimír Teplan, DrSc., Ing. Luděk Šprongl, MUDr. Roman Šafránek, Mgr. Jana Kadlčíková, Doc. MUDr. Ivan Tilšer, CSc.

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 677000/rok 2001

#### **Summary of 2001 results**

**Title of the presentation:** Effect of acidosis on protein and amino acid metabolism.

**Authors:** M. Holeček, V. Teplan, R. Šafránek, R. Ryšavá, S. Voslařová, J. Kadlčíková, L. Šprongl, I. Tilšer

The aim of the project is to analyze the effect of acidosis on protein and amino acid metabolism. The main aim of the present studies is to estimate the effect of acidosis on metabolism of branched-chain amino acids (BCAA) in liver and muscle of white rat and the effect of administration of ketoanalogues of amino acids on protein metabolism in patients with chronic renal insufficiency (CRI).

The preliminary results of in vitro studies demonstrate decreased rate of leucine oxidation in m. soleus of Wistar rat incubated in medium of pH 7.2 against control (pH 7.4). We did not find the effect of decreased pH on protein synthesis. The changes in proteolysis are analyzed at present time.

The effect of acidosis of hepatic leucine metabolism was evaluated in isolated perfused liver (IPL) of Wistar rat using the single pass technique with L-[1-<sup>14</sup>C]leucine and a-keto[1-<sup>14</sup>C]isocaproate (KIC) as a tracer. Perfusate solution was bicarbonate buffer pH 7.2 or 7.4 (control) containing glucose (10 mM) and amino acids. The results demonstrated significantly higher rate of KIC oxidation in hepatic tissue perfused with medium of pH 7.2 against control group ( $90.0 \pm 5.3$  vs.  $65.1 \pm 5.7$ ;  $p < 0.05$ ).

The results of a clinical study evaluating the effect of acidosis on BCAA and protein metabolism in CRI patients demonstrated beneficial effect of administration of ketoanalogues of essential amino acids on protein balance (increased albumin concentration in blood, decreased loss of proteins by urine). In CRI patients treated by ketoanalogues of amino acids we observed also increased concentrations of BCAA and decreased concentrations of cholesterol and triglycerides in blood.

The study was supported by a grant No. 305/01/0578 of the Grant Agency of the Czech Republic.

**Address for correspondence:** Milan Holeček, Department of Physiology, Charles University, School of Medicine, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Effect of amino acids and hormones on protein metabolism in catabolic illness

**Grant Agency:** Ministry of Health

**Project Number:** NB/6793-3

**Principal Researcher:** Doc. MUDr. Milan Holeček, DrSc.

**Joint Researchers:** Ing. Luděk Šprongl, MUDr. Roman Šafránek

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 406000/rok 2001

#### **Summary of 2001 results**

**Title of the presentation:** Effect of glutamine on BCAA metabolism in hepatic tissue

**Authors:** M. Holeček, R. Šafránek, R. Ryšavá, S. Voslařová

The aim of the project is to study the pathogenesis of muscle wasting in severe illness and the effect of humoral factors on protein and amino acid metabolism in the whole-body and in specific tissues. In our previous studies (1, 2) we demonstrated activated resynthesis of branched-chain amino acids (BCAA) in hepatic tissue of endotoxemic and TNF treated rats. The aim of the present study was to estimate if the observed changes in the hepatic BCAA metabolism can be induced by increased availability of glutamine.

Parameters of hepatic leucine metabolism were evaluated in isolated perfused liver (IPL) of Wistar rats using the single pass technique with L-[1-14C]leucine and keto[1-14C]isocaproate (KIC) as a tracer. Perfusate solution was bicarbonate buffer (pH 7.4) containing glucose (10 mM) and amino acids. Glutamine concentration was 1 mM in glutamine group (n=9) and 0 mM in controls (n=8). Statistical analysis was performed using Mann-Whitney test.

The addition of glutamine to perfusion solution caused a significant increase in leucine oxidation ( $13.67 \pm 2.38$  vs.  $6.66 \pm 1.04$ , mmol/g dry liver/h,  $P < 0.05$ ) and a decrease in KIC oxidation ( $92.0 \pm 12.9$  vs.  $163.7 \pm 16.5$  mml/g dry liver/h,  $P < 0.05$ ). These results demonstrate a marked increase in hepatic BCAA aminotransferase activity and a decrease in hepatic branched-chain keto acid dehydrogenase activity. The results indicate decreased BCAA oxidation and increased conversion of branched-chain keto acids to BCAA.

We conclude that increased delivery of glutamine to hepatic tissue enhances resynthesis of essential BCAA from their ketoanalogues. This metabolic alteration enables the preservation of BCAA for the body's requirements.

1. Holeček et al. Am. J. Physiol. 273: E1052-1058, 1997.

2. Holeček et al. Metabolism 47: 681-685, 1998.

The study was supported by a grant No. NB 6793-3 of IGA MH of the Czech Rep

**Address for correspondence:** Milan Holeček, Department of Physiology, Charles University, School of Medicine, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Multimedial computer treatment and presence of forensic-medicine expertises

**Grant Agency:** Ministry of Education

**Project Number:** 1737/F3

**Principal Researcher:** Petr Hottmar

**Joint Researchers:** Radovan Havel

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 373000

**Summary of 2001 results**

**Title of the presentation:** Multimedial computer treatment and presence of forensic-medicine expertises

**Authors:** Petr Hottmar, Radovan Havel

Fec.Med.,Charles Univ., Hr. Králové: Dept. of Forensic Medicine

At the department of Forensic Medicine(School of Medicine in Hradec Kralove, Charles University in Prague) the educational collection of 450 digital photographs was produced. In the project was used the documentation from dissections resolved during the year 2001. The photographs were taken directly during the dissections and were processed by the computer programs: Paint Shop Pro, Adobe Photo shop, Photo Imapct: than gradually filed in accordance with the type of apposite case to the database, which was adjusted to the final form along with graphical editing of background image, the didactic highlighting of our findings and the final detailed graphical layout of the program.

The database served for the creation of an interactive computer which covers differential diagnostic overview, a comprehensive overview about the forensic medicine problematic and also enables an individual approach to the single cases, all in the necessary multi factorial perspective determined by particularity of the discipline ( forensic medicine).The individual pictures from the database serve also for the compilation of ad hoc sets consecutively used in practical classes or lectures.

The pogram was also copied on the CD ROOM, which is a very suitable tool in all forms of teaching and studying, serves as an atlas for self study purposes.

Professionally paced program, using modern audiovisual technique is an irreplaceable tool especially in the discipline as forensicc medicine, where the digital documentation partly replaces otherwise difficult practicable demonstration of some cases.

**Address for correspondence:** Petr Hottmar, Dept.of Forensic Medicine, Fac. Med.,Charles Univ., Hradec Králové, Czech Republic

**Title of the research project:** The Influence of Covering of Stents on the Occurrence of Stenoses in Patients Treated with Transjugular Intrahepatic Portosystemic Shunt - TIPS  
Part II Prospective Randomized Control Study

**Grant Agency:** Ministry of Health

**Project Number:** NA 6767-3

**Principal Researcher:** Petr Hůlek

**Joint Researchers:** Antonín Krajina, Pavel Eliáš, Tomáš Fejfar, Miroslav Lojík, Pavel Ryška

**Starting date:** 14.1.2002

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 982000

**Summary of 2001 results**

**Title of the presentation:** The Influence of Covering of Stents on the Occurrence of Stenoses in Patients Treated with Transjugular Intrahepatic Portosystemic Shunt - TIPS - Part II  
Prospective Randomized Control Study

**Authors:** Petr Hůlek (1), Antonín Krajina (2), Pavel Eliáš (2), Tomáš Fejfar (3), Miroslav Lojík (2), Pavel Ryška (2)

Fac. Dep. of Internal Med., Univ. Hospit. Hradec Králov (1), Dept. of Radiodiagnostics ,  
Medical Faculty Hr. Kr. (2), Dept. of Internal Med., Med. Fac., Hradec Králové (3)

**Introduction:**

In our previous Grant, which we were conducting from 1996 to 1999, we have proved that coating of the stents in the parenchymal part (supporting the channel in the TIPS) by polytetrafluorethylen (ePTFE) reduces occurrence of stenoses inside the stent.

**Aim of the study:**

The aim of this proposal is to prove in similar, prospective randomized controlled study, that use of longer all-over ePTFE coated stents will lead to a decrease of both types of stenosis.

**Results:**

During the year 2001 seven patients were treated by TIPS using ePTFE covered stents. Another ten patients were treated with non covered stents in control group. Because of short time of follow-up, we do not have enough results for analysis. In the next year we will continue in our work.

**Summary:**

7 patients in study group and 10 patients in control group were enrolled in to the above mentioned study during the year 2001.

**Address for correspondence:** Doc. MUDr. P. Hůlek, CSc.; Dept. of Internal Med., Univ. Hosp. Hradec Králové, e-mail: hulek@fnhk.cz



**Title of the research project:**

Breath isoprene determination - test interpretation and its application into clinical research of cholesterol metabolism disorders

**Grant Agency:** Czech Republic**Project Number:** 203/01/P110**Principal Researcher:** MUDr. Radomír Hyšpler, PhD., Medical Faculty, Šimkova 870, Hradec Králové, 500 02**Joint Researchers:****Starting date:** 1.1.2001**Duration (years):** 3**Funds allocated for project - total in Czech crowns:** 630000**Summary of 2001 results****Title of the presentation:**

Breath isoprene as a measure of the depression in cholesterol synthesis in intensive care patients

**Authors:** Hyšpler, R., Gasparič, J., Zadák, Z.

Analysis of breath isoprene brings an important information about cholesterol synthesis rate due to its unique properties.

The whole expired breath of ten ICU patients receiving total parenteral nutrition and ten healthy controls was collected and analyses were performed by Solid Phase MicroExtraction followed by GC/MS. Breath sampling was performed at 3 am and 2 pm.

The night levels were 2.33 (SD 0.87) nmol/l vs. 11.23 (SD 1.28) nmol/l in healthy controls. The day levels were 2.29 (SD 0.67) nmol/l vs. 3.38 (SD 0.88) nmol/l in healthy controls.

During the following year the possible use of MicroFID in breath isoprene analysis will be evaluated. The aim is maximum simplification and automation of expired air sampling and analysis. Also, the isoprene formation mechanism will be examined in vitro.

The proposed investigation represents a practical application of results obtained within the framework of a GAČR grant n. 203/99/1165.

**Publications:**

Hyšpler, R., Crhová, Š., Zadák, Z., Gasparič, J.: Breath isoprene as a measure of the depression in cholesterol synthesis in intensive care patients, *Atherosclerosis* 2(2), 102, 2001.

Hyšpler, R., Tichá, A., Indrová, M., Zadák, Z., Hyšplerová, L., Gasparič, J., Churáček, J.: A simple, optimized method for the determination of sulphide in whole blood by GC-MS as a marker of bowel fermentation processes, *Journal of Chromatography B*, accepted for publication, in press.

**Address for correspondence:** MUDr. Radomír Hyšpler, PhD, Klinika gerontologická a metabolická, Fakultní nemocnice, 500 05 Hradec Králové, rhyšpler@lfhk.cuni.cz

**Title of the research project:** The histopathology of middle ear of newborns and infants

**Grant Agency:** Ministry of Health

**Project Number:** 6189-3

**Principal Researcher:** Viktor Chrobok

**Joint Researchers:** Eva Šimáková, Bruno Ježek, Arnošt Pellant, Anita Pollak, Věra Jüttnerová

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 500000

**Summary of 2001 results**

**Title of the presentation:** Residual mesenchyme in the middle ear cavity of newborns with malformation of the kidney

**Authors:** Viktor Chrobok (1), Eva Šimáková E.(2), Jianning N. Liang (3)

(1) Department of ORL General Hospital Pardubice, (2) Department of Pathology, University Hospital, Hradec Králové, (3) UCL Medical School, London, UK

The role of mesenchymal tissue in the development of the middle ear is controversial. It has been shown that in the human middle ear the resorption of mesenchymal tissue begins normally during the 12<sup>th</sup> gestational week and is completed between the 32<sup>nd</sup> gestational week and the 13<sup>th</sup> month postpartum. Diminished quantity of amniotic fluid surrounding the foetus (oligohydramnions) is associated with an increased amount of mesenchyme in the middle ear cavity. Oligohydramnions characteristically occurs in combination with other findings: renal and urinary tract malformations, facial malformations and hypoplastic lungs. Such findings are known as Potter's sequence.

Microscopic sections of 37 temporal bones from 22 fetuses were examined, five with renal agenesis, six with Potter's sequence without renal agenesis and two with mild kidney pathology. Every tenth section containing the stapes were used for measuring the volume of mesenchymal tissue in the middle ear cavity. Image analysis by PC computer (LUCIA -M) was used. At 5% significance level, fetuses with serious renal pathology had more mesenchymal tissue in the middle ear cavity than a control group of nine fetuses with no renal or urinary tract abnormality. Pneumatization (luminization) of the middle ear cavity starts from eustachian tube and continues along the tympanic membrane to the lateral part of mesotympanum. The mesenchyme remains longer in the medial part of mesotympanum around the stapes.

**Conclusion**

The fetuses with renal pathology had no typical malformations of the hearing organ. However, there was more volume of mesenchymal tissue in the middle ear cavity in cases with serious pathology of kidney than in the control group.

Project was supported by the IGA Ministry of Health, No. 6189-3

**Address for correspondence:** Viktor Chrobok, Department of Otolaryngology, General Hospital, Kyjevská 44, 532 03 Pardubice, Czech Republic, e-mail: chrobok@nem.pce.cz



**Title of the research project:** The assessment of dipeptidyl peptidase IV in thyroid differential diagnosis

**Grant Agency:** Charles University

**Project Number:** 87/2000

**Principal Researcher:** Ivana Kholová

**Joint Researchers:** Aleš Ryška, Marie Ludvíková, Jan Čáp, Ivo Šteiner, Lucie Barvířová

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 137000

**Summary of 2001 results**

**Title of the presentation:** Dipeptidyl peptidase IV and thyroid peroxidase in thyroid neoplasia

**Authors:** Ivana Kholová, Aleš Ryška, Marie Ludvíková, Jan Čáp

The aim of the study was to evaluate expression of dipeptidyl peptidase IV [DPP IV] and thyroid peroxidase [TPO] in thyroid tumors. DPP IV is a membrane-bound exopeptidase, which is not present in normal follicular cells. TPO is a crucial enzyme in the biosynthesis of the thyroid hormones and thyroid differentiation. It has been reported to be absent or faintly positive in malignant thyroid tumors. The study was carried out on 200 patients [172 females, 28 males, mean age 48].

The results are as follows: The sensitivity of DPP IV is 71%, and the specificity is 99%, respectively, with a 50% threshold of positive follicular cells in cytochemistry. The sensitivity is 71%, and the specificity is 94%, respectively, with a 5% threshold of positive follicular cells in histochemistry. DPP IV positivity is correlated with angioinvasion, capsuloinvasion, metastase, and oncocytes. The immunohistochemical detection of DPP IV/CD 26 using catalysed signal amplification has been introduced. The preliminary results are following: the sensitivity is 65%, and the specificity is 99%, respectively.

The sensitivity of TPO is 78%, and the specificity is 92%, respectively.

In a series of 36 tumors, both markers were estimated: the sensitivity is 81%, and the specificity is 96%, respectively. The assessment of both markers increased statistical parameters in this series.

The data suggest DPP IV and TPO to be helpful additional markers in differential diagnosis between malignant and benign thyroid tumors.

Project was supported by Charles University Grant Agency, No. 87/2000.

**Address for correspondence:** I. Kholová, Fingerland Dept. of Pathology, Faculty Hospital, CZ-500 05 Hradec Králové, Czech Republic

**Title of the research project:** Digitalization of fotodocumentation in modernization of biology course for dentistry.

**Grant Agency:** Ministry of Education

**Project Number:** 1736

**Principal Researcher:** Jana Kolářová

**Joint Researchers:** Miroslav Červinka, Emil Rudolf

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 120000

**Summary of 2001 results**

**Title of the presentation:** Digitalization of fotodocumentation in modernization of biology course for dentistry.

**Authors:** Jana Kolářová, Emil Rudolf, Miroslav Červinka

Fac. Med., Charles Univ., Hr. Králové: Dept. of Medical Biology and Genetics

Medical biology and genetics belong to the theoretical disciplines taught at Faculty of Medicine in Hradec Králové. To enhance the efficiency of its courses, it is recommended to complement them with an extensive, easily and quickly approachable fotodocumentation. The aim of this project, which is connected to the implementation of a new study curriculum for Dentistry, is to digitalize fotodocumentation, with the special focus on the characteristic features of some heritable conditions and most frequent tumors in the orofacial area. The resulting photographs originate from a vast photoarchive owned by the Stomatology clinic at Faculty teaching hospital in Hradec Králové. Digitalization has been effectuated by the digital camera Nikon COOLPIX 950 or using the scanner Hewlett Packard ScanJet 6200C. The resulting images were computer processed using the graphical program Corel PHOTO-PAINT 8, equipped with descriptions and commentary, and stored in the compressed format jpeg. This photodocumentation served as a basis for the preparation of Power Point presentations used during dentistry lectures and practical classes in the I. study year. Starting the winter semester 2001/2002, the presentations are available to the students at the Intranet computer LUCIA. Furthermore, we are planning on presenting some files on-line at the adresse: [www.biologie-lfhk.cz/](http://www.biologie-lfhk.cz/). This will enable all academics as well as students of our faculty to use them as an education and reference material.

Project was supported by the Ministry of Education Grant Agency, No. 1736.

**Address for correspondence:** J. Kolářová, Dept. of Medical Biology and Genetics, Charles Univ. in Prague, Fac. of Medicine in Hr. Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

***Title of the research project:*** Comparison of successes of the uncovered and partially covered dental implants using lateralisation of inferior alveolar nerve

***Grant Agency:*** Grant Agency of the Czech Republic

***Project Number:*** 304/01/P111

***Principal Researcher:*** Jiří Krug

***Joint Researchers:*** Antonín Šimůnek

***Starting date:*** 1.1.2001

***Duration (years):*** 3

***Funds allocated for project – total in Czech crowns:*** 669000

***Summary of 2001 results***

***Title of the presentation:*** Lateralisation of the inferior alveolar nerve in combination with placement of dental implants.

***Authors:*** Jiří Krug (1), Samer Kasabah (1), Radek Mounajjed (2), Miguel David Cevallos-Lecaro (1), Antonín Šimůnek (1)

**Faculty of Medicine of Charles University Hradec Králové: Department of Stomatology, Center of Dental Implantology (1), Private dental office, Hradební 586, Hradec Králové (2)**

The project is focused on the choice of the optimal type of the osseointegrated implant using the transposition of the inferior alveolar nerve from the bone defect point of view, which is created during finding, and preparing of the nerve. For this study we use three types of fixtures (titanium self-taped and plasma-sprayed fixtures, titanium implants with chemically etched and titanium implants hydroxy-apatite coated in the middle parts. We placed totally 10 implants in the lateral region of the lower jaw distally from mental foramen so that the lateralisation of the inferior alveolar nerve was necessary. Totally in 7 cases we did lateralisation of the nerve and three times we transposed the whole nerve. In all cases we placed titanium uncoated implants “Impladent” (Lasak Ltd.). From 10 implants, 6 of them were chemically etched of 3,7 mm of diameter (STI-Bio), the others were only plasma sprayed of 5,0 mm of diameter. In four fixtures, we placed fixtures bicortically, the others only monocortically. We evaluated the perception of the mental nerve one week after operation, one month and three months after the procedure. We were figuring out the sensitivity on sharp and blunt stimuli, ability to differentiate two points and movement of the brush v 10 mm distance. We published “Lateralisation of the inferior alveolar nerve in combination with dental implant placement” which is in press in Quintessence.

**Literature:** Babbush, CA.: Transpositioning and repositioning the inferior alveolar and mental nerves in conjunction with endosteal implant reconstruction. *Perio* 2000, 1998, 17, 183-190.

**Project was supported by the Grant Agency of the Czech Republic, No 304/01/P111.**

***Address for correspondence:*** Jiří Krug, Dept. of Stomatology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Sokolská, 500 05 Hradec Králové, Czech Republic



**Title of the research project:** Educational model of human body adaptation to physical load

**Grant Agency:** Ministry of Education

**Project Number:** 1732/F3

**Principal Researcher:** Miroslav Kuba

**Joint Researchers:** Jan Kremláček, Lenka Borská

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 190,000

**Summary of 2001 results**

**Title of the presentation:** Cardiovascular and metabolic changes during physical activity (practical classes in Pathophysiology)

**Authors:** Miroslav Kuba, Jana Szanyi, David Gayer, Jan Kremláček, Jana Chlubnová, František Vít

Charles Univ. in Prague, Faculty of Medicine in Hradec Králové, CZ: Dept. of Pathophysiology

During practical classes of medical students in Pathophysiology, dependence of the heart rate, blood pressure, glycemia, arterial pO<sub>2</sub>- and body temperature on the level of physical load (during bicycle ergometry) was evaluated in 140 healthy subjects (age range of 19-23 years).

"W170/kg" index (expressing the load in Watts/1kg of the body weight needed to achieve the heart rate 170/minute) was measured and compared with the "recovery index" (calculated from a decrease of the heart rate in the first minute after a physical load) provided by the ergometer ERGORACER (Kettler company, Germany). Interindividual differences were evaluated with respect to basic body parameters of subjects.

.....A mathematical model explaining relationships between acquired data is in construction. It will be used for better recognition of pathological reactions to physical activity.

Supported by the Czech Ministry of Education (grant No. 1732/F3).

**Address for correspondence:** E-mail: kuba@lfhk.cuni.cz



**Title of the research project:** Electrophysiological assessment of human cognitive processes

**Grant Agency:** J. S. McDonnell Found., USA      **Project Number:** 99-57EE

**Principal Researcher:** Miroslav Kuba

**Joint Researchers:** Jan Kremláček, Zuzana Kubová, Colin Blakemore, Philip Benson

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project – total in Czech crowns:** 1,983,000.-

**Summary of 2001 results**

**Title of the presentation:** Intraindividual variability of visually evoked cognitive potentials

**Authors:** Miroslav Kuba, Zuzana Kubová (1), Jan Kremláček, Jana Szanyi, Jana Chlubnová, František Vít, David Gayer

Charles Univ. in Prague, Faculty of Medicine in Hradec Králové, CZ: Depts. of Pathophysiology and Physiology (1)

Intraindividual circadian variability of cognitive responses (P300) to moving stimuli (coherent versus non-coherent linear motion recognition) was tested in a group of 6 healthy subjects. Additionally, P300 changes due to glycemia variations were evaluated and compared with changes in reactions from primary and secondary (associate) visual cortical areas.

Despite a larger interindividual variability (generally recognised feature), cognitive responses displayed no significant circadian changes in about constant glycemia. Controlled decrease of glycemia (to the lower border of a norm) was mostly detectable in cognitive responses only (prolonged latencies and amplitude decrease). Primary visual evoked potentials (pattern-reversal VEPs) displayed tendency to amplitude increase (equivalent of hyperreflexia in hypoglycemic status?).

Although these preliminary data must be verified in a larger group of subjects, they confirm the formerly reported higher sensitivity of the extrastriate visual cortex to changes in the internal environment of the body (Kuba M. et al.: Acta Medica (Hradec Králové, 1996, 39: 21-26).

Supported by James S. McDonnell Foundation for Cognitive Neurosci., USA, Grant No.99-57EE-GLO.04.

**Address for correspondence:** E - mail: kuba@lfhk.cuni.cz

**Title of the research project:** The importance of effective atrial contraction for sequential pacing

**Grant Agency:** Ministry of Health

**Project Number:** NA/5403-3

**Principal Researcher:** Jiří Kvasnička

**Joint Researchers:** Miroslav Měšťan, Vladimír Rozsival, Miloslav Tauchman, Zdeněk Tušl, Alena Štrasová, Karla Dominiková, Pavel Rejchrt, Jakub Střítecký, Vratislav Dědek, Miloš Táborský

**Starting date:** 1.1.1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 308000

#### **Summary of 2001 results**

**Title of the presentation:** Impact of the atrial contribution on pacing mode preferences

**Authors:** Miroslav Měšťan (1), Jiří Kvasnička (1), Anush Babu (1), Miloslav Tauchman (2), Jakub Střítecký (2)

Fac. Med., Charles Univ., Hradec Králové, Dep. of Internal Medicine (1), Faculty Hospital, Hradec Králové, Ist Dep. of Internal Medicine (2).

Atrial contribution (AC) to ventricular filling is a parameter, which is not commonly used in pacemaker practice as it is difficult to estimate it noninvasively. In 90's, we have developed a method, which allows noninvasive quantifying of the AC. The aim of this project was to determine whether the magnitude of the AC can help to individualise setting of pacemakers and to choose between a single-chamber or dual-chamber pulse generator.

In 2001, a total of 22 patients with preserved atrial activity were enrolled. All patients gave their informed consents. Quantification of the AC was successfully done in 20 patients. All patients were randomly assigned into two groups which were followed and underwent the exercise testing on bicycle ergometry. Each patient absolved the exercise testing in both the VVIR and DDDR pacing mode according the cross-over design of the study. All patients repeatedly filled in the quality of life questionnaire (QOL) after two fourteen day periods in their assigned pacing mode (VVIR or DDDR).

On the follow-up, seven serious adverse events (SAE) were noted in the group set to the VVIR mode (1 stroke, 1 permanent atrial fibrillation, 2 cases of congestive heart failure and 3 cases of pacemaker syndrome) while only 1 SAE was noted in the group set to the DDDR mode (stroke). Significant differences were found in 13 out of the 19 different questions of QOL ( $P < 0,04$ ). All the worse scores were noted in the group of patients set to the VVIR mode. Of special interest were the negative relationships found between the AC and the maximal rate-pressure product ( $P < 0,01$ ) achieved during exercise testing in both the DDDR mode ( $P < 0,01$ ) and in the VVIR mode ( $P < 0,05$ ).

Thus, in patients with preserved atrial activity the DDDR mode seems to be clearly superior to the VVIR mode, possibly also because of negative influence of the AC in the VVIR mode.

**Address for correspondence:** J. Kvasnička, Ist Dep. of Internal Medicine, Faculty Hospital, 500 05 Hradec Králové, Czech Republic



**Title of the research project:** Transparence of intraocular lens and its influence on diferential ability of the eye

**Grant Agency:** Czech Republic

**Project Number:** 309/00/D056

**Principal Researcher:** Hana Langrová

**Joint Researchers:** Dagmar Hejcmanová

**Starting date:** 01.09.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 707000

**Summary of 2001 results**

**Title of the presentation:** Transparence of intraocular lens and its influence on diferential ability of the eye

**Authors:** Hana Langrová, Dagmar Hejcmanová, J. Peregrin, L. Bytton-Diaz, M. Hovorková, A. Feuermannová, P. Rozsival

Charles University in Prague, Faculty of Medicine in Hradec Králové, Dept. of Ophthalmology

The aim of our study is: 1. to objectivize and quantificate subjective complains in conditions of lower contrasts and under glare a) in patients with early cataract before and after cataract surgery, b) in patients after YAG capsulotomy because of secondary cataract, 2. to examine visual functions in myopes undergoing a) implantation of phakic intraocular lenses, b) photorefractive keratectomy (PRK), c) laser in situ keratomileusis (LASIK) for correction of the refractive error.

The examinations of patients with early cataract preoperatively and after cataract surgery were continued (n=40) and evaluated. The significant improvement of the best corrected visual acuity and contrast sensitivity without glare and under glare in 20 artephakic patients after YAG capsulotomy because of secondary cataract was presented and the manuscript was prepared. Myopes (n=20) undergoing implantation of phakic IOL were examined preoperatively and 1 and 3 months after surgery. The postoperative improvement of majority of parameters tested will be presented next year. The comparison of visual functions in myopes after PRK (n=41) and LASIK (n=31) was presented and published.

**Address for correspondence:** Hana Langrová, MD, PhD., Charles University, Dept. Ophthalmology, 500 05 Hradec Králové, e-mail: langrovah@lfhk.cuni.cz

**Title of the research project:** Pathogenesis, diagnosis and therapy of malignant diseases

**Grant Agency:** MSMT

**Project Number:** 111500002

**Principal Researcher:** Jaroslav Malý

**Joint Researchers:** Jan Pechl, Emil Rudolf, Miroslav Červinka, Zdeněk Fiedler, Vladimír Geršl, Michaela Adamcová, Milan Rešl, Pavel Jandík, Zbyněk Vobořil, Jan Bureš, Marcela Kopáčová, Jiří Horáček, Alice Poznarová, Jaroslav Malý, Martin Blažek, Bohuslav Melichar, Pavlína Králíčková, Miloslav Kmoníček, Pavel Žák, Ladislav Jebavý

**Starting date:** 1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:**

**Summary of 2001 results**

**Title of the presentation:** Pathogenesis, diagnosis and therapy of malignant diseases

**Authors:** Jaroslav Malý, Jan Pechl, Emil Rudolf, Miroslav Červinka, Zdeněk Fiedler, Vladimír Geršl, Michaela Adamcová, Milan Rešl, Pavel Jandík, Zbyněk Vobořil, Jan Bureš, Marcela Kopáčová, Jiří Horáček, Alice Poznarová, Martin Blažek, Bohuslav Melichar, Pavlína Králíčková, Miloslav Kmoníček, Pavel Žák, Ladislav Jebavý

Work in the third year of the project concentrated in the experimental part on the following research cycles:

- a. study of tumor cells invasiveness and its possible influencing in the conditions in vitro
- b. cardiotoxicity, prediction of cardiotoxicity and potential cardioprotective effectiveness of new antineoplastic substances

In the clinical part were the following research cycles:

- a. morphology of gene regulation disorders in relation to biological behavior of the pulmonal carcinoids
- b. timely diagnosis of colorectal tumor, mutation of Ki-RAS oncogenes
- c. timely diagnosis of recurrence and metastasis of colon tumor by immunoscintigraphic meansd. breathing tests with utilization of natural isotope of carbon <sup>13</sup>C, complex functional GIT diagnosis during and after cytostatic treatment
- e. treatment of hemoblastosis and some immunopathological diseases by allogeneous graft after nonmyeloablative regimen
- f. acquired thrombophile conditions in the patients with hemoblastosis and tumor diseases and their treatment
- g. monitoring and prophylaxis of multiorgan failure in the patients with hematological malignities and septic complications of bone marrow transplant treatment.

We evaluated the first results in the field of carcinoma cell lines, nephrotoxicity of cytostatics, haemostatic changes of the 211 patients with hemoblastosis were evaluated and we transplanted 72 patients with haematological malignancy upon various conditioning.

**Address for correspondence:** Jaroslav Malý, 2nd Dept of. Medicine, Faculty of Medicine, Charles Univ. Hradec Králové

**Title of the research project:** Fluid balance and neuromuscular disorders in critical illness

**Grant Agency:** Ministry of Health

**Project Number:** NB51-97/3

**Principal Researcher:** Jan Maňák, Department of Metabolic Care, University Hospital Hradec Králové

**Joint Researchers:** Schreiber M.(2), Kunc P(2), Matulová H.(2), Havel E(1), Cerman J.(1) Pára F.(2) , Sobotka L.(1), Zadák Z.(1)

(1) Dept.of Metabolic Care and Gerontology, University Hospital Hradec Králové

(2) Dept. of Neurology, University Hospital, Hradec Králové

**Starting date:** 1.1.1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 556000

**Summary of 2001 results**

**Title of the presentation:** Fluid balance and neuromuscular disorders in critical illness

**Authors:** Maňák J., Schreiber M., Kunc P, Matulová H., Havel E, Cerman J. Pára F. , Sobotka L., Zadák Z.

In severe sepsis , massive fluid resuscitation is needed to achieve haemodynamic stability. Due to the capillary leakage, fluid retention with oedema formation occurs. Severe muscle weakness evolves frequently further in the course of the illness, delaying the weaning from mechanical ventilation and prolonging the length of stay in the hospital. The relationship between the fluid retention and neuromuscular condition has never been studied in the literature. Objective: to describe the relationship between the fluid retention and neuromuscular parameters. Setting: 10 bed medical ICU in an university hospital. Patients: 28 patients (mean 58 (42-78)years) with severe sepsis and consequent limb weakness (no movement against gravity). Parameters: Fluid retention: curves of cumulative fluid balance during the hospital stay were obtained. The slope of the fluid accumulation and oedema mobilisation, maximum fluid retention and area under the curve were calculated. Neuromuscular condition: electrophysiologic examination of peripheral nerves (conduction velocities, action potentials of motor and sensitive nerves) and muscles (spontaneous electrical activity). Clinical: severity of organ failure (SOFA score), biochemical and haematologic laboratory examination. Results: Out of the 28 patients, complete data were collected in 14. In electrophysiology, in 13 patients signs of axonal polyneuropathy were found, one patient had myopathic features. No correlation between electrophysiological findings and parameters of fluid balance was found. Significant correlation was between the decrease in compound muscle action potential and maximum SOFA score ( $r=0,7;p=0,002$ ). Conclusion: no correlation was found between the amount of fluid accumulated and electrophysiological changes. More likely, the neuromuscular changes can be regarded as a part of multiple organ failure.

**Address for correspondence:** Jan Maňák, Dept. of Metabolic Care, University Hospital, Sokolská 408, 500 05 Hradec Králové, Czech Republic

**Title of the research project:** Continuous biochemical monitoring of patients during open-heart surgery with cardiopulmonary bypass and during postoperative care using interstitial microdialysis

**Grant Agency:** Ministry of Health

**Project Number:** 6547-3

**Principal Researcher:** Jiří Mandáček

**Joint Researchers:** Vladimír Lonský, Pavel Živný, Vladimír Palička, Pavel Kuneš, Jaroslav Kubíček, Magdalena Holečková

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1592000

#### **Summary of 2001 results**

**Title of the presentation:** Biochemical monitoring of metabolic changes and tissue blood flow in skeletal muscle during cardiac operation and postoperative care by interstitial microdialysis (preliminary report)

**Authors:** Jiří Mandáček, Pavel Živný, Vladimír Lonský, Vladimír Palička, Pavel Kuneš, Jaroslav Kubíček, Magdalena Holečková. Dep. Cardiac Surgery and Inst. Clinical Biochemistry, Charles University Hospital, Hradec Králové, Czech Republic

**Purpose:** Serious complication of cardiac surgery using cardiopulmonary bypass (CPB) could be a hypoperfusion of peripheral tissues and splanchnic organs. The aim of this study is the monitoring of metabolism and interstitial blood flow in peripheral tissue during cardiac surgery and postoperative care by interstitial microdialysis.

**Methods:** 20 patients operated using CPB were investigated. Interstitial microdialysis was performed by 2 probes CMA 60 inserted into the patient's musculus deltoideus. Samples were collected in exact intervals. Estimations in obtained dialysates were glucose, urea and lactate. The tissue blood flow was monitored by original dynamic microdialysis with gentamicine as a marker.

**Results:** The concentrations of dialysates were significantly lower during CPB in comparison with period after weaning CPB and postoperative care. Glucose  $1.47 \pm 1.3$  (median 1.7) vs.  $4.05 \pm 1.52$  (med.4.6), urea  $1.65 \pm 1.42$  (med.1.8) vs.  $3.76 \pm 1.63$  (med.3.3), lactate  $0.93 \pm 0.92$  (med.1.0) vs.  $2.32 \pm 0.89$  (med.2.1). The interpretation of these results could be modified by the significantly lower volumes, 3-5 times, of obtained microdialysis samples during CPB.

Simultaneous tissue perfusion measurement using microdialysis perfusion solution supplemented with gentamicine indicated markedly lower perfusion of peripheral tissue during CPB (preliminary results).

**Conclusions:** The lower concentrations of glucose, urea and lactate in skeletal muscle during CPB are influenced by dramatic changes in tissue perfusion, capillary fluid pressure and osmotic changes during CPB. Simultaneous measurement of tissue perfusion, sample volume and changes in microdialysis solution composition ( $\text{Na}^+$ ,  $\text{K}^+$ ) seems to be necessary in microdialysis studies with expected rapid tissue flow and osmotic changes.

**Address for correspondence:** J.Mandáček MD, PhD. Dep. Cardiac Surgery, Univ. Hospital, Hradec Králové, Czech Republic. e-mail: jiri.mandak@centrum.cz

**Title of the research project:** Social Support among Children and Adolescent in Stressful Situation (Psychosocial Perspective)

**Grant Agency:** Czech Republic

**Project Number:** 406/01/0659

**Principal Researcher:** prof. PhDr. Jiří Mareš, CSc.

**Joint Researchers:** prof. PhDr. Jaro Křivohlavý, CSc., doc. MUDr. Věra Hubková, CSc., PhDr. Marie Rybářová, Jaroslava Pečenková, MUDr. Jana Marešová, Mgr. Jana Bavorová, Mgr. Alena Vodová, doc. PhDr. Bohumil Koukola, CSc., MUDr. Miroslav Dostálek, PhDr. Jaroslava Králová, MUDr. David Skorunka, MUDr. Lubomír Hadaš, MUDr. David Komárek

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1088

#### **Summary of 2001 results**

**Title of the presentation:** Social Support among Children and Adolescent in Stressful Situation (Psychosocial Perspective)

**Authors:** Jiří Mareš, Fac. Med., Charles Univ., Hr. Králové: Dept. Social. Medicine

The outputs of the year 2001 may be summarized into 6 areas. Survey studies: mapping the new approach in the psychology orientated on surveying the positive aspects in individuals during functioning of both the small groups and big human communities assessing the main theoretical approaches to the social support research analysis of social definitions survey of concrete methods for diagnostics of social support in children, the survey study concerning the sources of social support: family in general, mothers, nurses, playing therapists, teachers and educators for the special hospital school, summarizing studies of stumbling blocks and risks of the social support. Verification of the diagnostical methods: translation of selected diagnostical methods: SSQ6, SSS, SRI, MSPS, authentication of selected questionnaire methods on the sample of children and adolescents: SSQ6 on the 1176 pupils within the age span 10-18 years, verification of the "map" of social support and "thermometer" of this help in admitted children. Empiric research of social support in specific groups of children and adolescents: in chronically ill children, in paediatric hematological-onkological patients, in operated squint-eyed children, in adolescents accused from the criminal act. Intervention ways: using the family therapy when working with clients and detailed risk of social support. Technical outcomes: CD ROM with the file covering the identification data of 30 paediatric haematological-onkological patients and of their 30 drawn answers, CD ROM with picture material concerning selected medical procedures - aimed on the work of playing specialist preparing the children for painful procedures. WWW pages of the research workers. Publication outcomes: 1 monography, 1 reader reports, 8 magazine articles, 18 articles in reports, English-Czech dictionary of terminology from the sphere of social support.

**Address for correspondence:** J. Mareš, Dept of Social Medicine, Charles University Faculty of Medicine Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic



**Title of the research project:** Inovation of Medical Curriculum

**Grant Agency:** Ministry of Education

**Project Number:** 111500005

**Principal Researcher:** prof. PhDr. J. Mareš, CSc.

**Joint Researchers:** doc. MUDr. Věra Hubková, CSc., doc. MUDr. Alena Stoklasová, CSc., prof. MUDr. RNDr. Miroslav Červinka, CSc., doc. MUDr. Zuzana Čevrínková, CSc., prof. MUDr. Ivo Šteiner, CSc., prof. MUDr. Jiřina Martínková, CSc., doc. MUDr. Jindra Šmejkalová, CSc., doc. MUDr. Yvona Mazurová, CSc., doc. MUDr. Jaroslav Mokřý, doc. MUDr. Antonín Hlava, CSc., doc. MUDr. Jan Vokurka, CSc., doc. MUDr. Vladimír Palička, CSc., doc. MUDr. Danuše Šubrtová, CSc., MUDr. Olga Procházková

**Starting date:** 1.1.1999

**Duration (years):** 5

**Funds allocated for project - total in Czech crowns:** 712000

**Summary of 2001 results**

**Title of the presentation:** Inovation of Medical Curriculum

**Authors:** Jiří Mareš, Fac. Med., Charles Univ., Hr. Králové: Dept. Social. Medicine

Solving the research design in the year 2001 went on in agreement with the plan and took place on four different levels. Above faculty level: an aimed gathering and scrutinizing the foreign experience - there were done analytical and comparative activities concerning different approaches to curriculum innovation on some foreign medical faculties. California State University, Medical School at Los Angeles and Medical School at San Francisco were visited. Also the pan-European cooperation in the field of pharmacology continued within the frame of Ephar Net project. Our faculty belongs to 6 European places verifying the exchange of electronic lecture texts. Faculty level of study programme: For the second year there went on the verification of the new curriculum in stomatological studies. The basic strategy of curriculum changes in general medicine studies was agreed on: to reduce the obligatory part of teaching, open a wider space for optional subjects, do not limit the elected subjects on specific year but to allow the students to make their choice during all the higher years, to reduce numbers of lectures and intensity the practical and seminary forms of teaching, coordinate both the contents and terminology of teaching within single years and even between separate years, to amplify the intensity of practical and family medicine education. The whole faculty level: The inquiry among the students of all the years, as well as among those graduated into their opinions as for the teaching quality in different subjects and possible curriculum changes were carried out. Two studies were performed: one concerning the preparation of students for their contact with patients - members of ethnic, religious and other minorities, and the second one concerning hidden curriculum on the Medical faculty. There were also performed partial innovations in many departments at the faculty.

**Address for correspondence:** J. Mareš, Dept of Social Medicine, Charles University Faculty of Medicine Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:**

Congenital disorders of glycosylation (CDG), screening and diagnostics

**Grant Agency:** Charles University**Project Number:** 85/2001**Principal Researcher:** Eliška Marklová**Joint Researchers:** Jaroslava Vávrová, Ziad Albahri, Václava Menclová, Ondřej Renc, Monika Říhová**Starting date:** 1. 1. 2001**Duration (years):** 3**Funds allocated for project - total in Czech crowns:** 750 000**Summary of 2001 results****Title of the presentation:**

Isoelectric focusing of transferrin in the screening of congenital defects of protein glycosylation

**Authors:** Eliška Marklová

Dept. of Pediatrics, Fac. Med. and Teaching Hosp., Charles University, Hradec Králové

The carbohydrate-deficient glycoprotein syndromes are caused by deficiency of various enzymes in the process of protein glycosylation. This recently recognised group of metabolic disorders is characterised by disturbance of many physiological functions and a broad spectrum of symptoms. Diagnosis and differentiation in several types involves the demonstration of pathological glycosylation patterns of serum glycoproteins and decreased enzyme activities in leukocytes or fibroblasts. The aim of the first stage of the research project was to introduce a method for the screening of the congenital disorders of glycosylation (CDG), which has not been performed in our country so far. From the various methods referred in the literature we have chosen the planar arrangement of isoelectric focusing of transferrin (TF), using rehydrated Immobiline dry gels (Pharmacia), anti-IgG-TF immuno-fixation, Coomassie-blue detection and densitometric evaluation. We have checked up conditions of the procedure respecting the sample pre-treatment, the gel hydration, volume and the manner of the sample application, the storage conditions when discontinuous analysis used, the method sensitivity and reproducibility. Over 70 healthy persons of various ages and 170 children with a possible congenital metabolic defect have been examined. Serum of alcohol abusers served as a pathological reference sample. No patient with a specific defect of glycosylation (expected incidence 1: 40 000) has been screened out so far.

Literature:

E. Marklová, Dědičné poruchy glykosylace (CDG). Čes.-slov. Pediat. 56, 2001, 3, 143-148.

Project was supported by the Charles University Grant Agency, No 85/2001/C/LFHK.

**Address for correspondence:** E. Marklová, Dept. of Pediatrics, Charles University in Prague, Faculty of Medicine and Teaching Hospital in Hradec Králové, 500 05 Hradec Králové, CR

**Title of the research project:** Population modelling of wanted and unwanted clinical outcome and surrogate parameters

**Grant Agency:** Ministry of Education

**Project Number:** OC B15.10

**Principal Researcher:** Jiřina Martínková

**Joint Researchers:** J. Chládek, J. Grim, M. Šimková, J. Vaněčková, V. Koudelková, M. Nožičková, O. Kalous, M. Doubek, J. Mayer, L. Malášková, M. Dastych

**Starting date:** 1.1.2001

**Duration (years):** 5

**Funds allocated for project - total in Czech crowns:** 2400000

#### **Summary of 2001 results**

**Title of the presentation:** Modelling of low dose methotrexate pharmacokinetics (PK) and pharmacodynamics (PD) in therapy of severe psoriasis. Population pharmacokinetics of high-dose busulfan in bone marrow transplant patients

**Authors:** J. Grim, J. Chládek, J. Martínková (1), M. Šimková, J. Vaněčková, V. Koudelková, M. Nožičková (2), O. Kalous, M. Doubek, J. Mayer (3), L. Malášková, M. Dastych (4)  
Fac. Med., Charles Univ., Hr. Králové, Dept. of Pharmacology (1), Dept. of Dermatology (2), Fac. Med., Hospital Brno, 1-rst Dept. of internal medicine-haemato-oncology (3) and Dept. of Biochemistry (4).

Two prospective studies investigated PK and PD of LDMTX given orally as a bolus dose (Study A) or as a triple dose regimen (Study B) to 41 patients (24 men and 17 women) with resistant forms of psoriasis. PK of MTX was investigated at weeks 1 and 13 and PD was assessed monthly using the Psoriasis Area and Severity Index Score system (PASI score). PK/PD analysis revealed a significant indirect relationship between PASI score (skin clearing effect) and AUC MTX ( $\rho = -0.65$ ,  $p < 0.0001$ ). The AUC of MTX higher than 3000 nmol.h/L was found in 91% responders (11 subjects with higher than 80% drop in PASI) and only 15% nonresponders and was therefore associated with a significantly better outcome ( $p < 0.001$ , Fisher's test). Moreover, PK/PD relationships were defined which allow to predict acute adverse effects (headache) and long-term toxicity (hepatotoxicity).

Between 1998 and 2001, we have monitored plasma levels of busulfan in high-dose (HDBUS) settings in 46 patients (aged  $44 \pm 10$  yr, 24 females and 22 males) who underwent peripheral blood stem cell transplantation at the University Hospital in Brno. Busulfan was given orally every 6 hours at days -7 to -4 prior to the day of transplant. The standard single dose of busulfan 1 mg/kg of ideal body weight was flexibly adjusted with the help of therapeutic drug monitoring in order to achieve a target range of 300-600 microg.h/ml for the AUC. A very low incidence of adverse effects (8.3 %) was observed. Venooclusive liver disease occurred in 1 patient. Early posttransplant mortality was 10.4 %. Pharmacokinetically guided dosing of HDBUS resulted in an improved outcome of transplantations.

**Address for correspondence:** J. Chládek, Department of Pharmacology, Charles University, Faculty of Medicine, Šimkova 870, Hradec Králové, 500 01, grimj@lfhk.cuni.cz

**Title of the research project:** Population pharmacodynamic/pharmacokinetic modelling in pharmacology.

**Grant Agency:** COST

**Project Number:** B15.30

**Principal Researcher:** Prof. MUDr. Jiřina Martínková, CSc.

**Joint Researchers:** Stanislav Mičuda, Jolana Cermanova, Lucie Valentová, Jaroslav Chládek

**Starting date:** 1.1.2000

**Duration (years):** 4

**Funds allocated for project - total in Czech crowns:** 450000

**Summary of 2001 results**

**Title of the presentation:** Influence of memantine on activity of hepatic microsomal CYP1A2, CYP2D6 and CYP3A4.

**Authors:** Stanislav Mičuda, Jolana Cermanova, Lucie Valentová, Jiřina Martínková, Jaroslav Chládek

Department of Pharmacology, Charles University in Prague, Faculty of Medicine in Hradec Králové

First, the study was undertaken to estimate the influence of memantine (a new compound important for treatment of dementia) on cytochrome CYP1A2, CYP2D6 and CYP3A4 metabolic activities. In vitro experiments using rats and human liver microsomes show significant inhibition of CYP1A2-associated ethoxyresorufin O-deethylation.  $K_i$  (63.75 microM) is much higher than the maximum plasma concentration of memantine recommended for long-term therapy (0,5 microM). Neither CYP2D6 (dextromethorphan O-demethylation) nor CYP3A4 (dextromethorphan N-demethylation) were inhibited by memantine. In conclusion, these data suggest that the potential of memantine for metabolic drug interactions is very low.

Second, concerning hepatic clearance of drugs, a model of isolated perfused rat liver (IPRL) was optimized to enable an evaluation of drug interaction at the level of hepatobiliary excretion (biliary clearance). The interaction between methotrexate (MTX – 40 microM) and cyclosporine A (CsA – 1mg/L) was analyzed using single-pass perfusion (at steady state conditions). Preliminary results seem to demonstrate that co-administration of CsA reduces biliary excretion of MTX by a 38 %. Mechanisms of this interaction and its clinical importance are to be analyzed.

This study was performed within the framework of the COST B15.30 project.

**Address for correspondence:** Jirina Martinkova, Faculty of Medicine in Hradec Kralove, Simkova 870, 500 01 Hradec Kralove, Czech Republic

**Title of the research project:** Innovation of teaching pharmacology in relation to EPHARNET (a project of EC).

**Grant Agency:** Ministry of Education

**Project Number:** 1731

**Principal Researcher:** Jiřina Martínková

**Joint Researchers:** Jiří Kvasnička, Jiří Ceral

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 206000

**Summary of 2001 results**

**Title of the presentation:** Our contribution to EPHARNET focused on treatment with antihypertensive drugs.

**Authors:** Jiřina Martínková (1), Jiří Kvasnička (2), Jiří Ceral (3), Ivan Tůma (4), Jaroslav Kačerovský (5)

Fac.Med., Charles Univ., Hr. Králové: Dept. of Pharmacology (1), First Dept. of Internal Medicine (2,3), Dept. of Psychiatry (4), Second Dept. of Internal Medicine (5)

The aim of the project was to join the EPharNET project (EC) focused mainly on etiopathogenesis and treatment of hypertension. Within this framework a new software (on CD-ROM) devoted to hypertension was created and Prof. Martínková was named as one of 11 contributors to the content. Moreover, Prof. Martínková and co-authors developed 9 case-reports (computer-assisted interactive studies in Czech and English), helpful for teaching both experimental pharmacology (for students in years 3 and 4) and clinical pharmacology (for students in year 5).

**Address for correspondence:** Jiřina Martínková, Faculty of Medicine in Hradec Králové, Dept. of Pharmacology, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Connecting the student dormitory "Na kotli" to the internet via the metropolitan area network "HKNET"

**Grant Agency:** Ministry of Education

**Project Number:** 1743/A

**Principal Researcher:** Vladimír Mašín

**Joint Researchers:** Jindřich Andrš

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 2801000

**Summary of 2001 results**

**Title of the presentation:** Connecting the student dormitory "Na kotli" to internet

**Authors:** Vladimír Mašín (1), Jindřich Andrš (2)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Biophysics (1),  
Fac. Pharm., Charles Univ., Hr. Králové: Computer centre (2)

The access to the internet from student dormitories is in the academic environment a quite common way of satisfying demands for internet connection for students. There has been no such opportunity for Charles University students in Hradec Králové until now.

We decided to build a Local Area Network (LAN) in the buildings of the student dormitory "Na kotli" and connect this LAN to the Faculty of Pharmacy, which is the closest to the hostel of all the nodes of the Metropolitan Area Network (MAN) HKNET, which is connecting all academic institutions in Hradec Králové to the internet.

All five buildings of the dormitory were connected together by the optical backbone network, using a multi-mode fiber optic, while for connections within buildings Cat 5E metallic cabling was used. The network consists of the total of 147 end-user connections, all of which are connected to 100 Mb/s switches Cisco 2950. Also the backbone network is using the same speed.

The connection to the Faculty of Pharmacy is using a single-mode fiber optic and was built in cooperation with the University of Hradec Králové. Its speed is 100 Mb/s.

The network of the student hostel is using IP addresses from the intranet range, which are translated to one public address by Network Address Translation service (NAT), provided by a PC running Windows 2000 Server.

We also built two small computer labs in the hostel, each with five computers.

In case the demand increases to more internet connections for students it should be possible to increase number of end-user connections in the hostel quite easily, with minimal expenses.

Project was supported by the Ministry of Education Grant Agency, No 1743/A

**Address for correspondence:** Vl. Mašín, Dept. of Biophysics, Charles University in Prague, Medical faculty in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Neural transplantation into experimental model of Huntington's disease.

**Grant Agency:** Ministry of Health

**Project Number:** 5400-3/99

**Principal Researcher:** Doc. MUDr. Yvona Mazurová, CSc.

**Joint Researchers:** RNDr. Věra Valoušková, CSc., Prof. MUDr. Josef Špaček, DrSc.

**Starting date:** 1.1.1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 829000

#### **Summary of 2001 results**

**Title of the presentation:** Neural transplantation into experimental model of Huntington's disease.

**Authors:** Mazurová Yvona (1), Valoušková Věra (2), Špaček Josef (3)

Charles Univ., Fac. Med. in HK: Dept. Histol. Embryol. (1), The Fingerland Dept. Pathol. (3); Acad. Sci. - Inst. Physiol., Prague (2)

Transplantation (TR) of fetal neural tissue appears to be promising treatment also for Huntington's diseased (HD) patients. To better understand the role of fetal neural graft in alleviating HD pathology, we used an animal model to characterize: 1) host/graft interaction; 2) changes in proliferative activity of the subependymal layer (SEL) of lateral brain ventricles in reaction to the neurotoxic lesion and following neural TR.

Neurodegenerative changes within the striatum of the rat brain (Long-Evans strain, n = 58) were induced mostly unilaterally by ibotenic acid (IA). TR of mesencephalic tissue (ED 10, 13, 15) was performed 1 week later (n = 29). Rats were sacrificed 2 weeks, 1, 3, 6 and 9 months after TR. Particularly immunohistochemical methods were used for morphological evaluation.

Graft's structure was influenced rather by the age of donor/fetus than by the length of animals' survival. Host/graft interaction was evident also in long-term surviving rats. We were interested in reaction of SEL especially in long-term surviving animals with respect to long-lasting degenerative process in the brain of HD patients. Increased proliferation in SEL (represented mostly by GFAP-positive astrocytes) was highest in IA-lesioned rats, any less in sham-lesioned and sham-transplanted animals surviving 1 and 3 months after operation, in comparison with the intact brains. The intensity of SEL reaction markedly decreased in 6- and 9-month surviving animals. Surprisingly, in grafted rats the proliferative rate within SEL was always lower in comparison with contralateral, non-lesioned side. It can be supposed, that fetal intrastriatal graft diminishes the reaction of SEL owing to its overall positive influence on the degenerated striatum.

**Address for correspondence:** Y. Mazurová, Dept. Histol. Embryol., Charles Univ. in Prague, Fac. Med. in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Digital microscopy: Modernisation of laboratory classes in histology and embryology

**Grant Agency:** Ministry of Education

**Project Number:** 1742/H/01

**Principal Researcher:** Jaroslav Mokrý

**Joint Researchers:** Danuše Šubrtová, Michal Souček

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 751000

**Summary of 2001 results**

**Title of the presentation:** Innovation of laboratory classes in histology and embryology: Equipment for digital microscopy

**Authors:** Jaroslav Mokrý (1), Danuše Šubrtová (1), Michal Souček (2)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Histology and Embryology (1), Computer Technology Centre (2)

Project was utilized for equipment of classroom of the Department of Histology and Embryology with apparatuses for taking microphotographs (consisting of the light microscope Olympus BX-51 and digital camera Camedia C4040) and their projection to students (using two videomonitors). To ensure intelligibility and audibility of teacher's comments, the classroom was equipped with microphones, reproboxes and power mixer and amplifier. Integration of all elements was carried out with the use of the graphic and multimedial station allowing multitask processing. This station was used for recording and archivation of microphotographs, didactic schemes and cartoons, preparation of computational teaching presentations and supplemented for a necessary software. All the components were installed in the classroom and they will be utilized in teaching from the summer semester 2002. Furthermore the project allowed us to supply departmental library with modern textbooks as well as instructional books describing management of the installed software.

The whole equipment guarantees an object teaching of practical histology while increasing effectiveness of the teaching process.

**Address for correspondence:** Doc. MUDr. Jaroslav Mokrý, Ph.D., Department of Histology and Embryology, Charles University Medical Faculty, Šimkova 870, 500 01 Hradec Králové



**Title of the research project:** Characterization of differentiation potential of neural stem cells

**Grant Agency:** Czech Republic

**Project Number:** 304/00/0338

**Principal Researcher:** Jaroslav Mokrý

**Joint Researchers:** Jana Karbanová, Stanislav Filip, Stanislav Němeček, Dana Duspivová, Miloslav Uher, Jaromír Lukáš, Věra Palečková

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1465000

#### **Summary of 2001 results**

**Title of the presentation:** Conversion of neural stem cells into endodermal and blood cells

**Authors:** Jaroslav Mokrý (1), Jana Karbanová (1), Stanislav Filip (2)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Histology and Embryology (1), Dept. of Oncology and Radiotherapy (2)

It has been postulated that organ-specific stem cells (SCs) give rise to progeny that differentiates exclusively in cells specific for a given organ. However, recent data confirm that the differentiation potential of SCs is broader and under suitable stimulation, SCs may generate cells of any kind. The aim of this project was to characterize plasticity of neural SCs. We used neural SCs isolated from the forebrain of E14 Balb/c mouse fetuses using the neurosphere assay. Spontaneous differentiation of multipotent NSCs (induced by neural grafting or by replacement of EGF and FGF-2 from culture medium with serum) resulted in production of neuronal and glial cells.

To find out whether NSCs can be stimulated to produce non-neural cell types, we exposed NSCs to different conditions. In in vitro experiments, NSCs labelled with exogenous beta-galactosidase were mixed with embryonic stem (ES) cells in hanging drops to form chimeric embryoid bodies. Cystic embryoid bodies were harvested after 9-25 days, stained with X-Gal (to identify labelled NSCs) and processed for histology. Sections revealed that in this assay, neural SCs generate endodermal cells above all, only sporadic blood cells located in generated blood islands contained X-Gal positivity. For in vivo tests, NSCs were injected into sublethally irradiated recipient mice. Counting CFU-GM colonies yielded from the spleen and bone marrow of irradiated animals confirmed that mice injected with NSCs revealed increased haematopoiesis when compared with untreated irradiated animals.

Our results indicate that NSCs exhibit features of remarkable plasticity and they can produce non-neural cell types. Chimeric embryoid bodies represent a novel in vitro model for testing stem cell plasticity.

Project was supported by the grant No. 304/00/0338 from the Grant Agency of the Czech Republic.

**Address for correspondence:** Doc. MUDr. Jaroslav Mokrý, Ph.D., Department of Histology and Embryology, Charles University Medical Faculty, Šimkova 870, 500 01 Hradec Králové



**Title of the research project:** Immunohistochemical detection of nestin as a diagnostic marker in pathomorphology

**Grant Agency:** Ministry of Health

**Project Number:** 6727-3/2001

**Principal Researcher:** Jaroslav Mokrý

**Joint Researchers:** Jana Karbanová, Danuše Šubrtová, Stanislav Němeček, Dana Duspivová, Miloslav Uher, Jiří Ehrmann, Zdeněk Kolář

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1953000

**Summary of 2001 results**

**Title of the presentation:** Newly formed endothelial cells express intermediate filament nestin

**Authors:** Jaroslav Mokrý, Jana Karbanová

Fac. Med., Charles Univ., Hr. Králové: Dept. of Histology and Embryology

Intermediate filament nestin is temporarily expressed in sporadic cell types during certain phases of their development. Terminal cell differentiation is associated with the loss of immunoreactivity. We observed the same phenomenon in developing endothelial cells. Our previous findings have shown that abundant nestin expression occurs during angiogenesis in vascular endothelial cells of a variety of developing tissues incl. extraembryonic structures (chorion, umbilical cord, placenta) and intraembryonic connective tissue and developing organs (e.g. brain, liver, lung, heart, spleen, gut, limb buds). To answer the question whether endothelial nestin is expressed during vasculogenesis we examined the immunoreactivity of blood vessels in cystic embryoid bodies. Surprisingly, endothelium lining blood islands or primitive vessels in embryoid bodies did not express nestin indicating that molecular regulation of angiogenesis differs from the process of vasculogenesis.

As tissues and their blood vessels matured, they lost nestin from the cytoskeleton of endothelial cells (nestin being gradually replaced with vimentin). Occasional identification of nestin in sporadic endothelial cells of adult tissues is associated with physiological turnover of these cells. When we detected nestin in sections of adult rat brains transplanted with neural grafts or glioma cells, i.e. the tissue whose growth induced neovascularization, we observed widespread immunoreactivity for nestin in all capillaries that vascularized the growing implanted tissue. No reactivity was seen in vessels of distant and intact areas of the host brain. We conclude that IF nestin represents one of the structural molecules that are crucial for formation of new blood vessels in the process of angiogenesis.

Project was supported by the grant No. 6727-3/01 from the grant Agency of the Ministry of Health.

**Address for correspondence:** Doc. MUDr. Jaroslav Mokrý, Ph.D., Department of Histology and Embryology, Charles University Medical Faculty, Šimkova 870, 500 01 Hradec Králové

**Title of the research project:** Reactive oxygen species in pathogenesis of acute pancreatitis and antioxidative treatment

**Grant Agency:** Ministry of Health

**Project Number:** NB/6043-3

**Principal Researcher:** František Musil

**Joint Researchers:** Zdeněk Zadák, Luboš Sobotka, Dagmar Solichová, Jan Maňák, Milan Kaška

**Starting date:** 1.1.上午十二上午十二

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 417000

**Summary of 2001 results**

**Title of the presentation:** Reactive oxygen species in pathogenesis of acute pancreatitis and antioxidative treatment

**Authors:** František Musil (1), Zdeněk Zadák (1), Luboš Sobotka (1), Dagmar Solichová (1), Jan Maňák (1), Milan Kaška (2)

Teaching Hospital, Charles University, Hradec Králové, Department of Gerontology and Metabolic Care (1), Department of Surgery (2)

Objectives: 1. To evidence enhanced activity of reactive oxygen species (ROS) in the course of acute pancreatitis (AP) by evaluation of markers of activity of ROS and antioxidants in blood.

2. To compare dynamic of markers of activity of ROS and dynamic of antioxidants in patients suffering from AP with dynamic of markers of activity of ROS and dynamic of antioxidants in patients with other illness located in abdominal cavity who were admitted to hospital for elective laparotomy.

Results: Blood samples from a group of 17 patients with AP and from a group of 12 patients with other illness in abdominal cavity were analysed on admission, 4th and 8th day of hospitalisation. Blood samples from a group of 12 healthy persons were analysed.

We investigated these parameters: Concentration of selenium in plasma, red cell and big toe nail, concentration of vitamin C, vitamin E, alpha-tocopherol, beta-carotene, vitamin A, conjugated dienes (thiobarbituric acid reactive substances) in plasma, activity of superoxide dismutase and glutathione peroxidase in red cell.

Our preliminary results suggest:

1. Depletion of selenium in patients with AP compared to group of patients with other illness in abdominal cavity and group of healthy persons.

2. Increased consumption of antioxidants in patients in the course of AP and in patients with another illness in abdominal cavity during postoperative period due to increased activity of ROS..

**Address for correspondence:** František Musil, Department of Gerontology and Metabolic Care, Teaching Hospital, Charles University, Sokolská 408, Hradec Králové, 5005

**Title of the research project:** Incorporation of immunohistochemical methods into the routine education of normal histology

**Grant Agency:** Ministry of Education

**Project Number:** 1729/F3/01

**Principal Researcher:** Stanislav Němeček

**Joint Researchers:** Danuše Šubrtová, Jaroslav Mokrý

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 158000

**Summary of 2001 results**

**Title of the presentation:** Incorporation of immunohistochemical methods into the routine education of normal histology

**Authors:** Stanislav Němeček, Danuše Šubrtová, Jaroslav Mokrý

Fac. Med., Charles Univ., Hr. Králové: Dept. of Histology and Embryology

Thanks to new technologies (especially immunohistochemistry), histopathology has become a central part of the practice of clinical medicine. More and more, in vivo diagnosis of disease rests on microscopical examination of small samples of tissue (classical and fine - needle biopsy). It seems evident that the process of pedagogy lags behind the practical use of immunohistochemistry; that must be expressively incorporated into the education of normal histology.

The purpose of this project has been: 1) For practical classes, to supply the students and the staff with slides showing various immunohistochemical detections, accompanied by slides of some special histological technics, as well as corresponding microphotos and legends. Histochemical detections encompass epithelial markers (Cytokeratins, Epithelial membrane antigen), antigens of mesenchymal tissue (Vimentin, S 100 protein, histocytic and endothelial markers), markers of muscle tissue (Desmin), antigens of neural tissue (Synaptophysin, Neurofilaments, Glial-fibrillar acidic protein), endocrine markers (Chromogranin, hormones of all adenohypophyseal cells, Langerhans islet cells, some cells of the diffuse neuro-endocrine system (Somatostatin, Gastrin, Serotonin)), and cellular proliferation marker (PCNA). 2) To show that some classical histological technics are nowadays replaced by the more specific immunohistochemical technics (neurofilaments for neurofibrillar impregnation; glial-fibrillar acidic protein for Cajal's impregnation of astrocytes, etc.). Moreover, immunodetection can better reveal some classical microscopical views (eg. angioarchitecture of the lienal red pulp).

Supported by the Grant Agency of Ministry of Education, No FRVŠ 1729/F3/01

**Address for correspondence:** Stanislav Němeček, Dept. Histol. Embryol., Charles Univ. in Prague, Fac. Med. in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic.

**Title of the research project:** Interaction of 7-methoxytacrine and galanthamine with potential neuroprotective agents

**Grant Agency:** Ministry of Health

**Project Number:** NL/6091

**Principal Researcher:** Vladimír Palička

**Joint Researchers:** Pavel Živný, Jaroslava Vávrová, Josef Herink, Jiří Bajgar, Jaroslav Květina, Zbyněk Svoboda

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1974000

**Summary of 2001 results**

**Title of the presentation:** The effect of L-carnitine pretreatment on acetylcholinesterase inhibition of intracerebroventricularly (i.c.v.) administered 7-methoxytacrine

**Authors:** Vladimír Palička (1), Pavel Živný (1), Jaroslava Vávrová (1), Josef Herink (2), Jiří Bajgar (2), Zbyněk Svoboda (3), Jaroslav Květina (3),

1) Inst. Clin. Biochem. and Diagnostics, University Hospital, Charles University, (2) Dept. Toxicol., Purkyně Medical Academy, (3) Inst. Exp. Biopharm., Academy Sci. and PRO.MED. CS., Hradec Kralove, Czech Republic

Background: Previous results show that L-carnitine (CRT) administered i.p. and 7-methoxytacrine (7-MEOTA) administered i.m. lead to inhibition of brain acetylcholinesterase (ACHE) following CRT pretreatment. It could result either from a change in the blood-brain barrier affected by CRT or from its direct influence on 7-MEOTA inhibition efficacy. The aim of this study was to differentiate these effects using i.c.v. MEOTA administration. Methods: Male Wistar rats were divided into 4 groups: A: i.c.v. administration of saline solution. B: i.c.v. admin. of 0.25 mg 7-MEOTA. C: 3-day admin. of 200 mg/kg i.p. CRT, 30 min. after third CRT inj. i.c.v. 7-MEOTA. D: 3-day admin. of 400mg/kg CRT i.p., 30 min. after third CRT inj. i.c.v. 7-MEOTA. 30 min after last administration the animals were sacrificed, frontal cortex (FC) and basal ganglia (BG) were prepared. ACHE activity in the homogenates was expressed as nmol of acetylthiocholine hydrolyzed/min/100 mg of tissue wet weight. Results are expressed as means, S.E.M are not indicated. ACHE activity in FC was: A: 420.7, B: 377.8, C: 402.6, D: 419.6. ACHE activity in BG was: A: 1460.0, B: 1017.6, C: 1038.1, D: 1045.4. Conclusion: CRT pretreatment leads to higher inhibition of brain ACE by systemic 7-MEOTA administration. When MEOTA was administered i.c.v. after 3 day CRT pretreatment, the inhibition was less expressed in comparison with systemic 7-MEOTA administration.

Supported by grant IGA, Ministry of Health, NL /6091-3

**Address for correspondence:** Vladimír Palička, Institute of Clinical Biochemistry and Diagnostics, University Hospital, Hradec Králové, Czech Republic

**Title of the research project:** Hemostatic changes during radiofrequency catheter ablation

**Grant Agency:** Ministry of Health

**Project Number:** NA 6603-3

**Principal Researcher:** Petr Pařízek

**Joint Researchers:** Jaroslav Malý, Miloslav Pleskot, Martin Hodač, Pravoslav Stránský, Zuzana Škrabková, Miroslav Pecka, Luděk Haman

**Starting date:** 17.7.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1710000

#### **Summary of 2001 results**

**Title of the presentation:** Catheter radiofrequency ablation and hemostatic changes

**Authors:** Petr Pařízek (1), Jaroslav Malý (1), Miloslav Pleskot (2), Martin Hodač (1), Pravoslav Stránský (3), Miroslav Pecka (4), Luděk Haman (4)

Fac.Med., Charles Univ., Hradec Králové: 2<sup>nd</sup> Dept. of Medicine (1), 1<sup>st</sup> Dept. of Medicine (2), Dept. of Medical Biophysics (3), Purkyne Military Medical Academy Hradec Králové (4)

Catheter radiofrequency ablation (RFA) is standard non-pharmacological method in the treatment of cardiac arrhythmias at present. Thromboembolic complications are rare, but serious. Recently published works confirmed activation of hemostatic system during electrophysiologic study and RFA, but mechanisms of thrombogenicity are still unclear. Also there is not any unification in use of antithrombotic therapy for prevention of thromboembolic complications in the connection with RFA.

Authors plan to observe chosen hemostasis activation markers in the group of 100 patients, who are treated with RFA for supraventricular tachycardias (AV nodal reentry, AV reentry and atrial flutter). Blood is taken from catheter in arteria pulmonalis and peripheral vessels before procedure, after diagnostic electrophysiologic study and after RFA. Levels of prothrombotic markers are compared with used procedures parameters.

We included first 20 patients to our study till this time.

Aim of the research study is to contribute to clarification of pathophysiological mechanisms of prothrombotic state during RFA. An acquisition may also be in identification of risk factors of genesis of thromboembolic complications during RFA and in forming of suggestion for preventive antithrombotic arrangements.

Project is supported by the IGA MH CR, No. NA 6603-3/2001.

**Address for correspondence:** P. Pařízek, 2<sup>nd</sup> Dept. of Medicine, Charles University, Faculty Hospital, Hradec Králové, Pospíšilova tř., 500 05, Czech Republic

**Title of the research project:** Reconstruction of the Joint Surface using autologous osteochondral Grafts, autologous cultured Chondrocytes in Suspension and in bioactive Glass-Ceramic Material. An experimental and clinical Study.

**Grant Agency:** Ministry of Health

**Project Number:** ND/6042-3

**Principal Researcher:** Jaroslav Pavlata

**Joint Researchers:** Karel Urban, Pavel Měříčka, Hana Straková, Jindra Brtková

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1184000

#### **Summary of 2001 results**

**Title of the presentation:** Reconstruction of the Joint Surface

**Authors:** Jaroslav Pavlata(1), Karel Urban(2), Karel Karpaš(2), Pavel Měříčka(3), Hana Straková(3), Jindra Brtková(4). Teaching Hosp., Charles Univ., Hradec Králové: Dept.of Orthopaedics(1), Dept.of Tissue Bank(3), Dept.of Radiodiagnostic(4), Fac.Med., Charles Univ., Hradec Králové, Dept.of. Orthopaedics(2).

Treatment of defects of the joint cartilage is a very much of an orthopaedic problem s its quite frequently seen, and when in younger patients all the more important because of arthritic changes occurring at a very young age with very complicated medical treatment programmes plus social and financial implications due to arthritis. The project supposes solution of the treatment of joint cartilage defects by healing through a full-value hyaline cartilage. Recently the new approach to treatment of articular cartilage defects based on use of cultured autologous chondrocytes was introduced to clinical practice. The results of treatment by autologous culture of chondrocytes will be compared with patients who will be treated by the Hangody method in which autologous osteochondral grafts. Results of these two different methods will be compared by a clinical examination, magnetic resonance, control arthroscopy and biopsy. The experimental part of the project - use of bioactive glass-ceramic material as a carrier of autologous cultured chondrocytes - will form the basis for future research aiming to its use in clinical practice. We carried out cultivation of autologous chondrocytes two times. Transplantation of autologous chondrocytes suspension was used in one patient suffering from a femur condyle defect. Transplantation of osteochondral grafts was carried out in three patients. After healing, we did a control arthroscopic examination in 2 patients. The defect was healed by a compact cartilaginous tissue. Bioptic samples were taken from the transplantate in two patients. The microscopic finding consisted of hyaline cartilage (55%) and fibrocartilage (45%). Five Patients were examined with magnetic resonance. Defect was healed cartilaginous tissue.

Project was supported by the Ministry of Health Grant Agency, No ND/6042-3.

**Address for correspondence:** Jaroslav Pavlata, Charles University Teaching Hospital, Dept. of Orthopaedics, 500 05 Hradec Králové, Czech Republic.



**Title of the research project:** Preparation of Digital Videosequences for Cell Biology Practical Classes

**Grant Agency:** Ministry of Education

**Project Number:** 1728/2001/F3

**Principal Researcher:** Jan Peychl

**Joint Researchers:** Emil Rudolf, Miroslav Červinka

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 201000

**Summary of 2001 results**

**Title of the presentation:** Preparation of Digital Videosequences for Cell Biology Practical Classes

**Authors:** Jan Peychl, Emil Rudolf, Miroslav Červinka

Department of Medical Biology and Genetics, Charles University in Prague, Faculty of Medicine in Hradec Králové

Digital imaging is an integral part of contemporary biomedicine, including cell biology. The main goal of our project was to prepare digitized videosequences which will serve as a reference material for demonstrating chosen cell activities during cell biology practical classes at the Department of Medical Biology and Genetics, Charles University in Prague, Faculty of Medicine in Hradec Králové, Czech Republic.

Firstly, we set up a new working place for digitizing videosequences which consisted of: PC - based workstation (Matrox RT200 hardware, Adobe Premiere v. 6.1 software), JVC SVHS videorecorder with time-base correction, TV monitor and UPS.

Next, we recorded the behaviour of cells cultivated in vitro using time-lapse phase-contrast videomicroscopy (microscope OLYMPUS IMT2, analogue JVC videocamera and analogue Mitsubishi time-lapse videorecorder). These analogue videosequences which demonstrated chosen cell activities: cell division, cell movement, cell death (apoptosis) with membrane blebbing, ruffling and phagocytosis of calcium phosphate crystals were digitized, edited and converted to mpeg-1 format. The resulting videostreams were linked to the Department of Medical Biology and Genetics homepage - internet address : <http://biologie.lfhk.cuni.cz> . There they will serve as a teaching material for more than 150 1st year General Medicine and Dentistry students of Charles University, Faculty of Medicine in Hradec Králové, Czech Republic.

Project was supported by the Ministry of Education Grant Agency, No. 1728/2001/F3.

**Address for correspondence:** J. Peychl, Dept. of Medical Biology and Genetics, Charles University in Prague, Fac. of Med. in Hradec Králové, Šimkova 870, 500 01 Hradec Králové

**Title of the research project:** The application of  $^{13}\text{C}$ -breath tests in the pediatric clinical practice.

**Grant Agency:** Ministry of Health

**Project Number:** NE 6164-3

**Principal Researcher:** Oldřich Pozler

**Joint Researchers:** David Neumann, Viktor Voříšek, Jan Bureš, Zdeněk Kokštein, Hubert Vaníček, Petr Dědek

**Starting date:** 1.4.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1917000

#### **Summary of 2001 results**

**Title of the presentation:** The investigation of gastric emptying using  $^{13}\text{C}$ -octanoic acid breath test in the neonates and CF patients.

**Authors:** Oldřich Pozler (1), David Neumann (1), Viktor Voříšek (2), Jan Bureš (3), Josef Bukač (4).

University Hospital Hr. Králové, Fac. Med., Charles University, Hr. Králové: Dept. of Paediatrics (1), Dept. of Clinical Biochemistry and Diagnostics (2), Dept. of Medicine (3), Dept. of Med. Biophysics (4).

The non-invasive  $^{13}\text{C}$ -octanoic acid breath test ( $^{13}\text{C}$ -OABT) is a method for investigating the gastric emptying (GE) rate in adults, children and newborns. The only time-limited step of OA metabolism is GE. Labelling of OA with carbon  $^{13}\text{C}$  stable isotope enables to follow the GE rate, which is reflected by  $^{13}\text{CO}_2/^{12}\text{CO}_2$  ratio change in the expired breath. We hypothesized the GE rate changes according to the amount of enteral nutrition in different groups of prematures. Gastrointestinal motility is widely believed to be disturbed in cystic fibrosis (CF) patients. We monitored gastric motility in CF patients using  $^{13}\text{C}$ -OABT. The original methods were designed: special nasal mask for newborn and infant to the collection of exhaled breath and original software for mathematical analysis of the results was created. Patients: I. 17 stable infants: 31 - 37 week of gestation, 1400 – 2680 g birth weight, 5 small for gestational age, 12 appropriate for gestational age. The postnatal age of infants was 1 – 10 days. There were two pairs of twins in the study. II. 15 children suffered from CF, average age 12.5yrs. Results: I. The personal GE manner of one neonate is stable under circumstances of the same food (pasteurised breast milk) and arising doses of it. The GE half-time computed using AUC was generally statistically insignificant intrapersonally. Small for gestational age prematures, with increasing their milk doses, tend to have higher intraindividual GE half-time variation comparing with appropriate for gestational age infants. There was not any difference in the GE half-time between prematures below 32. w. g. and older ones. The overall half-emptying time of the GE was 46,3 min. II. The GE half-time corresponded to normal value in CF patients. Project is supported by the Ministry of Health Grant Agency, No NE 6164-3.

**Address for correspondence:** O. Pozler, Dept. of Paediatrics, Teaching Hospital, Hradec Králové, 500 05 Hradec Králové, Czech Republic

**Title of the research project:** Introduction and design of the subject Topographic anatomy of head and neck to the dental curriculum

**Grant Agency:** Ministry of Education

**Project Number:** 1727/2001-F3

**Principal Researcher:** Olga Procházková

**Joint Researchers:** Blanka Pospíšilová

**Starting date:** 1.1.2002

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 169000

**Summary of 2001 results**

**Title of the presentation:** Applied anatomy of head and neck - a new subject of the dental curriculum

**Authors:** Olga Procházková, Blanka Pospíšilová

The object of our assignment was to design a curriculum of a new subject - Topographic Anatomy of head and neck - which will be taught in the 3rd year of dentistry studies. First - after consultations with clinicians and using modern teaching methods - the syllabus was established. The new subject was designated APPLIED ANATOMY OF HEAD and NECK. According the project plan, we have obtained appropriate textbooks and literature, teaching models and instruments. With fellow clinicians (dentists, anesthesiologist, dental surgeons, neurosurgeon, ENT specialist and radiologist) 3 teaching video films were produced: Regional anesthesiology in the head and neck, Examination of cranial nerves and Endoscopy of paranasal sinuses. The topic was divided into the six 5 hours lasting teaching modules. Each comprises lectures of a clinician or anatomist, case presentations, demonstrations, training of manual skills and practical classes. The approved list of required manual skills will be a prerequisite for the final examination, together with the essay on a given topic, written by each student individually. Also a spot test for self-assessment was prepared ([www.lfhk.cuni.cz/anatomie](http://www.lfhk.cuni.cz/anatomie)) together with educational CD-ROM, comprising a set of instructive topographic pictures and lectures, especially on pain in the head and neck. A set of final examination questions is a part of curriculum.

Project was supported by the Ministry of Education Grant Agency, No1727/2001- F3.

**Address for correspondence:** O. Procházková, Dept. of Anatomy, Charles University in Prague, Faculty of Medicine in Hradec Králové, 500 01 Czech Republic. [proch@lfhk.cuni.cz](mailto:proch@lfhk.cuni.cz)

**Title of the research project:** Modernization and digitalization of the specimens collection for cellular biology education

**Grant Agency:** Ministry of Education

**Project Number:** 1726/2001/F3

**Principal Researcher:** Emil Rudolf

**Joint Researchers:** Jan Peychl, Miroslav Cervinka

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 184000

**Summary of 2001 results**

**Title of the presentation:** Modernization and digitalization of the specimens collection for cellular biology education

**Authors:** Emil Rudolf, Jan Peychl, Miroslav Cervinka

Fac. Med., Charles Univ., Hr. Králové: Department of Medical biology and genetics

Cellular biology education depends to the large degree on the use of standard microscopes and first-rate collections of specimens. Over the last years, always with generous support of the Grant agency of Ministry of education, we have managed to equip our practical classroom with new student microscopes Nikon SE along with a special teacher's working place including digital camera connected to the Nikon Eclipse E-400 microscope, computer and beamer. The specimens collection we have used so far, on the other hand, has not been upgraded for more than twenty years, and it is therefore not capable to meet the demands of modern trends in biomedical education. To challenge this situation, we set to prepare 21 new specimens, each in 50 copies, and digitalize them simultaneously using digital camera Nikon COOLPIX 950. The specimens comprise mostly different cell lines cultivated in vitro (fixed and stained), but there are also tissues as well as subcellular structures such as chromosomes. The prepared digital microphotographs are being placed onto the departmental homepage: [www.biology-lfhk.cz/](http://www.biology-lfhk.cz/) where they will serve as an education as well as reference material for students and teachers of other subjects where the morphological methods are accentuated too (for example histology and pathologic anatomy). We hope that with this approach we will contribute to further coordination and integration of the individual subjects taught at medical faculties.

Project was supported by the Ministry of Education Grant Agency, No. 1726/2001/F3

**Address for correspondence:** E. Rudolf, Dept. of Medical Biology and Genetics, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové

***Title of the research project:***

Improving the Counseling Services for medical students at the Faculty of Medicine, Charles University in Hradec Kralove

***Grant Agency:*** Ministry of Education***Project Number:*** 1741/E/01***Principal Researcher:*** PhDr. Marie Rybářová***Joint Researchers:*** MUDr. Lubomír Hadaš, MUDr. David Skorunka***Starting date:*** 1.1.2001***Duration (years):*** 1***Funds allocated for project - total in Czech crowns:*** 130***Summary of 2001 results******Title of the presentation:***

Improving the Counseling Services for medical students at the Faculty of Medicine, Charles University in Hradec Kralove

***Authors:*** Marie Rybářová, Fac. Med., Charles Univ., Hradec Králové: Dept. Social. Medicine

Being aware of the importance of student development during the study at a medical faculty we have applied for a grant in order to improve the counseling services at our Faculty of Medicine. Due to the Grant provided we were allowed to purchase recent literature on the subject of counselling as well as psychotherapy. This will obviously improve our understanding of application of different theories in student counseling.

Not only we have improved the actual counselin but we have also started running a voluntary group psychotherapy for students in need. We have also commenced the counseling service for foreign students in the Faculty.

Last but not least, we were enabled to equip the counselling room with new PC as well as with new and comfortable furniture.

Thus we have laid the basis for moderns student counseling service at the Faculty of Medicine, Charles University in Hradec Kralove.

***Address for correspondence:*** M. Rybářová, Dept of Social Medicine, Charles University Faculty of Medicine Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Modernisation of practical classes of medical microbiology - multimedial programmes

**Grant Agency:** Ministry of Education

**Project Number:** 1725/F3/2001

**Principal Researcher:** Olga Ryšková

**Joint Researchers:** Irena Hanovcová, Jiří Horáček

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 152000

**Summary of 2001 results**

**Title of the presentation:** Multimedial programmes in practical classes of medical microbiology on the Faculty of Medicine of Charles University in Hradec Králové

**Authors:** Olga Ryšková, Irena Hanovcová, Lenka Ryšková, Jiří Horáček, Fac. Med., Charles Univ., Hradec Králové, Dept. of Clinical Microbiology

Practical classes of medical microbiology are important part of the study programme on the Faculty of Medicine. The aim of the research project was to use multimedial techniques for an arrangement of some study programmes of practical classes: clinical specimen taking, streptococcal infections, staphylococcal infections, anaerobic infections, diagnosis of viral infections. Prepared study programmes including pictorial documentation (photographs of clinical signs of diseases, microbial cultures, microphotographs, graphs, schemas) were placed on our new web pages and in such a way they are easily reachable for students (<http://www.lfhk.cuni.cz/klinmikrob>). There were added also multichoice tests, used by students for revision of the topics. Results of public inquiry among students show that they prefer electronic forms of lectures and practical classes supplemented by laboratory work. Created web pages concerning the education of microbiology were estimated very positively by students. They consider presented form of education as quantitative and qualitative of knowledge.

Project was supported by the Ministry of Education.

**Address for correspondence:** Olga Ryšková, Fac. Med. Charles Univ., Dept. of Clinical Microbiology, Sokolská 581, 500 05 Hradec Králové,

**Title of the research project:** Introduction of multimedial electronics in tuition of medical physiology

**Grant Agency:** Ministry of Education

**Project Number:** 1722/F3/01

**Principal Researcher:** Václav Šafka.

**Joint Researchers:** Zuzana Červinková, Michaela Adamcová

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 183000

**Summary of 2001 results**

**Title of the presentation:** Introduction of multimedial electronics in tuition of medical physiology

**Authors:** Václav Šafka, Zuzana Červinková, Michaela Adamcová

This project of modernizing theoretical and practical instruction of medical physiology aimed to allow all the teaching staff of our department to use the multimedial electronics to prepare their professional presentations and lectures. Because equipment of our faculty allows to use dataprojection for both lectures and seminars and also practical classes, we needed only the technique accessible to all teacher to process the multimedial data and prepare the presentations. For this purpose, we have got computer of adequate performace together with appropriate input and output devices. Complete system includes: computer with video processing master card and DVD-ROM and CD-RW units, graphic tablet, scanner, videorecorder, digital camera and both black-white laser and color ink-jet printers. This now allows us: digitallization of analogue video and graphic pictures, capturing and recording video in real time, cutting and mixing video and audio recordings of different independent resources, selecting and processing videosequences and even sole snapshots in different formats, creation, processing and archiving graphic and fotodocumentation, creation of graphic figures and charts (even 3D) and animations, and all this to implement into projected presentations or printed publications or to share through the electronic network. We learn to use these new facilities and we hope to have instituted the groundwork for further raise of instructivity and effectivity of tuition of medical physiology utilizing the up-to-date information technology.

**Address for correspondence:** MUDr. Václav Šafka, Ph.D., Dept. of Physiology, Medical Faculty UK, Šimkova 870, 500 01 Hradec Králové, Czech republic; safkavac@lfhk.cuni.cz

**Title of the research project:** Influence of ratio of arterial and portal liver perfusion on insulin resistance and liver function in liver cirrhosis

**Grant Agency:** Czech Republic

**Project Number:** 306/99/P014

**Principal Researcher:** Václav Šafka.

**Joint Researchers:** Zuzana Červinková, Petr Hůlek, Jaroslav Vižďa, Jozefína Dufincová, Tomáš Fejfar

**Starting date:** 1.1.1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 245000

**Summary of 2001 results**

**Title of the presentation:** Influence of ratio of arterial and portal liver perfusion on insulin resistance and liver function in liver cirrhosis

**Authors:** Václav Šafka, Jozefína Dufincová, Tomáš Fejfar, Jaroslav Vižďa, Zuzana Červinková, Petr Hůlek

**PURPOSE:** Liver cirrhosis causes grand changes of liver microcirculation and of its portal and arterial perfusion. This influence the liver unction. Portosystemic shunt further alters these conditions. We measured these liver circulation changes and analyze their relation to liver function and also to insulin resistance which is known to be altered in liver cirrhosis.

**METHODS:** Using a published method of perfusion liver scintigraphy, we applied <sup>99</sup>Tc-DTPA before, 1st day and 7th day after the portosystemic shunt (TIPS) creation. At the same time, we measured insulin resistance using the euglycemic clamp and standard biochemic and cinical data. We have got records of activity course above the liver which we analysed by several described methods.

**RESULTS:** We succeeded to fulfill the consecutive measurements in 23 subjects undergoing elective TIPS. We found individually variable alteration of liver perfusion in liver cirrhosis and variant follow up clinical data. After the portosystemic shunt creation, further dramatic change of the liver perfusion was noted and developed during the following week. We processed the parameters of obtained curves using several different methods described in literature and though there seem to be some tendencies in correlation with the data of clinical outcome, we did not find any statistical significance. Concerning the glucose metabolism, we also did not find a significant change of glucose resistance after the abrupt change of liver perfusion after the shunt creation.

**CONCLUSION:** The changes of glucose metabolism in the liver cirrhosis does not seem to cohere with microcirculation changes. Though liver perfusion changes seemed promising concerning the prognosis of liver function development, using the method of scintigraphic perfusion we did not find an exact parameter to predict it.

**Address for correspondence:** MUDr. Václav Šafka, Ph.D., Dept. of Physiology, Medical Faculty UK, Šimkova 870, 500 01 Hradec Králové, Czech republic; safkavac@lfhk.cuni.cz



**Title of the research project:** Risk perception and level of health self - assessment of employees of different professions

**Grant Agency:** Charles University

**Project Number:** 90/2001

**Principal Researcher:** Jindra Šmejkalová

**Joint Researchers:** Jaroslav Tejral, Lenka Borská, Dana Fialová

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 118.000,-

**Summary of 2001 results**

**Title of the presentation:** Risk perception and level of health self-assessment of employees of different professions.

**Authors:** Jindra Šmejkalová (1), Jaroslav Tejral (1), Lenka Borská (2), Dana Fialová (3).

Fac. Med., Charles Univ., Hr. Králové: Dept. of Hygiene and Preventive Medicine (1), Dept. of Pathological Physiology (2), University Hr. Králové: Dept. of Physical Education and Sports (3)

The aim of our study is to perform anonymous questionnaire inquiry concerning the health risk self-perception of workers in various professions, their knowledge, attitudes and behaviour in essential health questions. During the 3 years we want to contact at least 750 respondents from various professions ("blue-collar" workers, medical workers, teachers of all school levels, representatives of town authorities) chosen in such a manner so that we would be able to evaluate relations between socioeconomic status, educational level, age and gender and health risk perception and knowledge. During the first year of grant solving we have obtained 411 respondents answers (242 from teachers, 124 from medical workers and 45 from factory workers). Preliminary results from those answers of teachers and medical workers show marked risk underestimation in spite of high level of education. In our set 33% of teachers, 28% of nurses and 6% of doctors smoke. The significant differences in participants preventive check-ups were found. The worst situation has been in the group of medical doctors, where 70% of them don't participate in general practitioners (GP) preventive check-ups. 30% of doctors don't participate in stomatological prevention and 1/3 of lady doctors don't participate in preventive gynaecology screening. Situation among medical nurses is a little bit better - on preventive check-ups (in sequence mentioned above) they don't participate in 30, 17 or 19% respectively. The participation in GPs preventive investigations is lowest in the group of teachers as well (only 50%), in stomatological prevention 12% and in gynaecological prevention 14% of investigated teachers do not participate. In the year 2002 we will continue in data-gathering and their statistical analysis. Project was supported by Charles University Grant Agency, No 90/2001.

**Address for correspondence:** Jindra Šmejkalová, Dept. of Hygiene, Charles University in Prague, Faculty of Medicine in Hr. Králové, Šimkova 870, 50001 HK, Czech Republic

**Title of the research project:** The difference between an influence of glutamine and glutamate in parenteral nutrition

**Grant Agency:** Ministry of Health

**Project Number:** NB/6755-2

**Principal Researcher:** Luboš Sobotka

**Joint Researchers:** Zdeněk Zadák, Eduard Havel

**Starting date:** 1.1.上午十二上午十二

**Duration (years):** 2

**Funds allocated for project - total in Czech crowns:** 492000

**Summary of 2001 results**

**Title of the presentation:** The difference between an influence of glutamine and glutamate in parenteral nutrition

**Authors:** Luboš Sobotka, Zdeněk Zadák, Eduard Havel

Faculty Hospital, Charles Univ., Dept. Gerontol. Metabol. Care

The principal goal of this project is to answer the question if the administration of an amino acid solution that contains glutamic acid in quantity equivalent to amount found in standard diet is equally effective as a solution containing glutamine in a form of dipeptide.

Till now eight stable patients whose clinical situation required total parenteral nutrition for more than 14 days (supposed duration of study) were suggested for the study. After information about the purpose of the study they were randomised (method of closed envelopes) to start either with glutamate (regimen 1) or with glutamine (regimen 2), respectively.

After 12 hours of saline administration (equivalent to fasting period) the first blood sample will be withdrawn. Routine laboratory analysis was performed together with measurement of albumin, prealbumin, transferrin and cholinesterase levels in serum. Plasma samples were also deproteinized and frozen -70 deg. C until amino acid analysis.

Then the patients were infused with parenteral nutrition based either on glutamic acid (18 g per day) or glutamate (14 g per day). During infusion and after 12 hours of saline administration blood samples were again withdrawn for biochemical analysis. Then the patient's regimens were changed to the second one and blood samples were collected in the same way as during the first regiment.

The rest of patients (8 subjects), amino acid analysis and statistical evaluation will be done in 2002.

**Address for correspondence:** Luboš Sobotka, Dept. Gerontol. Metabol. Care, Faculty Hospital, Charles Univ., Sokolská 581, 500 05 Hradec Králové, Czech Republic

**Title of the research project:** The importance of lipid metabolism monitoring in aging

**Grant Agency:** Ministry of Health

**Project Number:** NG/6770-3

**Principal Researcher:** Dagmar Solichová

**Joint Researchers:** Vladimír Bláha, Miloš Klejna, Božena Jurašková, Radomír Hyšpler, Petr Žďánský, Zdeněk Zadák

**Starting date:** 1.1.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1200000

#### **Summary of 2001 results**

**Title of the presentation:** Coronary heart disease and lipid risk factors in nonagenarians

**Authors:** Dagmar Solichová, Božena Jurašková, Vladimír Bláha, Marie Kusalová, Radomír Hyšpler, Petr Žďánský, Zdeněk Zadák

Department of Metabolic Care and Gerontology, Teaching Hospital, Hradec Králové

The aim of the present study was the bioanalysis of lipid metabolism in the aged patients with coronary heart disease and to study the relationship between these biochemical markers and longevity.

Twelve nonagenarians, 10 women and 2 men, aged  $94 \pm 3$  years (90-101 years) and eleven control patients, 7 women and 4 men, aged  $84 \pm 5$  years (77-89 years), followed for the coronary artery disease at the Department of Metabolic Care and Gerontology, Charles University, Teaching Hospital entered the study. All subjects were self-sufficient, without any acute major illnesses and free living. At the start of the project the free fatty acids (FFA), thiobarbituric reactive substances (TBARS), retinol, alpha tocopherol, ascorbic acid, cholesterol, triacylglycerols, phospholipids in serum, in lipoprotein fractions and fatty acids (FA) and phospholipids in erythrocyte membrane were determined.

We found significantly higher LDL polyunsaturated fatty acids (PUFA) 18:3n-6 ( $p = 0,022$ ) and 22:6n-3 ( $p = 0,012$ ) and significant increase of HDL alpha tocopherol / cholesterol ratio ( $p = 0,012$ ) in nonagenarians. There were not any significant differences in erythrocyte membrane fatty acids and phospholipids. In serum we found significantly higher levels of TBARS ( $3,23 \pm 1,20$  vs.  $2,12 \pm 0,83$   $\mu\text{mol/l}$ ,  $p = 0,025$ ) and lauric acid ( $p = 0,023$ ) in nonagenarians, other parameters were not changed significantly. We also found significant correlation between dodecahexaenoic acid in LDL and level of TBARS in serum ( $p = 0,024$ ) and HDL alpha tocopherol / cholesterol ratio ( $p = 0,018$ ).

The higher concentrations of PUFAs in LDL and alpha tocopherol in HDL might be parameters related to longevity in nonagenarians with coronary heart disease.

Supported by grants Ministry of Health Czech Republic No. NG/6770-3.

**Address for correspondence:** Dagmar Solichová, Dept. of Metabolic Care and Gerontology, Teaching Hospital, 500 05 Hradec Králové, Czech Republic

**Title of the research project:** Human Brain Project

**Grant Agency:** NIMH, NIDA, NASA (USA)      **Project Number:** R01- 57351

**Principal Researcher:** Kristen M. Harris

**Joint Researchers:** J. Špacek, J. Fiala, M. Feinberg, C. Kim, S. Kirov, D. Selig, K. Sorra

**Starting date:** 1.9.1998

**Duration (years):** 4

**Funds allocated for project - total in Czech crowns:** 180 000

**Summary of 2001 results**

**Title of the presentation:** Human Brain Project

**Authors:** Josef Špaček

The Fingerland Department of Pathology, Charles University Prague, Faculty of Medicine, Hradec Králové

The Human Brain Project is a US Federal research joined by many laboratories. It supports advanced technologies and novel ways to acquire, store, retrieve, analyze, visualize, synthesize, disseminate and share data about the brain.

The Laboratory of Synapse Structure and Function of The Department of Biology, Boston University, developed a software and prepared three-dimensional data available to other brain research laboratories or University centers via the Internet website.

The author supplied the website with The Atlas of Ultrastructural Neurocytology containing more than 400 high quality electron micrographs and three-dimensional reconstructions.

The Atlas as well as other components of the website are widely used as an up-to-date educational sources for students of neurobiology (e.g., in University of Boston, New York, Liverpool, Basel).

The total number of logged accesses (website hits) as revealed by the Microsoft site server express analysis (server statistics) made more than 1.5 million since November 2000, reaching up to more than 2,500 visits per week during the last months. The "Synapse Website" was mentioned by the Science journal, named "Page of the Month" in January 2000 and it received the award for outstanding contribution to Psychology on the Internet.

Reference: <http://synapses.bu.edu/>

**Address for correspondence:** Josef Špacek, The Fingerland Dept. of Pathology, Charles University Hospital, 500 05 Hradec Kralove, Czech Republic

**Title of the research project:** Observation and comparison of biologic and synthetic materials implanted into bone defects

**Grant Agency:** Ministry of Health

**Project Number:** 6853-3/2001

**Principal Researcher:** Pavel Šponer

**Joint Researchers:** Karel Urban, Karel Karpaš, Elen Urbanová

**Starting date:** 17.7.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 913000

**Summary of 2001 results**

**Title of the presentation:** BAS-0 BIOACTIVE GLASS-CERAMIC MATERIAL AS A BONE GRAFT SUBSTITUTE (GROUP OF BONE CYSTS).

**Authors:** Pavel Šponer (1), Elen Urbanová (2), Karel Urban (1), Karel Karpaš (1)

Fac.Med., Charles Univ., Hr.Králové: Dept. of Orthopaedic Surgery (1), Dept. of Nuclear Medicine (2)

**Introduction:** The aim of the study is to assess the long-term results of BAS-0 bioactive glass-ceramic material (LASAK, Prague, Czech Republic) used as a bone tissue substitute in the treatment of bone cysts.

**Materials and methods:** 29 patients were treated by curettage of the bone lesion and filling of the defect with bioactive glass-ceramic material BAS-0 at the Dept. of Orthopaedic Surgery in Hradec Králové between October 1990 and January 2001. Patients with recurrence of bone cyst were excluded and only these following sites of involvement were included in our study: femur in 7 cases, humerus and tibia in 3 cases each. There were 9 men and 3 women and the average age was 14 years (range 8 to 23 years). The primary diagnoses were unicameral bone cyst in 9 patients and aneurysmal bone cyst in 3 patients. The mean follow-up after surgery was 7 years (range 2 to 9 years). At follow-up clinical examination, plain radiographs and bone scintigraphy were performed.

**Results:** No inflammatory changes of soft tissues with normal carrying capacity of the extremity were found in all cases. On plain radiographs no signs of glass-ceramic material loosening and no periosteal reaction were observed. The monitored level of osteoblastic activity of bone tissue in the area of implanted material was normal in 5 cases, increased in 4 cases and high in 3 cases

(all 3 patients were after treatment of bone cyst located in the diaphysis and suffered by pain).

**Conclusions:** By the use of granular form of BAS-0 bioactive glass-ceramic material after bone ingrowth the elastic properties of this filling get near to normal bone tissue. The level of osteoblastic activity in the area of treated bone cyst will be compared with group of patients after filling of the bone defect with bone grafts.

Project was supported by the Ministry of Health Grant Agency, No 6853-3/2001.

**Address for correspondence:** Pavel Šponer, M.D.,

Smetanova 719, 551 01 Jaroměř.



**Title of the research project:**

POSSIBILITY OF USING AND SAFETY OF RADIOACTIVE STENTS, WITH ACTIVITY BROUGHT ABOUT BY CYCLOTRON, IN PREVENTION OF RESTENOSIS

**Grant Agency:** Ministry of Health

**Project Number:** 4786-3/98

**Principal Researcher:** MUDr. Josef Šťásek PhD.

**Joint Researchers:**

MUDr. P. Červinka, MUDr. V. Rozsival CSc, MUDr. Ing. J. Vižďa, MUDr. P. Tilšer, Ing. J. Štursa, Ing. M. Fišer, Ing. V. Koudelka

**Starting date:** 1.1.1998

**Duration (years):** 4

**Funds allocated for project - total in Czech crowns:** 3 279 000,0 Kč

**Summary of 2001 results**

**Title of the presentation:** POSSIBILITY OF USING AND SAFETY OF RADIOACTIVE STENTS, WITH ACTIVITY BROUGHT ABOUT BY CYCLOTRON, IN PREVENTION OF RESTENOSIS

**Authors:** J. Šťásek<sup>1</sup>, P. Červinka<sup>1</sup>, J. Vižďa<sup>1</sup>, P. Vodňanský<sup>1</sup>, M. Fišer<sup>2</sup>, J. Štursa<sup>2</sup>, L. Steinhart<sup>1</sup>, M. Costa<sup>3</sup>, A. Abizaid<sup>3</sup>, M. Pleskot<sup>1</sup>, J. Malý<sup>1</sup>.

Schools of Medicine and University Hospital Hradec Králové, Czech Republic<sup>1</sup>.

Department of Cyclotron, Academy of Science, Czech Republic<sup>2</sup>.

Department of Interventional Cardiology, Sao Paulo, Brazil<sup>3</sup>.

**Background:** The aims of this study were : 1) Prepare of the methodology of an activation of coronary stents in cyclotron. 2) Find out safety of implantation of radioactive stents for patients. 3) Find out if radioactive stents have positive effect to incidence of restenosis after implantation of coronary stents. 4) Find out an effect of radioactive stents on vessel remodeling and plaque formation .

**Methods and Results:** We successfully implanted 14 radioactive stents to 14 patients during of period September 2000 – January 2001. We used 18 mm length BX Velocity stents. The radioactivity of the stents has been brought by the cyclotron in the Department of Cyclotron Academy of Science Czech Republic in Řež. Beta emission (<sup>55</sup>Co) is the dominant source of radiation of the stents. We implanted the stents with mean activity  $41,14 \pm 1,23 \mu\text{C}$  at the time of the implantation. Reference diameter of the treated artery was  $3,049 \pm 0,57$  mm. Minimal lumen diameter increased form  $1,02 \pm 0,47$  mm pre-procedure to  $3,19 \pm 0,62$  mm post procedure . Minimal luminal diameter at follow up average was 1,78 mm and late loss was 1,26 mm.

Angiografic restenosis (> 50%) was observed in 7 patients (50%) . Target lesion revascularization was performed in 5 patients ( 35,7%). We didn't have any subacute or late thrombosis of the stents during the period of follow-up. We didn't observe any death and myocardial infarction during procedure or during follow up.

**Conclusion:** Present type of radioactive stents isn't acceptable for clinical application due to of high incidence of restenosis.

**Address for correspondence:** I. interní klinika FN Hradec Králové, tel. 0602475512





**Title of the research project:** Introduction of methods based on UV-spectrophotometry into biochemical practicals

**Grant Agency:** Ministry of Education

**Project Number:** 1724/2001

**Principal Researcher:** Alena Stoklasová

**Joint Researchers:** Jaroslav Cerman

**Starting date:** 1. 1. 2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 120000

**Summary of 2001 results**

**Title of the presentation:** Introduction of methods based on UV-spectrophotometry into biochemical practicals

**Authors:** Alena Stoklasová, Jaroslav Cerman

Dept. of Medical Biochemistry, Faculty of Medicine, Charles University, Hradec Králové

The aim of this project was to buy an UV-spectrophotometer and introduce a set of enzymic methods based on decrease of absorbance at 340 nm into biochemical practicals. The system lactate dehydrogenase (enzyme) - pyruvate (substrate) - NADH (cosubstrate) was chosen. In this system, pyruvate is reduced to lactate in the presence of NADH and lactate dehydrogenase, which results in a decrease of absorbance at 340 nm. We modified the method to investigate

- the effect of enzyme concentration on the reaction rate,
- the effect of substrate concentration,
- the effect of cosubstrate concentration,
- the effect of temperature,
- the effect of pH.

The determination of aspartate aminotransferase and creatine kinase was also introduced to complete the set of enzymes important in diagnostics of heart infarction.

This project was supported by Ministry of Education - No 1724/2001.

**Address for correspondence:** A. Stoklasová, Dept. of Med. Biochemistry, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové

**Title of the research project:** Innovation of medical biophysics practical education - Basic of Audiometry.

**Grant Agency:** FRVS

**Project Number:** 1723/F3/2001

**Principal Researcher:** Libor Straka, M.D., Ph.D.

**Joint Researchers:** Jiří Záhora, Mgr., Ph.D.

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 186 000

**Summary of 2001 results**

**Title of the presentation:** Innovation of medical biophysics practical education - Basic of Audiometry.

**Authors:** Libor Straka, M.D., Ph.D.

The main goal of project was introduction of new measurement task "Audiometry" into practical training of medical biophysics education. To fulfill this goal we built up audiometric workplace equipped with clinical audiometer DA 65. For practical courses we have prepared complete manuals and documentation concerning the task. Content of task is measurement of threshold audiogram for air and bone conduction and evaluation of hearing loss by Fowler method.

Students meet new task "Audiometry" for the first time in academic year 2001/2002. Success of Audiometry was taken by questionnaire, which students filled after finishing practical training from biophysics. Result of enquiry shows that students appreciate work with technology used in clinical practice, they consider new practical task as suitable and useful.

**Address for correspondence:** libor@lfhk.cuni.cz; Dept. of Medical Biophysics, Charles University, Faculty of Medicine, Simkova 870, 500 02 Hradec Kralove, Czech Republic

**Title of the research project:** The development of software for processing of medical information and biosignal supporting improvement of and for quality of education

**Grant Agency:** Ministry of Education

**Project Number:** 111500004

**Principal Researcher:** Pravoslav Stránský

**Joint Researchers:** Miroslav Červinka, Josef Hanuš, Nad'a Jirásková, Miroslav Kuba, Jan Kremláček, Iva Krulichová, Vladimír Mašín, Emil Rudolf, Jindra Šmejkalová, Jaroslav Tejral, Vlasta Tošnerová

**Starting date:** 1.1.1999

**Duration (years):** 5

**Funds allocated for project - total in Czech crowns:** 1846000

#### **Summary of 2001 results**

**Title of the presentation:** Development of the databases and software for biosignals analysis and improvement of quality education.

**Authors:** Pravoslav Stránský, Josef Hanuš, Vladimír Mašín, Iva Krulichová  
Fac. Med., Charles Univ., Hr. Králové: Dept. Biophysics

In correspondence with the proposal (see <http://camelot.lfhk.cuni.cz/fyzika/> reference Granty) the third year activity was concentrated on

- 1) the development of the applications of programs for analysis of mechanical properties of tissues and materials for bioimplants,
- 2) the analysis of motion-onset visual evoked potentials connected with sensory information processing and mechanism of non-specific adaptation,
- 3) the analysis of cataract surgery with capsular tension ring and traumatic cataracts in children and refractive lensectomy,
- 4) the development of the hypertext program for undergraduate students in fields of biostatistics, pharmacotherapy training and case studies in hygiene
- 5) 3D database for the reconstruction of apoptotic nuclei,
- 6) the writing the software for transfer and storing of data from stabilographic plane and statokinesiometric examinations.

For backup and support of the above-mentioned goals new hardware was purchased: 4 notebooks, 2 servers, 4 personal computers, ISES measuring system and 2 digital cameras. Software paid from the allocated funds included renewal of STATISTICA v.6, MATHLAB licenses and new LabView program.

**Address for correspondence:** Pravoslav Stránský, Dept. of Medical Biophysics, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01, Hradec Králové 1, Czech Republic

**Title of the research project:** Photopic electroretinography in diabetics

**Grant Agency:** Ministry of Health

**Project Number:** NK/6835

**Principal Researcher:** Jaromír Svěrák

**Joint Researchers:** Jaroslav Peregrin, Eva Rencová, Hana Langrová, Josef Kvasnička, Hana Dvořáková

**Starting date:** 01.01.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 106000

**Summary of 2001 results**

**Title of the presentation:** Photopic electroretinography in diabetics

**Authors:** Jaromír Svěrák, Jaroslav Peregrin, Eva Rencová, Josef Kvasnička, Hana Langrová, Hana Dvořáková

Charles University in Prague, Faculty of Medicine in Hradec Králové, Dept. of Ophthalmology

The importance of the scotopic electroretinography (ERG) for diagnosis and prognosis of the diabetic retinopathy is doubtless. The aim of this study is to detect abnormalities of the photopic ERG in diabetics.

The ERG examinations of three groups of diabetics were continued: 1. diabetics without diabetic retinopathy (n=38), 2. diabetics with simple diabetic retinopathy (n=24), 3. diabetics with preproliferative and proliferative diabetic retinopathy before and after panretinal photocoagulation (n=20). Besides the rod and the maximal ERG responses, the photopic ERG responses were evaluated. The abnormalities of the photopic responses were confirmed, the manuscript is in a preparation. In the clinical electroretinography, the subnormal oscillatory potentials were found in patients with the optic nerve pits complicated by the maculopathy. It will be the first description of such finding in the literature. The ERG potentials were examined in 40 patients with stenosis of the carotid artery. The possible dependence of the ERG potentials on the laterality of the carotid artery stenosis was proved and the extent of the ERG changes in bilateral carotid artery stenosis was tested. The interesting ERG findings in 5 patients with the congenital stationary night blindness are supposed to enable more precise evaluation of the cone's contribution to the size of the oscillatory potentials and the efficient power. The spectrum of the examinational methods was enlarged. The examination with the 15 Hz flicker stimulus was introduced. Eleven gelatine neutral gray filters which enable to change the intensity of the illumination in smaller steps (Nd1 – Nd2) were provided.

**Address for correspondence:** Prof. MUDr. Jaromír Svěrák, DrSc., Charles University, Dept. Ophthalmology, Sokolská 158, 500 05 Hradec Králové, e-mail: sverak@fnhk.cz.

**Title of the research project:** Use of Videorecords in Preventive Medicine Education

**Grant Agency:** FRVŠ

**Project Number:** 1721/2001/F3

**Principal Researcher:** Jaroslav Tejral

**Joint Researchers:** Jindra Šmejkalová, Zdeněk Fiala

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 103000

**Summary of 2001 results**

**Title of the presentation:** Use of Videorecords in Preventive Medicine Education

**Authors:** Jaroslav Tejral (1), Jindra Šmejkalová (1), Zdeněk Fiala (1)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Hygiene and Preventive Medicine (1)

To obtain a good quality of medical care in preventive medicine there is necessary to teach medical students basic information concerning all possible aspects of occupational environment. Till recent times we have been using the field visits into various enterprices. Such an educational approach was laden with specific risks. They were time-consuming and there existed the danger of possible injuries and poor oral communication in noisy environment. That's why we looked for the finantiad support from the grant system and we succeeded in getting the TV set with a big screen, a videorecorder and a moovie camera. This technique at disposal can be used for videorecording the chosen activities in various professions. In the year 2001 we recorded 17 video shots of our own production and moreover obtained 7 professional videorecords. These videoshots have already been used during pedagogic activity of ours in this school year. These visual aids make lectures/seminars more interesting and increase active participation of students. Project was supported by FRVŠ Grant Agency, No. 1721/2001/F3.

**Address for correspondence:** Jaroslav Tejral, Dept. of Hygiene, Charles University in Prague, Faculty of Medicine in Hr. Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Standardisation of tests on force platform as objective method of movement system

**Grant Agency:** Ministry of Health

**Project Number:** 6078-3/2000

**Principal Researcher:** Vlasta Tosnerova

**Joint Researchers:** Libor Straka, Eva Vanaskova, Zdenek Milacek

**Starting date:** 1.1.2000

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 159

**Summary of 2001 results**

**Title of the presentation:** Standardisation of clinical tests on force platform

**Authors:** Vlasta Tosnerova (1), Libor Straka (2), Zdenek Milacek (3)

Charles Univ. Prague, Fac. Med., Hr.Kralove, Dept.Rehabil. (1), Dept. Med. of Biophys. (2), Dept.Rehab (3)

Upright posture in humans represents maintaining equilibrium between various disturbances and contractions of musculature resulting in continuous body-sway. The body-sway measurement is usually accomplished by evaluation of the trajectory of the center of pressure (CP) of the vertical foot-ground reaction forces by using a force platform (FP) equipped with strain gauge sensors. The trajectory of the CP is related to the asymmetry of the contact area of the feet with ground, i.e. between the length and the width of both feet. It also is corresponding to the form projection the center of gravity. Sway of 50 healthy persons (20 males, 30 females), aged 18-27 years, all students of two Universities in Hradec Kralove were examined. Their overall body status (fitness) was evaluated before FP investigation (e. g. body symmetry, muscle development, medical history etc.) Swaying in a 20s both described time interval: i/ 2D trajectory of the CP and ii/ X- and Y- components of the CP deflection in time, resembling a time series. Pilot results represented by grand average component range in both groups show no significance. In second year statistics was extended also recording data from different tests. There was confirmed by statistics that 50 young individuals can be used as standard for comparisons. We continued to evaluate aging people. We investigated 7 individuals 30-49 year old and 10 individuals 50 and older to compare statistics from elderly and younger people to have standards for aging population.

Literature: Benda,B.,J., Riely, P.O., Krebs, D.E.: Biomechanical relationship between center of pressure during standing. IEEE. Trans Rehab Eng 1994;2:13-25

**Address for correspondence:** V. Tosnerova, Dept. of Rehabilitation, Charles University in Prague, Fac. of Medicine in Hradec Kralove, Nezvalova 956, Hradec Kralove, Czech Rep.

**Title of the research project:** Phenotype and function of tumor infiltrating lymphocytes in ovarian cancer patients

**Grant Agency:** Ministry of Health

**Project Number:** 5196-3

**Principal Researcher:** Miroslava Toušková, M.S.

**Joint Researchers:** Bohuslav Melichar, M.D., Ph.D., Jindřich Tošner M.D., Ph.D., Jan Krejsek, Ph.D., Otakar Kopecký, M.D., Ph.D.

**Starting date:** 1.1.1999

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1200000

**Summary of 2001 results**

**Title of the presentation:** Malignant ascites as a model to study the host-tumor relation

**Authors:** Bohuslav Melichar (1), Miroslava Toušková (2), Jindřich Tošner (3) Dept. 1 Oncology&Radiotherapy, 2 Immunology & 3 Gynecology/Obstetrics, Charles Univ. Med. School Teaching Hosp., Hradec Králové

Metastatic involvement of the peritoneum is the dominant form of metastatic spread in epithelial ovarian carcinoma, and is frequently accompanied by the formation of ascites. Ascitic fluid presents with an opportunity to study the cellular populations in the peritoneal cavity and the tumor microenvironment (1). Activation of the population of leukocytes resident in the peritoneal cavity by biologic agents also represents one of the approaches to improve the cure rate in ovarian cancer patients with peritoneal carcinomatosis. Along with tumor cells and mesothelial cells, all major leukocyte populations are represented in the malignant ascites. Lymphocytes isolated from the malignant ascites are frequently called tumor infiltrating lymphocytes (TIL). Most of the TIL are T-cells. We found that the percentage of NK cells in the peritoneal cavity is similar to the values reported for peripheral blood of cancer patients. Interestingly, the percentage of NK cells has been found to be elevated in ascitic fluid of patients with liver metastases (2). B-lymphocytes are represented in a smaller portion than in peripheral blood. Monocytes/macrophages represent a major, sometimes predominant population of leukocytes in malignant ascites. The presence of all 5 monocyte populations defined in the peripheral blood of normal subjects by the expression of CD14, CD16 and CD56 was evident in the malignant ascites. Significant cytotoxic and cytostatic activity could be elicited by treating ascitic monocytes with interferon-gamma or interleukin-2.

References: 1. Melichar B, Freedman RS. Immunology of the peritoneal cavity: Relevance for host-tumor relation. Int J Gynecol Cancer 2002, in press 2. Melichar B, Toušková M, Tošner J, Kopecký O. The phenotype of ascitic fluid lymphocytes in patients with ovarian carcinoma and other primaries. Onkologie 2001; 24 :156 - 160.

**Address for correspondence:** Bohuslav Melichar, M.D., Ph.D. Department of Oncology& Radiotherapy, Charles Univ. Med. School Teaching Hospital, Hradec Králové, Czech Rep.

**Title of the research project:** Therapeutic impact on the cognitive functions in schizophrenia

**Grant Agency:** Ministry of Health

**Project Number:** NF67533/2001

**Principal Researcher:** MUDr. Ivan Tůma, CSc.

**Joint Researchers:** MUDr. Mgr. Marek Pérez

**Starting date:** 17.7.2001

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 1951000

**Summary of 2001 results**

**Title of the presentation:** Therapeutic impact on the cognitive functions in schizophrenia

**Authors:** Ivan Tůma Charles University in Prague, School of Medicine and Teaching Hospital in Hradec Králové, Dept of Psychiatry, 500 05, Czech republic

Schizophrenia is, to variable degrees, accompanied by a broad spectrum of cognitive impairments. Numerous reports document lower premorbid IQ scores, impairments of psychomotor development, and premorbid speech abnormalities in children who later developed schizophrenia. These findings suggest that early developmental anomalies might be responsible for cognitive impairment observed in schizophrenic patients. Considerable evidence now points towards cognitive deficits as an enduring trait of schizophrenia. Poor cognitive function is a major factor interfering with patients' social and occupational functioning. The key domains of cognitive dysfunction are memory, attention and executive functions impairments. Novel antipsychotics such as risperidone may help optimise treatment and long-term functional outcome. Considerable evidence exists suggesting an important role for cholinergic neurotransmission in various aspect of learning and memory. The aim of this project is to evaluate the effectiveness of combination of risperidone and cholinergic drug donepezil on cognitive functions in double blind placebo controlled study in schizophrenic patients. The first four patients have entered the study between October and December 2001.

**Address for correspondence:** Ivan Tůma Charles University in Prague, School of Medicine and Teaching Hospital in Hradec Králové, Dept of Psychiatry, 500 05, Czech republic



**Title of the research project:** Impression taking by reversible hydrocolloids /agar-agar/

**Grant Agency:** Ministry of Education

**Project Number:** 1730/F3/01

**Principal Researcher:** Dagmar Vahalová

**Joint Researchers:** Jiří Bittner, Dita Dufková - Brázdová

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 160000

**Summary of 2001 results**

**Title of the presentation:** Impression taking by reversible hydrocolloids /agar-agar/

**Authors:** Dagmar Vahalová, Jiří Bittner, Dita Dufková-Brázdová

Fac. med., Charles Univ., Hradec Králové: Dept. of Dentistry

The device allowing the impression taking of the prepared teeth in fixed prosthodontics by the reversible hydrocolloid impression materials was bought. This apparatus is installed at the prosthetic department of the dental clinic and it is used in both the preclinical and clinical dental prosthetic instruction. We are able to demonstrate the impression material and technique, which were discussed only theoretically as yet. The reversible hydrocolloid agar-agar is the natural hydrophilic impression material setting due to the physical process during cooling practically without the dimensional changes. The hydrophilic properties are very important in the fixed prosthodontics assuring the reproduction of the preparation details placed in the wet gingival crevice. Materials being at our disposal as yet, are non-hydrophilic. Hydrocolloid materials are supplied by manufacturers in the set gelatinous state in the collapsible plastic tubes or small glass cylinders. They are liquified during the 10 min. lasting immersion in the boiling water bath in the first compartment of the purchased apparatus named as hydroprocessor. The material in the sol state can be stored for 5 days in the second compartment of the hydroprocessor- in the storing water bath. Immediately before the impression the material placed in the specialized impression tray is tempered to the temperature of 45 Celsius degrees at which the material remains still in the sol state being suitable for the impression taking. Introduction of this impression material and technique contributes both to the enlargement of the treatment methods in the prosthetic dentistry and to the enrichment of the dental instruction.

Project was supported by the Ministry of Education Grant Agency, No.1730/F3/01

**Address for correspondence:** D. Vahalová, Dept. of dentistry, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Republic

**Title of the research project:** Chantes of lipid metabolism and its mediator-related effects in patients with colorectal carcinoma - prospective impact in nutritional support.

**Grant Agency:** Ministry of Health

**Project Number:** NC/6171-3

**Principal Researcher:** Zdeněk Zadák

**Joint Researchers:** Petr Žďánský, Bohuslav Melichar, Pavel Jandík, Dagmar Solichová, Vladimír Bláha

**Starting date:** 1.1.上午十二上午十二

**Duration (years):** 3

**Funds allocated for project - total in Czech crowns:** 370000

**Summary of 2001 results**

**Title of the presentation:** see above

**Authors:** see above

Lipids are the most important substrates for energy production, components of cellular membranes and metabolic mediators ( polyunsaturated fatty acids, precursors of cholesterol biosynthesis etc.). In addition short chain fatty acids are important metabolites as energy fuel for colonocytes.

Research project is composed from three parts :

1/ In experimental section was studied effect of selective inhibitors on enzymatic cascade in production of arachidonic acid metabolites and in the second step interaction of this products with TNF-alfa. This experiments demonstrated increased sensitivity of tumor cells

( colon cancer cells HT- 29 ) to apoptosis after polyunsaturated fatty acid treatment.

2/ The clinical section is focused on the development of method applicable for monitoring of SCFA ( short chain fatty acid ) production. Method based on the methane analysis in the breath enables to determine value of dietetic fibres in nutritional manipulations. The new method based on the breath analysis has been successfully accomplished , practical clinical application proved and patent recently prepared .

3/ Precursors of cholesterol biosynthesis represents group of compounds important in the composition and function of cellular membrane. Isoprenoids, mevalonic acid and squalene are precursors of ubiquinones, and anchoring molecules for Ras proteins. Cholesterol biosynthesis precursors were determined by GCMS method in colon cancer patients and in control group and results are prepared for publication

Some methodologies or results of pilot studies were accepted for publication or already published (example):

European Journal of Cancer 36: 1844-1852 (2000): TNF modulates differentiation induced by butyrate in the HT-29 human colon adenocarcinoma cell line.

***Address for correspondence:*** Zdeněk Zadák, Dept. of Metabolic Care and Gerontology,  
Teaching Hospital, 500 05 Hradec Králové, Czech Republic

**Title of the research project:**

Analysis of expired gases using GC/MS for observation of metabolic disorders-cooperative project of three faculties

**Grant Agency:** Czech Republic**Project Number:** 203/99/1165**Principal Researcher:** Prof. Ing. Jiří Gasparič, DrSc.

Faculty of Pharmacy, Charles University, Heyrovského 1203, Hradec Králové 5, 500 05

**Joint Researchers:**

Prof. MUDr. Zdeněk Zadák, CSc,

Medical Faculty, Šimkova 870, Hradec Králové, 500 02

Prof. Ing. Karel Kolář, CSc.

Teachers' Training University, Víta Nejedlého 573, Hradec Králové, 500 03

**Starting date:** 1.1.1999**Duration (years):** 3**Funds allocated for project - total in Czech crowns:** 989000**Summary of 2001 results****Title of the presentation:**

Analysis of expired gases using GC/MS for observation of metabolic disorders

**Authors:** Zadák Z., Hyšpler, R., Tichá, A., Indrová, M.

The aim of this project was a development and elaboration of sampling and analytical methods for determination of cholesterol precursors and intestinal anaerobic fermentation product with an emphasis on expired gas analysis. The sampling and analytical methods for the determination of isoprene (Solid Phase Microextraction-GC-MS) and methane (GC-FID) in expired breath were developed. As a reference parameter of cholesterol synthesis, the analytical method for determination of cholesterol precursors (squalene, lanosterole, lathosterole) and phytosterols (sitosterole, campesterole, stigmasterole) in blood plasma. The method for determination of hydrogen sulphide concentration in whole blood (extractive alkylation and GC-MS). Expired breath is not suitable sampling material due to the interference of dental plaque bacteria.

Successful project realisation was facilitated by close cooperation of regional universities. Developed methods are used in medical research of metabolic disorders and processes accompanying critical care. The analytical methods and their clinical application were published in impacted journals and presented at international conferences.

**Publications:**

Hyšpler R., Crhová Š., Gasparič J., Zadák Z., Čížková M., Balasová V., J. of Chromatography B. 739, 183-190, 2000, ISSN 0378-4347.

Hyšpler, R., Tichá, A., Indrová, M., Zadák, Z., Hyšplerová, L., Gasparič, J., Churáček, J., Journal of Chromatography B, accepted for publication, in press.

Zadák Z., Hyšpler R., Bakalář B., Crhová Š., Vnitřní lékařství, 46 (11), 2000, 779-781, ISSN 0042-773X.

Zadák, Z., Hyšpler, R., Bakalář, B., Crhová, Š., Sobotka, L., Tichá, A., Indrová, M., Bláha, V., Clinical Nutrition 20(Supplement 3), 2001, ISSN 0261-5614.

**Address for correspondence:** Prof. MUDr. Zdeněk Zadák, CSc., Department of Metabolic Care and Gerontology, Teaching Hospital, Sokolská 581, Hradec Králové, 500 05



**Title of the research project:** The relation between selected biochemical parameters in cadaveric kidney donors and post-transplantation graft function

**Grant Agency:** Ministry of Education

**Project Number:** 1720/G3

**Principal Researcher:** Helena Živná

**Joint Researchers:** Ondřej Pavlínek

**Starting date:** 1.1.2001

**Duration (years):** 1

**Funds allocated for project - total in Czech crowns:** 63000

**Summary of 2001 results**

**Title of the presentation:** The relation between selected biochemical parameters in cadaveric kidney donors and post-transplantation graft function

**Authors:** Helena Živná (1), Ondřej Pavlínek (2)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Physiology (1), student of Fac. Med., Charles Univ., Hr. Králové (2)

The aim of study was to assess the relationship between plasma selenium concentration in cadaveric kidney donors and graft function in recipients in early stage after transplantation. Patients and methods: The study protocol was approved by local ethical committee. Plasma selenium concentrations (Se,  $\mu\text{mol/l}$ ) were measured in cadaveric kidney donors at the time of brain death diagnosis established by brain angiography. The markers of graft functioning in recipients were observed during 5 days period after transplantation.

Results: Grafts with worse function were from these donors: women (Se - 0.74 v.s. men 0.59), time period between insult and death longer than 48 h (Se - 0.67 v.s. shorter 0.59), hemoglobine concentrations higher than 120 g/l (Se - 0.72 v.s. lower 0.52), no treatment with desmopressini acetat (Se - 0.68 v.s. desmopressini acetat treatment 0.57). Higher plasma selenium concentrations were the common sign of all these donors. Grafts with signs of good function: early decrease of serum urea ( $\text{mmol/l}$  - 10.3 v.s. worse function 34.0), creatinine ( $\mu\text{mol/l}$  - 175 v.s. worse function 562) and rapid increase of creatinine clearance ( $\text{ml/s}$  - 0.84 v.s. worse function 0.20) were from donors with lower plasma selenium concentrations.

Conclusion. We assume that higher plasma selenium concentration is the result of reduced ability of cells to utilize this trace element for antioxidant defence reactions. There is higher risk of reactive oxygen species formation, which impaired kidney and make worse graft for future transplantation. These our results suggest that desmopressini acetat treatment of donors was linked with lower plasma selenium concentration in donors and with better early post-transplantation graft function in recipients.

Supported by grant of Ministry of Education No. 1720/G3

**Address for correspondence:** Helena Živná, Fac. Med., Charles Univ., Dept. of Physiology, Šimkova 870, Hradec Králové