

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

VII. VĚDECKÁ KONFERENCE

P R O G R A M



22. ledna 2003

**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 v Praze

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 22. 1. 2003

- 14.00 - 14.15 **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: prof. MUDr. Pavel Rozsival, CSc.**
- 14.15 - 14.30 Nové látky chelatující železo – problematika jejich
kardiovaskulárních, potenciálně kardioprotektivních a
biotransformačních účinků
doc. MUDr. Vladimír Geršl, CSc.
GA ČR 305/00/0365 (LF)
- 14.30 - 14.45 Charakteristika diferenciačního potenciálu neurálních kmenových
buněk
doc. MUDr. Jaroslav Mokrý, Ph.D.
GA ČR 304/00/0338 (LF)
- 14.45 - 15.00 Přínos stanovení dipeptidylpeptidázy IV (DPP IV) v diferenciační
diagnostice tumorů štítné žlázy
MUDr. Ivana Kholová
GA UK 87/00 (LF)
- 15.00 - 15.15 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)
- 15.15 - 15.30 Adenomy hypofýzy kultivované in vitro: vliv somatostatinových
analogů a induktorů apoptózy
MUDr. Jan Čáp, CSc.
IGA MZ ČR NB/6172-3 (LF)
- 15.30 - 15.45 Význam efektivní atriální kontrakce pro sekvenční stimulaci
prof. MUDr. Jiří Kvasnička, CSc.
IGA MZ ČR NA/5403-3 (LF)
- 15.45 - 16.00 Aktivní formy kyslíku v patogenezi akutní pankreatitidy a možnost
ovlivnění antioxidanty
MUDr. František Musil
IGA MZ ČR NB/6043-3 (FN)
- 16.00 - 16.15 ***P ř e s t á v k a - občerstvení, prohlídka plakátových sdělení***

Sekce II

Předsedající: doc. RNDr. Jan Krejsek, CSc.

- 16.15 - 16.30 Interakce 7-methoxytarcinu a galanthaminu s vybranými neuroprotektivy
prof. MUDr. Vladimír Palička, CSc.
IGA MZ ČR NL/6091-3 (FN)
- 16.30 - 16.45 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)
- 16.45 - 17.00 Aplikace 13C dechových testů do klinické praxe v pediatrii
doc. MUDr. Oldřich Pozler, CSc.
IGA MZ ČR NE/6164-3 (LF)
- 17.00 - 17.15 Porovnání vlivu glutaminu a kyseliny glutamové během parenterální výživy
doc. MUDr. Luboš Sobotka, CSc.
IGA MZ ČR NB/6755-2 (LF)
- 17.15 - 17.30 Standardizace vyšetřovacích metod na stabilografické plošině za účelem objektivizace změn pohybového ústrojí
MUDr. Vlasta Tošnerová, CSc.
IGA MZ ČR NK/6078-3 (LF)
- 17.30 - 17.45 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)
- 17.45 - 18.00 ***P ř e s t á v k a - občerstvení, prohlídka plakátových sdělení***

U k o n č e 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)
9. - 10. 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)

PROJEKTY PREZENTOVANÉ FORMOU PLAKÁTOVÝCH SDĚLENÍ

11. Adenomy hypofýzy kultivované in vitro: vliv somatostatinových analogů a induktorů apoptózy
MUDr. Jan Čáp, CSc.
IGA MZ ČR NB/6172-3 (LF)
12. 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)
13. Screening a diagnostika dědičných poruch glykosylace
MUDr. Eliška Marklová, CSc.
GA UK 85/01 (LF)
14. „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)

**NA LF UK A VE FN V HRADCI KRÁLOVÉ SE V ROCE 2002 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. Zobrazovací systém ve výuce hematologie a imunologie
MUDr. Michaela Adamcová, CSc.
FRVŠ 2509 (LF)
2. Studium změn regulačních proteinů myokardu za různých patologických stavů
MUDr. Michaela Adamcová, Ph.D.
GA UK 81/02 (LF)
3. Zvýšení kvality preklinické výuky stomatologie ve fantomové laboratoři
MUDr. Petr Bednář
FRVŠ 2510 (LF)
4. Úloha metabolické, endoteliální a trombocytární dysfunkce v procesu atherogenesy
prof. MUDr. Milan Bláha, CSc.
IGA MZ ČR NB/6549-3 (FN)
5. Predikace, optimalizace a individualizace výsledku léčebné procedury při LDL-aféřeze - multivariantní model v prospektivní studii
prof. MUDr. Milan Bláha, CSc.
IGA MZ ČR NB/7006-3 (FN)
6. 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)
7. Aterogenní potenciál poruch metabolismu mastných kyselin a cholesterolu v procesu koronární atherogeneze u diabetu mellitu II. typu
doc. MUDr. Vladimír Bláha, CSc.
IGA MZ ČR NB/6999-3 (FN)
8. Užití nízkomolekulárního heparinu během perkutánní transluminální koronární angioplastiky (PTCA)
MUDr. Miroslav Brtko
IGA MZ ČR NA/6579-3 (FN)

9. Podrobné hodnocení zrakových funkcí u fakických čoček
MUDr. Lisa Catherine Bytton
FRVŠ 2523 (LF)
10. 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)
11. Stanovení koncentrace a čistoty DNA – zavedení úlohy do praktik z biologie
prof. MUDr. RNDr. Miroslav Červinka, CSc.
FRVŠ 2519 (LF)
12. Inovace praktické výuky fyziologie na Lékařské fakultě UK v Hradci Králové
doc. MUDr. Zuzana Červinková, CSc.
FRVŠ 2528 (LF)
13. Základy klinické mikrobiologie – multimediální učební text
RNDr. Irena Hanovcová, CSc.
FRVŠ 2531 (LF)
14. Zobrazovací metody využívající ionizující záření, princip CT
doc. Ing. Josef Hanuš, CSc.
FRVŠ 2512 (LF)
15. Inovace praktické výuky oftalmologie – vyšetření na štěrbinové lampě
doc. MUDr. Dagmar Hejmanová, CSc.
FRVŠ 2513 (LF)
16. Vliv acidózy na metabolismus proteinů a aminokyselin
doc. MUDr. Milan Holeček, DrSc.
GA ČR 305/01/0578 (LF)
17. Vliv aminokyselin a hormonů na metabolismus proteinů u katabolických stavů
doc. MUDr. Milan Holeček, DrSc.
IGA MZ ČR NB/6793-3 (LF)
18. 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)

19. Stanovení isoprenu ve vydechovaném vzduchu - interpretace vyšetření a zavedení do klinického výzkumu poruch metabolismu cholesterolu
MUDr. Radomír Hyšpler, Ph.D.
GA ČR 203/01/P110 (LF)
20. Biochemické markery zánětu ve vydechovaném vzduchu u dětských astmatiků jako nová metoda sledování kontroly astmatu a prostředek pro optimalizaci farmakoterapie
Ing. Jaroslav Chládek, Ph.D.
IGA MZ NL/7024-3/02 (LF)
21. Interaktivní programy pro výuku farmakologie
Mgr. Iva Krulichová
FRVŠ 2533 (LF)
22. Elektrofyzilogické hodnocení věkově závislých změn zrakového vnímání člověka
doc. MUDr. Miroslav Kuba, CSc.
GA ČR 309/02/1134 (LF)
23. 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)
24. Vliv transparence nitrooční čočky na rozlišovací schopnost oka
MUDr. Hana Langrová, Ph.D.
GA ČR 309/00/D056 (LF)
25. Výuka oftalmologie na Lékařské fakultě Univerzity Tuebingen - SRN
MUDr. Hana Langrová, Ph.D.
FRVŠ 2534 (LF)
26. Modernizace výuky fyziologie dýchacího ústrojí
MUDr. Halka Lotková, Ph.D.
FRVŠ 2515 (LF)
27. Sociální opora u dětí a dospívajících v psychicky náročných situacích
prof. PhDr. Jiří Mareš, CSc.
GA ČR 406/01/0659 (LF)
28. Populační modelování farmakokinetiky a farmakodynamiky v klinické farmakologii
prof. MUDr. Jiřina Martínková, CSc.
COST OC B15.10 (LF)

29. Metody predikce lékových interakcí na úrovni metabolismu s využitím metod in vitro
prof. MUDr. Jiřina Martínková, CSc.
COST OC B15.30 (LF)
30. Inovace a doplnění výukových textů farmakologie
MUDr. Stanislav Mičuda, Ph.D.
FRVŠ 2516 (LF)
31. Hodnocení změn exprese MRP2 na kanalikulární membráně hepatocytů a jejich vlivu na jaterní eliminaci metotrexatu
MUDr. Stanislav Mičuda, Ph.D.
GA UK 89/02 (LF)
32. Zavedení a využití systémů kultivace lidských hepatocytů pro hodnocení metabolismu léků in vitro.
doc. MUDr. Jaroslav Mokrý, Ph.D.
COST OC B15.40 (LF)
33. Imunohistochemická detekce nestinu jakožto diagnostického markeru v patomorfologii
doc. MUDr. Jaroslav Mokrý, Ph.D.
IGA MZ ČR NK/6727-3 (LF)
34. Inovace okruhů lymfatický systém a hemopoéza
doc. MUDr. Jaroslav Mokrý, Ph.D.
FRVŠ 2517 (LF)
35. Změny hemostázy při katetrizační radiofrekvenční ablaci
MUDr. Petr Pařízek
IGA MZ ČR NA/6603-3 (LF)
36. Sledování kvality péče o nemocné s mimonemocniční oběhovou zástavou ve východočeském regionu
doc. MUDr. Miloslav Pleskot, CSc.
IGA MZ ČR NA/7254-3 (FN)
37. Multimediální výukový atlas aplikované osteologie na www
MUDr. Blanka Pospíšilová, CSc.
FRVŠ 2532 (LF)
38. Glutaminem suplementovaná parenterální výživa při transplantaci periferních kmenových buněk u hematologických malignit
MUDr. Alice Poznarová
IGA MZ ČR NA/7000-2 (FN)

39. Telepatologie a její uplatnění v bioptické diagnostice
MUDr. Aleš Ryška, Ph.D.
FRVŠ 2520 (LF)
40. Magnetická rezonance versus thaliová scintigrafie v detekci viabilního myokardu.
Prospektivní srovnávací studie.
MUDr. Miroslav Solař
IGA MZ ČR NA/7248-3 (FN)
41. Význam monitorování metabolismu lipidů procesu stárnutí
RNDr. Dagmar Solichová
IGA MZ ČR NG/6770-3 (FN)
42. Fotopická elektroretinografie u diabetu
prof. MUDr. Jaromír Svěrák, DrSc.
IGA MZ ČR NK/6835-3 (FN)
43. Invazivní měření kardiovaskulárních funkcí u králíka
MUDr. Václav Šafka, Ph.D.
FRVŠ 2521 (LF)
44. Využití analyzátoru Reflotron pro modernizaci výuky preventivního lékařství
doc. MUDr. Jindra Šmejkalová, CSc.
FRVŠ 2522 (LF)
45. Vnímání rizika a míra zdravotního uvědomění u zaměstnanců různých profesí
doc. MUDr. Jindra Šmejkalová, CSc.
GA UK 90/01 (LF)
46. Sledování a porovnání osudu biologických a syntetických materiálů implantovaných do kostních defektů
MUDr. Pavel Šponer
IGA MZ ČR ND/6853-3 (LF)
47. Interaktivní atlas pro výuku embryologie člověka
doc. MUDr. Danuše Šubrtová, CSc.
FRVŠ 2529 (LF)
48. Efektivitu biventrikulární stimulace lze hodnotit změnami neinvazivně měřené pulzové amplitudy
MUDr. Miloslav Tauchman
IGA MZ ČR NA/7261-3 (FN)

49. Terapeutická ovlivnění kognitivních funkcí u schizofrenie

MUDr. Ivan Tůma, CSc.

IGA MZ ČR NF/6753-3 (LF)

50. Frakcionace amaranthu a využití jeho aktivně zušlechtěných složek ke zlepšení výživy a zdraví populace

(nositel projektu: AMR AMARANTH, a.s., Hradec Králové)

odp. řešitel dílčího úkolu: **prof. MUDr. Zdeněk Zadák, CSc.**

MPO ČR FB-C3/10/00 (LF)

51. Komplexní využití biomasy Amaranthu

(nositel projektu: AMR AMARANTH, a.s., Hradec Králové)

odp. řešitel dílčího úkolu: **prof. MUDr. Zdeněk Zadák, CSc.**

MPO ČR FD-K2/73 (LF)

52. Vývoj tukové emulze pro parenterální výživu a technické řešení její aplikace

(nositel projektu: Infusia, a.s., Hořátev, Sadská)

odp. řešitel dílčího úkolu: **prof. MUDr. Zdeněk Zadák, CSc.**

MPO ČR FD-K/033/01 (LF)

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

Title of the research project: Imaginating system in the teaching of haematology and immunology

Grant Agency: Ministry of Education

Project Number: 2509/F3/02

Principal Researcher: Michaela Adamcová

Joint Researchers: Zuzana Červinková, Helena Živná

Starting date: 1.1.2001

Duration (years): 1

Funds allocated for project - total in Czech crowns: 169000

Summary of 2002 results

Title of the presentation: Fagocytosis of fungi

Authors: Michaela Adamcová, Zuzana Červinková, Helena Živná, Otto Kučera

Fac. Med., Charles Univ., Hradec Králové: Dpt. of Physiology

This project was aimed to improve interaction between the assistant and the students during the teaching of practical classes in physiology. The purchase of the microscope CX41 with phase contrast and objectives 10x, 40x and 100x (fa Olympus) together with Sony CCD TV camera and their connection with dataprojector enable to demonstrate many tasks from haematology and immunology (e.g. the red blood cell count, blood in solutions of different concentration, microscopic observation of human blood and blood of poikilothermic animals, hemin or Teichman's crystals, the total white blood cell count, classification of white blood cells and the platelet count), which do the teaching more effective and more instructive. The possibility of methodological supervision, the simultaneous possibility to show and describe the observed object during microscoping to all students at the same time lead to more precise laboratory work of students.

The integral part of this project was to establish a new practical class dealing with the phagocytosis of fungi. The heparinized blood is incubated with the fungi *Saccharomyces cerevisiae* during 1 hr, then the blood smears are prepared and stained after Giemsa-Romanovski. At the end, the number of phagocytosing cells of total leucocytes count or of total cell count with phagocytic capability (i.e. neutrophils and monocytes) is determined microscopically and expressed in percentage. This relatively easy laboratory method, which is used in clinical practice for evaluation of non-specific cellular immunological reactivity (Kašlík et al. 1979), enables to learn the basic principles and discuss new problems of immunology that represents relatively rapid developing branch of medicine.

Literature: J. Kašlík et al.: *Praktický lékař* 59(8): 297-301, 1979

Project was supported by the Ministry of Education Grant Agency, No 2509/F3/02

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

Title of the research project: Study of changes of cardiac regulatory proteins in different pathological states

Grant Agency: Charles University

Project Number: 81/2002

Principal Researcher: Michaela Adamcová

Joint Researchers: Vladimír Geršl, Radomír Hrdina, Ivona Klimtová, Tomáš Šimůnek, Michal Šitina

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 350000

Summary of 2002 results

Title of the presentation: Cardiac troponin T in daunorubicin-induced cardiomyopathy

Authors: Michaela Adamcová (1), Vladimír Geršl (2), Radomír Hrdina (3), Ivona Klimtová (3), Tomáš Šimůnek (3)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Physiology (1), Dept. of Pharmacology (2),
Fac. Pharmacy, Charles Univ., Hr. Králové: Dept. of Pharmacology and Toxicology (3)

The protein remodeling of myocardium was studied in three groups of Chinchilla male rabbits: 1) daunorubicin (3 mg/kg i.v.), 2) daunorubicin (3 mg/kg i.v.) + dexrazoxane (60 mg/kg i.p.) and 3) the control group (saline 1 mL/kg i.v. in the same schedule). The drugs were given once weekly, max. 10 administrations. Protein fractions were isolated by stepwise extraction from the samples of left ventricle (Pelouch et al. 1995). After the isolation SDS-PAGE was carried out; further proteins were immunoblotted onto nitrocellulose membrane and analysed using JLT-12 MAb (Sigma Chemicals).

Daunorubicin-induced cardiomyopathy was accompanied with the changes of cTnT isoforms expression. While, isoform with the higher molecular weight cTnT 1 (16.0 ± 3.8 %) was found in the control group besides the dominant isoform cTnT 2 (75.7 ± 3.5 %), the isoform cTnT 1 was absent in daunorubicin-induced cardiomyopathy. Furthermore besides major cTnT 2 (89.0 ± 1.5 %) the isoform with the lower molecular weight cTnT 3 was also expressed (7.7 ± 0.8 %). The finding in the group treated with daunorubicin and dexrazoxane was comparable with the control group (TnT 1 – 14.3 ± 2.2 % a TnT 2 – 80.2 ± 2.8 %). The changes of regulatory protein - cardiac troponin T in daunorubicin-induced cardiomyopathy can be considered to be one of factors, affecting significantly the contractility of myocardium during the antitumourous therapy with anthracyclines.

Literature: V. Pelouch et al.: Mol. Cell. Biochemistry 147, 43-49, 1995

Project was supported by the Charles University Grant Agency, No. 81/2002

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

Title of the research project: Quality improvement of preclinical fantom laboratory course in dental curriculum

Grant Agency: Ministry of Education

Project Number: 2510/F3a

Principal Researcher: Petr Bednar

Joint Researchers: Daniel Cerny, Simona Saglova

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 180000

Summary of 2002 results

Title of the presentation: Quality changes in the preclinical fantom laboratory preparation

Authors: Petr Bednar (1), Daniel Cerny(1), Simona Saglova(1)

Fac. Med., Charles Univ., Hr. Kralove: Dental Clinic

Practical preclinical education of dentistry students is based on preclinical fantom laboratory courses. This courses last first two years of the studies. Students learn basic technological steps in the teeth treatment and preparation. All these procedures are made on fantom, model teeth. The more similar is the model to real teeth, especially with physical properties, the better habits with its preparation the students get. The innovation of our programme, for what we asked the funds from the Dpt of Education, was to buy new, technologically highly performed fantom teeth from the Frassaco company. The Frassaco Co. is well known producer of the Fantom teeth, and their models are widely used in preclinical courses in foreign dental programmes.

The advantage of the Frassaco models is in realistic tooth morphology, hard plastic, similar to the hard tooth tissues, and the similar reaction of this plastic for mechanical preparation (lines of fractures, etc.).

From the purchase of these better models we hope to better simulate real teeth treatment in this early courses for dental students to become more self confident and more manually skilled for later practical treatment in real patients.

Project was supported by the Ministry of Education project, No.2510/F3a/2002

Address for correspondence: P. Bednar, Dental Clinic, Teaching hospital, Sokolska 408, 500 05, Hradec Kralove, 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, Vladimír Bláha, Jaroslav Malý, Melanie Skořepová, Martin Blažek, Radek Hyšpler

Starting date: 1.1.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 498000

Summary of 2002 results

Title of the presentation: LDL-apheresis - results of the long time treatment

Authors: Milan Bláha(1), Zdeněk Zadák(2), Vladimír Bláha(2), Jaroslav Malý(1), Melanie Skořepová(1), Martin Blažek(1), Radek Hyšpler(2)

Fac.Hosp., Hr.Kralove, Dept.of Clin.Haematol. (1), Metabolic Clinic(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 aimed at developing of suitable (technically and economically acceptable) treatment regime, without dangerous side-effects. They were made another 173 procedures in the year 2002. The method of LDL-apheresis with Pokard absorber and automatic absorption-desorption automat (Medicap, Germany) was effective, relatively very safe (the most often were short episodes of citrate toxicity). The treatment was succesful to stop the progress of atherosclerosis in 2 patients, regression is continuing in 5 patients and 1 patient progressed. 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. The examination of selectins: It was made 80 measuring repeatedly in 6 patients. There is an increased level of P-selectin and MCP-1 in the the blood of patients with FH in spite of long-term intensive treatment. Immediately after the LDL-apheresis decreases P-selectin and MCP-1 significantly and can be used as an further marker of treatment effectivity. Project was supported by the Ministry of Health Grant Agency , No NB6549-3, 6822-3,7006-3.

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

Title of the research project: Prediction, optimization and individualization of therapeutic procedure in LDL-apheresis - a multivariate model in a prospective study

Grant Agency: Ministry of Health

Project Number: NB7006-3

Principal Researcher: Milan Bláha

Joint Researchers: Zdeněk Zadák, Vladimír Bláha, Jaroslav Malý, Melanie Skořepová, Vladimír Mašín

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 494000

Summary of 2002 results

Title of the presentation: The computerized model of prediction, optimization and individualization of LDL-apheresis

Authors: Milan Bláha(2), Zdeněk Zadák(1), Vladimír Bláha(1), Jaroslav Malý(2), Melanie Skořepová(2), Vladimír Mašín(3)

Fac.Hosp., Hr.Kralove: Metabolic clinic(1), Dept.of Clin.Haematol. (2); Fac. Med., Charles Univ., Hr. Kralove: Kat. of Biophysic(3).

The aim of the work is to define the most important factors involved affecting the results of LDL-apheresis and to predict the optimal course of therapy by mathematical model, verify variants of individual models in practice and adapt them for clinical use. Two automatic systems were used for LDL-apheresis – blood cell separator (Cobe Spectra, USA) and adsorption-desorption automat ADA (Medicap, Germany).

The analysis of results show that the system is demanding medically, technically and, economically, as well. Nevertheless, side effects are mostly rare complications in the hands of experienced staff (6,6% of 173 procedures in the last year). That is why the system was accepted as suitable for the development of a mathematical model for multifactorial analysis. A follow-up protocol has been prepared using actual plasma volume, actual and target LDL-cholesterol level, exponential dynamic of cholesterol elimination, capacity of column, maximal time allowed and maximal number of cycles allowed. The main problem was how to determine individual optimal plasma volume and the exact time when the column is loaded, when is necessary to switch over by ADA to the second column and what factors have to be taken into the consideration of it.

We have noted that despite a number of known factors influencing the therapy, only some of them are really important and it would be possible to use them for prediction of accurate and “tailored” procedure according to the actual conditions of the patients and absorption columns. The first software was developed and is prepared for the clinical use and tests. Project was supported by the Ministry of Health Grant Agency, No NB7006-3.

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

Title of the research project: 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: Vladimír Bláha

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: 1850000

Summary of 2002 results

Title of the presentation: Cholesterol absorption and biosynthesis 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)

There is general but not universal agreement that cholesterol biosynthesis is increased after hypolipidemic intervention, including LDL-apheresis. To evaluate functional importance of cholesterol biosynthesis in atherogenesis we analyzed cholesterol pathway and its intermediary metabolites after LDL-apheresis in hypercholesterolemic subjects. Patients with severe hypercholesterolemia, were treated by LDL-apheresis, diet and hypolipidemic drugs (n=6, age 16-58y, 3 men, 3 women). LDL-apheresis was performed using immunoadsorption. Analytical methods: Cholesterol synthesis and analysis of its intermediary precursors (squalen, lanosterol, lathosterol), sitosterol and campesterol were analyzed in blood using gas chromatography/mass spectrometry before and after LDL-apheresis. Results: LDL-apheresis significantly reduced plasma cholesterol (8,3+0,9 mmol/l vs. 3,0+0,8 mmol/l, p<0,001). Plasma squalen did not change significantly (5,6+4,8 mmol/l vs. 1,1+0,6 mmol/l, n.s.). The cholesterol biosynthesis non-significantly decreased, as measured by plasma lathosterol (69,8+35,4 mmol/l vs. 9,0+4,4 mmol/l, p=0,063) and/or lathosterol/cholesterol ratio (8,4+4,2 mmol/l/mmol/l vs. 2,6+1,0 mmol/l/mmol/l, p=0,063). The cholesterol absorption after LDL-apheresis was significantly decreased, as revealed by plasma sitosterol (71,3+58,6 mmol/l vs. 14,8+9,6 mmol/l, p=0,031). Sitosterol/cholesterol ratio did not change significantly (10,5+9,0 mmol/l/mmol/l vs. 6,2+4,4 mmol/l/mmol/l, p=0,688). Plasma campesterol decreased (222,2+99,6 mmol/l vs. 37,2+10,4 mmol/l, p=0,100). Campesterol/cholesterol ratio did not change significantly (32,6+16,1 mmol/l/mmol/l vs. 14,3+5,0 mmol/l/mmol/l, p=0,219). We conclude that aggressive lipid lowering procedure with LDL-apheresis did not induce acute significant changes in cholesterol biosynthesis, and was associated with increased cholesterol absorption.

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: Atherogenic role of disorders of fatty acid and cholesterol metabolism in coronary atherogenesis in diabetes mellitus type II

Grant Agency: Ministry of Health

Project Number: NB/6999-3

Principal Researcher: Vladimír Bláha

Joint Researchers: MUDr. Dušan Černohorský, RNDr. Dagmar Solichová, RNDr. Petr Žďánský, CSc., MUDr. Pavel Vyroubal, MUDr. Radomír Hyšpler, PhD, prof. MUDr. Zdeněk Zadák, CSc.

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1800000

Summary of 2002 results

Title of the presentation: Lipoperoxides, alpha-tocopherol and fatty acids as biomarkers of risk from coronary atherosclerosis

Authors: Vladimír Bláha (1), Dušan Černohorský (1), Dagmar Solichová (1), Radomír Hyšpler (1), Petr Žďánský (1), Pavel Vyroubal (1), Zdeněk Zadák (1), Faculty Hospital, Charles University, Department of Gerontology and Metabolic Care (1)

There has been a growing interest of in the quantitative determination of biochemical predictors of atherogenesis. The aim of the present study was to investigate association of lipoperoxidation biomarkers known to be pro-atherogenic (thiobarbituric acid reactive substance activity) or anti-atherogenic (alpha-tocopherol) with the fatty acid status, and relate it to the coronary artery disease as assessed by coronary angiography. Eighty hyperlipidemic patients (age 33-74 years) who underwent an elective coronary angiography for coronary artery disease (CAD), were divided into four groups based on the severity of CAD. Results: Serum lipoproteins and TBARS did not differ significantly. However there was significant correlation of TBARS with total vitamin E ($p=0,02$) and vitamin E in VLDL ($p=0,02$) and LDL ($p=0,01$). There was significant correlation of TBARS with LDL-linoleic acid ($p=0,01$), and HDL-linoleic acid ($p=0,02$). There was significant correlation of total vitamin E ($p=0,01$) and VLDL-vitamin E ($p=0,01$) with the degree of CAD. In conclusion, the results of this study did not show difference in lipid peroxidation status between asymptomatic patients with stable angina pectoris. Both TBARS and a-tocopherol could not be evaluated as biomarkers for the severity of coronary artery disease in patients with stable angina pectoris. Pro-atherogenic lipoperoxidation, as revealed by TBARS, was not associated with the severity of coronary artery disease, which may be explained also by the effect of well-established control of hyperlipidemia using hypolipidemic treatment. Oxidation hypothesis of atherosclerosis has been supported by significant correlation of TBARS with LDL-linoleic acid and HDL-linoleic acid, and negative impact of coronary artery disease was compensated by antioxidation defense, namely total alpha-tocopherol and its VLDL- and LDL fraction.

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 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, Viera Dytrychová

Starting date: 1.1.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1472000

Summary of 2002 results

Title of the presentation: The comparison of dalteparin and unfractionated heparin during PTCA - clinical and laboratory data.

Authors: Miroslav Brtko (1), Ivo Varvařovský (2), Pavel Polanský (1), Viera Dytrychová (3) Charles University, University Hospital, Hradec Králové, Dept. of Cardiac Surgery (1), Dept. of Clinical Haematology (3), Nemocnice Pardubice, Kardio-troll s.r.o. (2)

To prevent thrombembolic complications during coronary interventions (PCI) unfractionated heparin (UFH) is used as a standart therapy. UFH have some disadvantages (indirect thrombin inhibition, interaction with platelet factor 4, stimulation of thromboxan synthesis, interaction with platelet adhesion and aggregation). Low-molecular weight heparin (LMWH) could overcome some of these disadvantages. In 2002 we evaluated the influence of UFH and LMWH (dalteparin) on platelet functions and clinical course in 328 patients undergoing elective PCI. There were no statistical significant differences in an occurrence of thrombotic, ischemic and haemorrhagic complications between UFH and LMWH groups (dissection or occlusion of the vessel, presence of intracoronary thrombus, TIMI flow, occurrence of pseudoaneurysm or haematoma of the puncture site, value of CK, CK-MB and TnT after the procedure). The application of LMWH ensured the satisfactory anticoagulation effect throughout the whole procedure (comparable with the application of UFH). A significant decrease of platelet count was observed after administration of both UFH and LMWH (both $p < 0,001$); between groups NS. A significant increase of thrombocyte aggregation induced by ADP, epinephrine and arachidonic acid ($p < 0,001$) was seen after administration of UFH; between groups $p < 0,01$. LMWH increased only platelet aggregation induced by epinephrine ($p < 0,001$). The application of both UFH and LMWH had no influence on the platelet aggregation induced by collagen and thrombin. The concentration of beta-thromboglobulin decreased after the administration of dalteparin ($p < 0,05$); no change after UFH. We observed no changes in the concentration of thromboxan B2 and thrombin-antithrombin complex after the usage of both UFH and LMWH.

Address for correspondence: M. Brtko, University Hospital, Dept. of Cardiac Surgery, Sokolská str. No. 581, 500 05 Hradec Králové, Czech Republic

Title of the research project: Visual acuity and contrast sensitivity after implantation of phakic IOL in myopia

Grant Agency: Ministry of Education

Project Number: 2523/G3A/02

Principal Researcher: Lisa Bytton

Joint Researchers: Dagmar Hejcmanová

Starting date: 2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 44000

Summary of 2002 results

Title of the presentation: Visual acuity and contrast sensitivity after implantation of phakic IOL in myopia

Authors: Lisa Bytton, Dagmar Hejcmanová, Hana Langrová, Alena Feuermannová, Pavel Rozsíval

Charles University Prague, Facultas Medica Hradec Králové: Dept. Ophthalmology

The aim of the study was to evaluate the influence of phakic IOL in myopia on contrast sensitivity, glare and logMAR best corrected visual acuity (BCVA) up to 6 months postoperatively. 20 myopes with mean age of 31 years (range 19 to 44 years), mean spherical equivalent of -10.5 ± 3.86 D (range -19.00 to -6.00 D) and mean BCVA 0.59 ± 0.64 (range 0.28 to 1.18) were examined before implantation of phakic IOL and 1, 3 and 6 months after surgery. Contrast sensitivity (CS) was tested on Contrast sensitivity 8010 System at 6 spatial frequencies between 0.74 and 29.55 c/deg, BCVA was measured on logMAR charts with Landolt rings. Influence of glare of 342.6 cd/m² was evaluated using BAT (Brightness Acuity Tester). At 6 months postoperatively, mean spherical equivalent was 0.0 D (range -1.00 to 0.00 D). BCVA improved significantly ($p < 0.001$), mean BCVA was 1.0 ± 0.68 (range 0.48 to 1.45). CS improved significantly in all spatial frequencies tested ($p < 0.05$ to $p < 0.001$). Glare had not significant influence on BCVA and CS. The significant improvement of CS and BCVA suggest that phakic IOL improve quality of vision in myopic eyes. The manuscript was submitted for publication in Cesk and Slov Ophthalmol.

Supported by Grant of Ministry of Education to LB No. 2523/ G3A/02 and by Grant of Grant Agency of Czech Republic No. 309/00/D056

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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: 566000

Summary of 2002 results

Title of the presentation: Somatostatin analogues in the treatment of acromegaly.

Authors: Jan Čáp (1), Jaroslav Cerman (2), Martina Mareková (2), Jiří Náhlovský (3), Petr Šuba (2,3), 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). First Fac. Med. Prague: Dept. Neurosurgery (4), 3rd Med. Dept. (5)

In the clinical part of the study 14 patients were treated with a somatostatin analogue for three months until surgery. Tumour shrinkage was observed in seven of them. Histopathological changes, proliferative index (Ki-67), and incidence of apoptosis (caspase-3 and M30 antigen) were compared with those in a reference group of 17 un-pretreated adenomas. In treated adenomas more prominent regressive changes and loss of tissue were found with compensatory fibrosis. The Ki-67 labelling index was lower in the treated group (median 1.6 per mille) than in untreated patients (median 5.0, $p = 0.049$). Apoptosis was detected in only 2 of the 14 pre-treated adenomas, and it was more frequent (9/17) in the untreated group.

In the experimental part we studied the inhibitory effects of somatostatin analogues with relative specificity to somatostatin receptor (SSTR) subtype 2 (BIM-23197), subtype 5 (BIM-23268) and their combination on GH and PRL secretion in acromegalic adenomas in vitro.

Three types of response were observed. (1) In one resistant adenoma no inhibition was achieved. (2) The GH secretion was suppressed in six adenomas significantly more with SSTR2 specific analogue (in concentration range of 1-1000 pmol/l) without an additive effect of the two compounds combination. (3) In three adenomas the potency of BIM-23197 and BIM-23268 was almost equal and the combination of these SSTR2 and SSTR5 specific compounds had statistically significant additive effect ($p < 0.05$ or $p < 0.01$). PRL secretion of five adenomas was suppressed more with SSTR5 specific BIM-23268.

Supported by the grant No. NB/6172-3 of IGA MH and project 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 2002 results

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

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)

Background: 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. Small series of patients in whom hypertension was treated by neurosurgery have been published. 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). The results of the published MR studies differ due to methodological problems.

Methods: We examined 43 patients with severe essential hypertension and 45 age-, sex-, and body mass index-matched normotensive subjects. MR imaging protocol consisted of transverse and coronal T2 TSE (slice thickness 3 mm), transverse 3D TOF MRA (0.8 mm) and 3D CISS (1 mm) sequences. The presence and degree of NVC at the rostral medulla and particularly at the left RVLM were evaluated together with the conspicuity of the anatomical structures on different MR imaging sequences.

Results: Among 43 hypertensive patients, 34 (79%) showed NVC of the medulla at any location and 14 (33%) at the left RVLM. In the control group of 45 normotensive subjects, 35 (78%) showed NVC of the medulla and 17 (38%) of 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.

Project is supported by the Ministry of Health Grant Agency, No NA/6169-3

Address for correspondence: J. Ceral, Dept. of Internal Medicine, Charles University in Prague, Teaching Hospital in Hradec Kralove, 500 05, Czech Republic

Title of the research project: Measurement of concentration and purity of DNA - new practical class in biology

Grant Agency: Ministry of Education

Project Number: 2519/F3

Principal Researcher: Miroslav Červinka

Joint Researchers: Jan Peychl, Emil Rudolf, Jana Kolářová

Starting date: 1. 1. 2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 182000

Summary of 2002 results

Title of the presentation: Assessment of concentration and purity of DNA

Authors: Miroslav Červinka, Emil Rudolf, Jana Kolářová

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

In the past years, we have managed (always with the generous support of FRVŠ) to implement all the basic laboratory techniques necessary for manipulation with DNA (isolation of DNA from whole human blood, agarose gel electrophoresis, DNA purification etc.) to the practical classes in biology. This project enabled us to introduce other techniques in which our students will be given opportunity to measure DNA content and purity in their own isolated DNA samples prior to agarose gel electrophoresis. The current activity is connected with the project No. 1279/1999 FRVŠ "Comprehensive use of human blood in the practical classes at faculty of medicine" and it is hoped that it will contribute to the further improvement of practical classes while permitting a broader experience of future doctors with molecular laboratory functioning. To implement the planned task, we purchased UV spectrophotometer (BioPhotometer Eppendorf) and prepared a manual for this class available on Intranet. This new task is a part of our syllabus for practical classes in the academic year 2002/2003 both for general medicine students (2. study year) and dentistry students (1. study year). In total, it concerns about 150 students per year. First responses from students are positive; in particular this kind of improvement of practical classes is appreciated.

Supported by grant of Ministry of Education No. 2519/F3

Address for correspondence:

M. Červinka, Dept. Medical Biology and Genetic, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 50038 Hradec Králové, Czech Republic.

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

Grant Agency: Ministry of Education

Project Number: LN00AO3

Principal Researcher: Jiří Stulík

Joint Researchers: Miroslav Červinka, Jan Krejsek, Emil Rudolf, Hana Andělová, Zdeněk Fiedler, Monika Holická, Jana Havlasová, Martina Loudová, Věra Pelantová

Starting date: 1.1.2000

Duration (years): 5

Funds allocated for project - total in Czech crowns: 2550000

Summary of 2001 results

Title of the presentation: Advances in understanding of intracellular parasitism of *Francisella tularensis*

Authors: M. Červinka (1), J. Krejsek (2), E. Rudolf (1), H. Andělová (1), Z. Fiedler (1), M. Holická (2), J. Havlasová (2), M. Loudová (2)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Medical Biology and Genetics (1), Dept. of Clinical Immunology (2)

The nature and dynamics of infection with *F. tularensis* LVS/GFP was studied on murine macrophage cell line J744 with help of phase contrast and fluorescence videomicroscopy. Intracellular trafficking of bacterial particles was analyzed by means of isopycnic centrifugation, with planned implementation of step gradient particle isolation technique in future. Furthermore, electron microscopy was employed to follow the fate of ingested bacteria inside the cell. We expect to continue in the analysis using immunoelectron microscopy as well as fluorescence microscopy. These results will be compared with an *ex vivo* model.

The changes in the expression of selected 12 surface and 1 intracellular markers on J774 cells were analyzed using direct immunofluorescence and flow cytometry. Three distinct macrophage populations are developing 12 hours after infection. The first population with no changes in the expression of any selected marker are probably uninfected cells. The second population with the most profound phenotypic changes are very likely primary infected cells. The most significant phenotypic changes in this population are the upregulation of HLA II and class molecules and simultaneous decrease in the expression of CD11a, CD11b, CD54 adhesion molecules together with decrease of CD16/CD32 receptor for IgG and transferrin receptor. In the following experiments J774 cell-line was stimulated by interferon gamma before infection. The resistance of interferon gamma stimulated cells to *F. tularensis* was increased. There was the significant increase in the expression of both CD14 and CD80 molecules after interferon treatment.

This project was supported by Ministry of Education grant LN00AO3.

Address for correspondence: M. Červinka, Dept. Med. Biol., Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 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: 1.1.2000

Duration (years): 3

Funds allocated for project - total in Czech crowns: 3163000

Summary of 2001 results

Title of the presentation: Serious organ failures - experimental and clinical models

Authors: M. Červinka (1), J. Cerman (2), I. Dřížhal (3), V. Geršl (4), J. Horáček (5), M. Kuba (6), Y. Mazurová (7), N. Jirásková (8), Z. Kaška (9), P. Živný (10)

Fac. Med., Charles Univ., Hr. Králové, Depts: Med. Biol. (1), Med. Biochem. (2), Stomatol (3), Pharmacol. (4), Microbiol. (5), Path. Physiol. (6), Histology (7), Ophthalmol. (8), Surgery (9), Clin. Biochem. (10)

In this multidisciplinary project the following topics were studied during 2002:

1) Incidence of apoptosis in several in vitro and in vivo models (pituitary adenoma cells, leukemic cell line, epithelial cells) using immunocytochemical detection of the specific markers of the cascade of caspases activation. Experimental study involves ionizing radiation, induction by Etoposide and chromate. 2) The protein remodeling of myocardium was studied in daunorubin-induced cardiomyopathy in the rabbit model. Furthermore, cardioprotective effect of dexrazoxane was demonstrated. 3) Verification of a diagnostic value of enlarged set of visual evoked potentials in patients with multiple sclerosis and with neuro-ophthalmological disorders - Comparison of sensitivity of evoked potential and MRI was performed. 4) Changes in the structure of neurotoxic lesion of striata - comparison of ibotenate and kainate model. Assessment of proliferation activity in subependymal layer of lateral ventricle of the brain. 5) Incidence of secondary cataract after implantation of several types of intraocular lens was analysed. 6) Bacterial complications after organ and cell transplantations were investigated. 7) Dynamics of serum leptin concentrations as a possible marker of stress in some surgical patients during short perioperative period. Changes are more expressed in the malignant bowel disease group. 8) Comparison of amino acids concentrations in liver interstitium than in muscle interstitium in early postoperative phase after partial hepatectomy and laparotomy in rats. Lower amino acid concentrations in liver interstitium in comparison with muscle interstitium were observed.

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 38 Hradec Králové, Czech Rep.

Title of the research project:

Innovation of practical teaching of physiology at Faculty of Medicine in Hradec Králové

Grant Agency: Ministry of Education**Project Number:** 2528/H/2002**Principal Researcher:** Zuzana Červinková**Joint Researchers:** Halka Lotková, Michaela Adamcová**Starting date:** 1.1.2002**Duration (years):** 1**Funds allocated for project - total in Czech crowns:** 630000**Summary of 2002 results****Title of the presentation:** Oxygraphic evaluation of energy metabolism in isolated hepatocytes**Authors:** Zuzana Červinková, Halka Lotková, Michaela Adamcová
Fac. Med. Charles Univ., Hr. Králové: Dept. Physiology

The aim of the project was to build new laboratory which considerably contributes to improve teaching of practical classes in physiology. Laboratory equipped by laminar box, high-resolution oxygraphy, spectrophotometer and centrifuge is an essential condition to replace animal experiments which were dramatically reduced due to legislative, ethical and economic reasons, by in vitro experiments.

Our syllabus in practical classes of physiology is unsatisfactory in bioenergetics. Therefore we prepared new practical classes which replenish this gap, namely, isolation of living cells (rat hepatocytes) including viability tests, isolation of subcellular fraction (mitochondria), measurement of oxygen consumption in cells, tissue homogenates and mitochondria using high-resolution oxygraphy (OROBOROS Oxygraph 2k). To give the students theoretical background for the practical classes we prepared paper Oxygraphic evaluation of energy metabolism in isolated hepatocytes (in press - Acta Medica). The paper presents protocol for evaluation of energy metabolism in rat hepatocytes with the aid of high-resolution oxygraphy. We described in detail the experimental schemes for oxygraphic evaluation of the individual enzyme complexes of the respiratory chain (Complex I, II, IV) and methods for the assessment of the mitochondrial function of phosphorylation using the respiratory control index and oligomycin inhibitory effect on ADP-activated respiration. On the example of oxidative damage of hepatocytes by tert-butylhydroperoxide, we demonstrate the utility of oxygraphy in the diagnostics of pathologic conditions caused by disturbances in energy metabolism of the cell.

Project was supported by the Ministry of Education Grant Agency, No 2528/H/2002.

Address for correspondence: Z. Červinková, Dept. of Physiology, Charles Univ. in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 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: 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: 2873000

Summary of 2002 results

Title of the presentation: Different approaches to study of acute and chronic liver injury in 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 continued according to the plan in all four main themes. Twenty researchers from seven departments of our faculty participated on the project. Following main topics were studied during the last year:

- a) Model of galactosamine injury in primocultures of rat hepatocytes has been introduced.
- b) Using common functional tests of hepatocyte functions in tissue culture complemented by evaluation of mitochondrial transmembrane potential (rhodamine 123 accumulation) and energy metabolism (high-resolution oxygraphy) the protective effect of S-adenosylmethionine against galactosamine injury has been documented.
- c) Hepatoprotective effect of S-adenosylmethionine on hepatocyte primary culture exposed to t-butylhydroperoxide has been approved by evaluation of the activity of mitochondrial dehydrogenases, mitochondrial transmembrane potential and energy metabolism.
- d) Differences in selected biochemical markers and histological findings after bile duct ligation in male and female rats (Adv Clin Path 2001,5:147-153).
- e) Changes in serum leptin concentration after surgery including partial hepatectomy in young rats (Nutrition 2002, 18:643-646).
- f) Influence of pravastatin - a potent inhibitor of HMG-CoA-reductase and high cholesterol diet on liver regeneration in rats after partial hepatectomy (Nutrition 2002,18:51-55).
- g) Up-regulation of tropoelastin expression in activated hepatic stellate cells and in the livers of CC14-cirrhotic rats (Liver 2002,22:220-227).
- h) Retrospective investigation of hepatic encephalopathy in 197 non-diabetic and 59 diabetic patients after transjugular portosystemic shunt (Vnitř Lék 2002,48:390-395).

Address for correspondence: Z. Červinková, Department of Physiology, Charles Univ. in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Republic

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 2002 results

Title of the presentation: Effects of repeated administration of a new iron chelator - Salicylaldehyd Isonicotinoyl Hydrazone - in rabbits in vivo.

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

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 (5); McGill Univ., Montreal: Dept. Physiol. Med. (6)

Salicylaldehyd Isonicotinoyl Hydrazone (SIH) is an effective iron chelator with antioxidant effects (as documented in numerous in vitro studies). Thus, from the viewpoint of possible therapeutic indications of the drug, the knowledge of its influence on various parameters in animals in vivo is essential. In this study, the effects of repeated administration of SIH (50 mg/kg in 10% Cremophor; once weekly, 10 weeks, i.p.) on cardiovascular, biochemical, haematological and histological parameters were investigated in rabbits in vivo. Obtained data were compared with the control group (saline, 1 ml/kg, i.v.) and the Cremophor group (10% Cremophor solution in water, 2 ml/kg, i.p.). No significant differences were mostly found between the SIH group (e.g., LV ejection fraction 61.0 % at the beginning and 60.6 % at the end of experiment; PEP/LVET between 97.7 and 101.2 %; a mild, though significant, increase in dP/dtmax.; only few and transient changes in most of the biochemical and haematological parameters; body weight increase) and the other groups. The mild morphological changes in kidney were found not only in the SIH group but also in the Cremophor group. These results warrant further extended studies. However, it can be concluded that SIH seems to be relatively non-toxic, which is promising from the standpoint of its possible use in pathological states.

Supported by 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: Basics of clinical microbiology - multimedial textbook

Grant Agency: Ministry of Education

Project Number: 2531/F3/02

Principal Researcher: Irena Hanovcová

Joint Researchers: Jiřina Lesná, Lenka Ryřková

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 166000

Summary of 2002 results

Title of the presentation: Basics of clinical microbiology - multimedial textbook

Authors: Irena Hanovcová (1), Jiřina Lesná (1), Lenka Ryřková (2)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Clin. Microbiology (1), Fac. Hospital, Hr. Králové, Inst. of Clin. Microbiology (2)

Topic of final seminars of the course of medical microbiology is clinical microbiology. For this purpose there were created four basic chapters of clinical microbiology (Infections of the respiratory tract, Infections of the gastrointestinal tract, Infections of the urinary tract and Infections of the central nervous system) which are located on public web pages of the department of microbiology (czech version, part education):

http://www.lfhk.cuni.cz/klinmikrob/vyuka/index_uvod.htm

In each chapter students find overview of infection diseases of given system and their cause, short description of single pathogens, pathogenesis, laboratory diagnosis, possibility of treatment and prevention. The text is illustrated by micro- and macrophotographs of pathogens, tables and schemas. There are also mentioned typical clinical cases. The knowledge of given thema could be verified in short multiple choice tests. There are add links to other microbiological web pages on which students can find more detailed and actual informations. Text is complemented by index of all mentioned pathogen which allows direct access to description of single pathogens.

Literature: Horáček, J. et al: Základy lékařské mikrobiologie , Karolinum Praha, 2000

Ryřková, O. et al : Návody k praktickým cvičením z lék. mikrobiologie,
Karolinum Praha, 1997

Bednář, M. et al.: Lékařská mikrobiologie. Marvil 1996

Banister, B.A. et al.: Infectious disease, Blackwell Sci. 2000

Project was supported by the Ministry of Education, No 2531/F3/02

Address for correspondence: Irena Hanovcová, Dept. of Clin. Microbiology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Faculty Hospital, Sokolská, 500 05 Hradec Králové, Czech Republic

Title of the research project: Imaging methods using ionizing radiation, principle of CT

Grant Agency: Ministry of Education

Project Number: 2512

Principal Researcher: Josef Hanuš

Joint Researchers: Jiří Záhora

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 240000

Summary of 2002 results

Title of the presentation: Principle of CT imaging method

Authors: Josef Hanuš, Jiří Záhora

Fac. Med., Charles Univ., Hradec Králové: Dept. of Medical Biophysics

The innovation of practical course of Biophysics and Biostatistics was the main aim of this project. Funds allocated for these project were used for modern technical support of new practical task for students. The new task is focused on theoretical explanation and especially on practical verification of physical principles of CT (computed tomography) which is one of the most important imaging methods in medicine using ionizing radiation. The task supposes practical measurement of absorption of ionizing radiation in different samples of materials which simulate volume elements (voxel) of different tissues arranged in the matrix structure. Measurements are made by computer controlled scintillation detector JKA 300. The spectrometer JKA300 enables digital setting of parameters of measurement, it means time of measurement, number of channel, integral or differential measurement etc. Measured data are elaborated by Excel program, the linear absorption coefficient for each tested sample cube is calculated from the set of linear equations. The imaging of the result structure of the matrix of element on the base of their CT numbers is the practical output of the task. The instruction for this task and sample protocol are also available for students on Intranet.

Project was supported by Ministry of Education, No 2512/2002

Address for correspondence: Josef Hanuš, Dept. of Medical Biophysics, Charles University in Prague, Medical faculty in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Republic

Title of the research project: Innovation of practical lessons in ophthalmology - examination using the slit lamp

Grant Agency: Ministry of Education

Project Number: 2513/F3A/02

Principal Researcher: Dagmar Hejčmanová

Joint Researchers: Hana Langrová, Vladimír Korda

Starting date: 2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 196000

Summary of 2002 results

Title of the presentation: Innovation of practical lessons in ophthalmology - examination using the slit lamp

Authors: Dagmar Hejčmanová, Hana Langrová, Vladimír Korda

Charles University Prague, Facultas Medica Hradec Králové: Dept. Ophthalmology

The aim of the project was to improve the presentation of the eye examination and treatment of anterior segment's diseases using the digital camera, that is fixed to the slit lamp, for the pregradual students at their practical lessons. For this purpose was bought the System of the type SL 1600 complet. This system enables to transport the record of the digital camera onto the monitor that is observed by the group of the students. In this way, the students can observe the examination and also the simple surgical treatments at the anterior eye segment (extraction of the foreign body, extraction of the corneal sutures). It is also possible to store the records, to show them to the students when the patients are absent and to make the complete picture collection. This system is very convenient first of all for the diferential diagnosis of the red eye's syndrome and in ocular traumatology. From our short experiences, this kind of patient's examination is very interesting for the students and it is a great contribution for the lectures and the practical lessons for pregraduate students.

Supported by Grant of Ministry of Education to DH No 2513/F3A/02.

Address for correspondence: Doc. MUDr. Dagmar Hejčmanová, CSc., Oční klinika FN, Sokolská 158, 500 05 Hradec Králové, e mail: hejčmanovad@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: 682000/2002

Summary of 2002 results

Title of the presentation: Effect of acute acidosis on protein and amino acid metabolism in rats

Authors: Roman Šafránek (1), Milan Holeček (1), Jana Kadlčíková (2), Luděk Šprongl (3), Jaroslav Chládek (4)

Dpt. Physiol. (1) and Pharmacol (4), Fac. Med. and Dpt. Pharmacol. and Toxicol., Fac. Pharmacy (2), Charles Univ., Hr. Králové, and Dpt. Biochem., Motol, Prague (3), Czech Rep.

Metabolic acidosis is a common finding in critical illness. The aim of the present study was to evaluate acute acidosis as a signal that induces changes in protein metabolism.

In the first study, Wistar rats were infused for 6 hours with HCl or saline resulting in blood pH 7.30 ± 0.03 and 7.46 ± 0.02 , respectively. The whole body protein metabolism was evaluated using L-[1-¹⁴C]leucine. In the second study, soleus and extensor digitorum longus muscles from normal rats were incubated in medium, pH 7.4, 7.3 or 7.0. Protein metabolism was evaluated using L-[1-¹⁴C]leucine and tyrosine release.

In the in vivo study we observed increased protein turnover – protein synthesis, proteolysis and leucine oxidation and more negative protein balance in rats with acidosis. There was no change in protein synthesis in gastrocnemius muscle. We observed an increase in plasma levels of most amino acids including branched-chain amino acids and a decrease in intracellular amino acid pool in skeletal muscle. In vitro decrease in pH of 0.1 had no effect on protein metabolism, decrease of 0.4 decreased protein turnover and leucine oxidation.

We conclude that protein wasting that is associated with acidosis is caused by complex neurohumoral regulations rather than by acidosis itself.

Supported by a grant No. 305/01/0578 of the Grant Agency of the Czech Republic.

Address for correspondence: Doc. MUDr. Milan Holeček, DrSc., Dpt. Physiol., Charles Univ. in Prague, Fac. Med. in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Rep.

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: 471000/2002

Summary of 2002 results

Title of the presentation: Acute Effects of Decreased Glutamine Supply on Protein and Amino Acid Metabolism in Hepatic Tissue. A Study Using Isolated Perfused Rat Liver.

Authors: Milan Holecek (1), Radana Rysava (1), Roman Safranek (1), Jana Kadlcikova (2)

Dpt. Physiol. Fac. Med. (1) and Dpt. Pharmacol. and Toxicol., Fac. Pharmacy (2), Charles Univ., Hradec Králové, Czech Republic

Glutamine deficiency has a negative influence on immune status, protein metabolism and disease outcome. In several studies, a close relationship between glutamine, branched-chain amino acid (BCAA) and protein metabolism was demonstrated. The aim of the present study was to investigate the effect of glutamine deficiency on amino acid and protein metabolism in hepatic tissue using a model of isolated perfused rat liver (IPRL). Parameters of protein metabolism and amino acid metabolism were measured using both recirculation and single pass technique with L-[1-14C]leucine and [1-14C]KIC as a tracer. Glutamine concentration in perfusion solution was 0.5 mM in control and 0 mM in the glutamine deficient group. The net release of glutamine (about 11 mmol/g/h) and higher net uptake of most of the amino acids was observed in the glutamine deficient group. There was an insignificant effect of lack of glutamine on hepatic protein synthesis, proteolysis and the release of urea. However, significantly lower release of proteins by the liver perfused with glutamine deficient solution was observed. The lack of glutamine in perfusion solution caused a significant decrease in leucine oxidation (6.66 ± 1.04 vs. 13.67 ± 2.38 , mmol/g dry liver/h, $P < 0.05$) and an increase in KIC oxidation (163.7 ± 16.5 vs. 92.0 ± 12.9 mmol/g dry liver/h, $P < 0.05$). We conclude that decreased delivery of glutamine to hepatic tissue activates glutamine synthesis, decreases resynthesis of essential BCAA from branched-chain keto acids (BCKA), increases catabolism of BCKA, and has an insignificant effect on protein turnover in hepatic tissue.

Supported by a grant No. NB 6793-3 of IGA MH of the Czech Republic.

Address for correspondence: Doc. MUDr. Milan Holeček, DrSc., Dpt. Physiol., Charles Univ. in Prague, Fac. Med. in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Rep.

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
Prospective Randomized Control Study

Grant Agency: IGA - MZ ČR

Project Number: NA 6767 - 3

Principal Researcher: Doc.MUDr.Petr Hůlek, CSc

Joint Researchers: Doc.MUDr.Antonin Krajina, CSc
Doc.MUDr.Pavel Eliáš CSc
MUDr.Miroslav Lojík
MUDr.Pavel Ryška
MUDr.Tomáš Vaňásek
MUDr.Antonín Michl
MUDr.Tomáš Fejfar

Starting date: 1.1.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 997

Summary of 2002 results

Title of the presentation: Intraparenchymally Inserted Stentgrafts for TIPS from ePTFE Significantly Reduce the Incidence of In-Stent Stenoses: a long-term prospective control trial in humans

Authors: Petr Hůlek, Antonín Krajina, Tomáš Fejfar, Miroslav Lojík, Tomáš Vaňásek, Pavel Ryška, Václav Šafka

PURPOSE: In a prospective non randomized control trial to compare occurrence of stenoses in general, particularly inside the stent and in the out-flow tract while using intraparenchymally covered and non covered stents.**MATERIALS AND METHODS:** Between October 97 to March 1999 twenty seven patients with recurrent variceal bleeding or with refractory ascites were treated with TIPS using expanded polytetrafluorethylene (ePTFE) covered stents (home made stentgrafts + spiral Z stents or Wallstents and Jostents). Patients in control group were treated with TIPS using bare stents (spiral Z stents and Wallstents). Group consisted of another 27 patients of the same age, Child-Pugh classification and etiology of cirrhosis. Follow-up was performed with duplex ultrasonography at discharge and then every 3 months up to February 2002.**RESULTS:** The implantation technical success rate was 100%. There were some technical difficulties in placement of stentgrafts in two patients. Mean HVPG was reduced from 19 (13 – 25] mmHg to 7 (2 – 18) mmHg. In ePTFE group revision in 14 patients was indicated. For in-stent stenosis in 4 cases and for outflow stenosis in 10 cases. In control group 26 patients underwent angioplasty for stenosis – in-stent stenosis in 19 cases, outflow stenosis in 7 patients.**CONCLUSION:** The use of ePTFE stentgrafts is technically possible and is associated with prolonged TIPS patency compared with bare stents, but associated with certain technical problems concerning the location of the graft. Statistically significant reduction of in-stent stenosis occurrence in ePTFE group (4/27 vs. 19/27) $p=0,01$ was found. There was no significant difference in occurrence of outflow stenoses between both groups (10/27 vs. 7/27). Intraparenchymal tract covering of the stent can solve development of in-stent but not outflow stent stenoses.

Address for correspondence: Petr Hůlek, Department of Internal Medicine, University Hospital, Hradec Kralove, 500 05 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:**

Analysis of volatile markers of metabolic processes

Authors: Hyšpler, R.(1), Tichá, A.(2), Gasparič, J.(1), Zadák, Z.(1)

1. Faculty of Medicine, Charles Univ., Hradec Králové, Dpt. of gerontology and metabolism
2. Faculty of Chemical Technology, University of Pardubice, Dpt. of analytical chemistry

Volatile compounds originating from the metabolic processes (e.g. synthesis of cholesterol, large bowel fermentation) have a special properties - quickly reflect the metabolic flux and frequent sampling from expired breath is possible. Their determination in blood is also necessary to describe compound partition from blood into expired breath.

The analytical methods for the determination of sulphide in whole blood and methane in expired breath were developed to monitor the fermentation of dietary fibre in the large bowel. Due to impossibility to find a suitable animal model for isoprene metabolism, a stable isotope study will be performed on patients during the following year.

Publications:

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 Chromatogr. B* 2002 770 (2):255-259.

Tichá, A., Hyšpler, R., Indrová, M., Zadák, Z.: „Kontinuální monitorování koncentrace methanu ve vydechaném vzduchu k hodnocení fermentovatelnosti vlákniny“.

XVIII. Vědecký kongres Společnosti klinické výživy a intenzivní metabolické péče ČLS JEP, Hradec Králové, 2002.

Tichá, A., Hyšpler, R., Indrová, M., Hyšplerová, L., Zadák, Z. : Stanovení sirovodíku v plné krvi extraktivní alkylací a GC-MS. *Pokroky v chromatografii a elektroforéze 2002*, Olomouc.

Tichá, A., Hyšpler, R., Zadák, Z., Indrová, M., Hyšplerová, L., Churáček, J., Gasparič, J.: Dietní vláknina a její vlivy na lidský organismus. *Klin. biochem. metab.*, 11 (32), 2003.

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: Biochemical markers of inflammation in the exhaled breath condensate of children with asthma

Grant Agency: Ministry of Health

Project Number: NL/7024-3

Principal Researcher: Jaroslav Chládek

Joint Researchers: Jaroslav Chládek, Jiřina Chládková, Tomáš Chyba, Jiřina Martínková, Petr Čáp, František Pehal

Starting date: 1.1. 2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 3200000

Summary of 2002 results

Title of the presentation: Leukotrienes (LT) and metabolites of nitric oxide (NO) in the exhaled breath condensate of healthy subjects and of patients with asthma

Authors: Jaroslav Chládek (1), Petr Čáp, František Pehal (2), Jiřina Chládková (3), Martin Hospodka, Jiřina Martínková (1).

Fac. Med., Charles Univ., Hr. Králové: Dept. of Pharmacology (1), Dept. of Pediatrics (3), Hospital Na Homolce, Prague (2).

There is increasing interest in using exhaled breath condensate (EBC) as a noninvasively collected fluid which reflects the composition of extracellular fluid mainly from central airways. In this study, a specific and sensitive gas chromatography method with mass-spectrometric detection was used for analysis of LTB₄, LTC₄, LTD₄ and LTE₄ in EBC samples from 100 healthy subjects (50 children) as well as from 61 patients (33 children) with mild to moderate stable asthma (AB) on regular pharmacotherapy with inhaled corticosteroids (ICS). Moreover, nitrites, nitrates and nitrotyrosin (NT) were measured as biomarkers of NO induction.

Concentrations of LT in EBC increased with age but were not influenced by gender. The median (25th to 75th percentiles) LT levels (pg/ml) were higher ($P < 0.001$) in healthy adults (LTB₄: 79 (72 - 90), LTD₄ 8.0 (5.0 - 12) and LTE₄ 75 (65 - 85)) compared to children by 14% to 21% for all LT except for LTD₄ (difference 62%). Median concentrations of exhaled LT were elevated in children with asthma compared with age-matched healthy controls: LTB₄ 1.6-fold, LTD₄ 3.6-fold, LTE₄ 1.3-fold and cys-LT 1.4-fold ($p < 0.00001$). In adult asthmatics, the increase in exhaled LT was even higher (LTB₄ 2.6-fold, LTD₄ 4.1-fold, LTE₄ 1.7-fold and cys-LT 2-fold, $p < 0.00001$). Likewise in controls, also in asthmatics were levels of LTC₄ frequently below 1 pg/ml. The mean (SD) concentrations of nitrates were approximately 2-fold higher in AB patients compared to controls [44.5 (23.7) vs 24.1 (15.1) umol/l, $P < 0.005$]. In contrast, concentrations of NT and nitrites were similar in both groups. Total protein was found in similar concentrations irrespective of age and disease status indicating the same extent of EBC dilution with exhaled water vapours. Conclusion: Biomarkers in EBC are a promising noninvasive direct method for monitoring of inflammation in the lungs.

Address for correspondence: Jaroslav Chládek, Dept. of Pharmacology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Republic.

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 Kholova

Joint Researchers: Ales Ryska, Marie Ludvikova, Jan Cap, Ivo Steiner, Lucie Barvirova

Starting date: 1.1.2000

Duration (years): 3

Funds allocated for project - total in Czech crowns: 125000

Summary of 2002 results

Title of the presentation: Dipeptidyl peptidase IV as a marker of neoplasia?

Authors: Ivana Kholova (1), Ales Ryska (1), Marie Ludvikova (3), Jan Cap (2)

Fac. Med., Charles Univ., Hr. Kralove: Fingerland Dept. of Pathology (1), Dept. of Internal Medicine (2), Fac. Med., Charles Univ., Plzen: Sikl's Dept. of Pathology (3)

The aim of the study was to evaluate the use of dipeptidyl peptidase IV (DPP IV) as a marker of thyroid neoplasia. DPP IV was assessed by three methods: cytochemically, and histochemically (both by azo-coupling) and immunohistochemically (using catalysed signal amplification). We studied thyroid lesions from 283 females and 53 males, aged 15-80 years. Additionally, thyroid peroxidase (TPO) was evaluated immunohistochemically in a group of 321 patients (269 females, 52 males, aged 18-79).

By cytochemistry, the sensitivity of DPP IV as a marker of thyroid neoplasia is 95%, the specificity 66%, and the diagnostic accuracy 70%. By histochemistry, the sensitivity is 73%, the specificity 84%, and the diagnostic accuracy 82%. Immunohistochemically, the sensitivity is 68%, the specificity 93%, and the diagnostic accuracy 90%, respectively.

DPP IV is useful in papillary carcinoma. On the other hand, in follicular lesions DPP IV is of no use. The sensitivity of TPO is 53% and the specificity 96%, respectively.

In conclusions, there is no marker of thyroid neoplasia generally accepted so far.

Address for correspondence: I.Kholova, Fingerland Dept. of Pathology, Faculty Hospital, CZ-500 05 Hradec Králové, Czech Republic, kholovai@lfhk.cuni.cz

Title of the research project: Interactive programs for teaching pharmacology

Grant Agency: Ministry of Education

Project Number: 2533/F3/02

Principal Researcher: Iva Krulichová

Joint Researchers: Jiřina Martínková

Starting date: 1. 1. 2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 110000

Summary of 2002 results

Title of the presentation: Interactive programs for teaching Pharmacology

Authors: Iva Krulichová (1), Jiřina Martínková (2)

Fac. Med., Charles Univ., Hradec Králové: Dept. of Medical Biophysics (1), Dept. of Pharmacology (2)

The aim of the project was to create two new case studies concerning anticoagulation treatment and treatment with antibiotics and to make a program, which would enable to present the case studies. For that purpose we have made a general frame - a database application, which enables to add new case studies without any other demands on programming. The program has two versions. A teacher's version enables the teacher to record his/her case studies into a database, a student's version enables the student to work with case studies. After choosing a case study the student is acquainted with a general description of the case. Then the student can, by way of selecting eligible questions from a given list, obtain information about a patient's condition and results of various examinations and laboratory tests. Thereafter the student can approach a final test. In the test the student gradually makes decisions about the way of treatment. The program enables branching of tests. In case that the student fails in an essential question, he/she is guided to a subsidiary branch, which simulates the situation after the wrong decision. Student's answers are automatically evaluated and after finishing the test the student gets a grade.

The program enables us to use various forms of documentation, figures demonstrating side effects and so on. It is also possible to link additional sources to the program, such as videorecordings, or presentations in PowerPoint.

The program enables us to put in case studies on different levels of difficulty from various medical branches.

The program with case studies may be used for teaching pharmacology, selfstudy, and postgraduate education of physicians.

Project was supported by Ministry of Education, No 2533/F3/2002.

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Title of the research project: Electrophysiological evaluation of age related changes in visual perception of man

Grant Agency: Czech Republic

Project Number: 309/02/1134

Principal Researcher: Miroslav Kuba

Joint Researchers: Zuzana Kubová, Jan Kremláček, František Vít, Jana Szanyi, David Gayer, Jana Chlubnová

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1 038,000.-

Summary of 2002 results

Title of the presentation: Age-related norms for visual evoked potentials

Authors: Miroslav Kuba, Jana Chlubnová, Jan Kremláček, Jana Szanyi, Zuzana Kubová, František Vít

Charles University-Faculty of Medicine in Hradec Králové, CZ: Dept. of Pathophysiology

The first part of our project focused to ageing of the human visual system was oriented to searching for normal parameters of the enlarged set of visual evoked potentials (VEPs) used in our Electrophysiological Lab. It includes flash, pattern-reversal, motion-onset and cognitive VEPs (for demonstration see <http://www.lfhk.cuni.cz/elf>) and provides information about function of the visual pathway from the retinal level over the primary striate cortical area, extrastriate associate visual areas in the temporal cortex up to the higher centro- parietal areas specialised for cognitive processes. These visual stimuli were produced on the 21" computer monitor with the use of Visual Stimulus Generator 2/5 (Cambridge Research System, UK).

Six unipolar recordings of VEPs from Oz, Ol, Or, Pz, Cz and Fz (with earlobe reference) provide sufficient data for routine evaluation of visual information processing at the specified levels of the visual pathway. The combination of visual stimuli oriented toward activation of both parvocellular and magnocellular systems and of higher-order cognitive areas seems to be very useful tool for the task being solved in this project.

Acquired data so far indicate the closest correlation of age and the latency of the motion-onset VEPs (its prolongation toward elderly). This is in good agreement with hypothesis that the magnocellular system is more sensitive to the ageing process.

Supported by Grant Agency of the Czech Republic (grant No. 309/02/1134).

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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): 4

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

Summary of 2002 results

Title of the presentation: New variants of visually evoked cognitive evoked potentials

Authors: Miroslav Kuba, Jan Kremláček, Zuzana Kubová, Jana Szanyi, Jana Chlubnová, František Vít

Charles University in Prague, Faculty of Medicine in Hradec Králové, CZ: Department of Pathophysiology

For our electrophysiological testing of human cognitive processes, new visual stimuli with cognitive tasks applicable in large spectrum of subjects were developed (with relatively constant responses irrespective of sex, age and IQ). The oddball paradigm was used for obtaining of target/non-target responses to discrimination of non-coherent/coherent motion, letters/digits and lexical differences (for demonstration see <http://www.lfhk.cuni.cz/elf>). We succeeded to reduce inter- and intra- individual variability of visually evoked P300 and to eliminate contamination of cognitive potentials by motor activity. No motor action of subjects is required to signalize target stimuli (alertness and motivation of subjects is accomplished through continuous checking of the perceived information - e.g. via counting of presented digits).

We try to verify a practical (clinical) applicability of the developed set of stimuli and the way of examination of the CNS cognitive functions. Besides various groups of psychiatric patients, we also started to test groups of disabled children (dyslexics and hearing deficits using the sign language) and a decline of cognitive functions in elderly.

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

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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, 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 2002 results

Title of the presentation: Other factors to consider when choosing the DDD pacing mode

Authors: Měšťan M (1), Kvasnička J (1), Tauchman M (2), Tušl Z (2), Rejchrt P (2), Střítecký J (2), Babu A (1)

Faculty of Medicine, Charles University, Hradec Králové: Dep. of Internal Medicine (1), Faculty Hospital, Hradec Králové: 1st Dep. of Internal Medicine (2)

Background: It is not well known which patients profit most from the DDD mode of pacing. Patients and methods: 22 patients with DDDR pacemakers were enrolled into a cross-over, randomized study during which DDDR and VVIR modes were tested over 14 day periods. Presence of treated arterial hypertension (AH), coronary heart disease (CHD) and other factors on quality of life (QOL) in either mode were quantified by a questionnaire. The impact of atrial contribution (AC), the exercise lever achieved during bicycle ergometry and the double product at maximal exercise (DP) were tested.

Results: QOL score was significantly better in DDDR than in the VVIR mode ($P < 0,005$). The DP was not influenced by the pacing mode (VVIR 19488 ± 6264 , DDDR 19702 ± 5783), no relation was found between AC and DP ($r^2 = 0,173$). Presence of AH significantly contributed to intolerance of VVIR mode (QOL score with and without AH – part A, $P < 0,005$; part B $P < 0,01$). CHD and type of arrhythmia did not influence the subjective preference of pacing mode. Week positive relationship exists between AC and age.

Conclusions: DDDR is superior to VVIR mode as far as the QOL is concerned but does not improve the DP. Presence of treated AH is important for the proper choice of the pacing mode. The magnitude of atrial contribution to systolic volume is not decisive in the process of selection of pacing mode, but can help to establish optimal AV delay.

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Title of the research project: Ophthalmology at Medical faculty of Karls-Eberhardt University in Tuebingen - SRN

Grant Agency: Ministry of Education

Project Number: 2534/F3E/02

Principal Researcher: Hana Langrová

Joint Researchers: Dagmar Hejcmanová, Pavel Rozsival

Starting date: 2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 42000

Summary of 2002 results

Title of the presentation: Ophthalmology at Medical faculty of Karls-Eberhardt University in Tuebingen - SRN

Authors: Hana Langrová, Dagmar Hejcmanová, Pavel Rozsival

Charles University Prague, Facultas Medica Hradec Králové: Dept. Ophthalmology

The solver of the project took part in lectures and practical lessons in ophthalmology for pregradual students at Medical faculty of Karls-Eberhardt University in Tuebingen, Germany. The aim of the one month stay was to compare the lessons in ophthalmology on both Universities from various point of view and to propose the changes at our faculty according to the differencies.

The german students have 12.5 hours of lectures and 6.5 hours of practical lessons in ophthalmology more than students at Medical faculty in Hradec Králové. Moreover the lessons in ophthalmology in Tuebingen take place in three consequent years, so the students must revise their knowledge at least two times and it has positive influence on the long-term keeping of their knowledge in their mind. On the other hand the intensive blocks of practical lessons at our faculty increase the interest of the students in ophthalmology as they make their oral examination immediately after these blocks. No significant differencies were found between two faculties neither in theoretical knowledges and practical skills of the students nor in quality of the lessons. There are more instruments and better didactic technique in Tuebingen. But the SL 1600 complet system that was bought for our students improves the demonstration of the examination and the treatment of anterior segment of the eye for the students so that the quality of the didactic technique is comparable nowadays. The german students make multiple choice test at the end of lessons in ophthalmology. The combination of the oral examination and the multiple choice test is proposed for the students at Medical faculty in Hradec Králové.

Supported by Grant of Ministry of Education No 2534/F3E/02.

Address for correspondence: MUDr. Hana Langrová, Ph. D, Oční klinika FN, Sokolská 158, 500 05 Hradec Králové, e mail: langrovah@lfhk.cuni.cz

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

Grant Agency: Czech Republic

Project Number: 309/00/D056

Principal Researcher: Hana Langrová

Joint Researchers: Dagmar Hejcmanová

Starting date: 1.9.2000

Duration (years): 3

Funds allocated for project - total in Czech crowns: 707000

Summary of 2002 results

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

Authors: Hana Langrová, Dagmar Hejcmanová, Lisa Bytton-Diaz, Marcela Hovorková, Alena Feuermannová, Pavel Rozsival

Charles University Prague, Facultas Medica Hradec Králové: Dept. Ophthalmology

The aim of the project is 1. to objectify and quantify subjective complaints in conditions of lower contrasts and under glare a) in patients with an 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 implantation of phakic intraocular lenses for correction of the refractive error. The examinations of patients with early cataract preoperatively and after cataract surgery were finished (n=53). The statistical evaluation of the results was continued. The significant improvement of the best corrected visual acuity and contrast sensitivity without glare and under glare in 20 arterphakic patients after YAG capsulotomy because of secondary cataract was observed and the manuscript published in Cesk and Slov Ophthalmology. The significant improvement of the best corrected visual acuity and contrast sensitivity in all frequencies tested in 20 myopes 6 months after implantation of phakic intraocular lenses was observed. The glare had only nonsignificant influence on both visual acuity and contrast sensitivity. The manuscript was submitted for publication in Cesk and Slov Ophthalmology.

Supported by Grant of Czech Republic No. 309/00/D056.

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Title of the research project: Modernization of instruction in the physiology of respiratory system

Grant Agency: Ministry of Education

Project Number: 2515/F3/02

Principal Researcher: Halka Lotková

Joint Researchers: Zuzana Červinková, Michaela Adamcová

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 131000

Summary of 2002 results

Title of the presentation: Modernization of instruction in the physiology of respiratory system

Authors: Halka Lotková

Faculty of Medicine, Charles University, Hradec Králové: Dept. of Physiology

Laboratory classes in the respiratory system are focused on the measurement of ventilatory functions. This measurement using modern spirometers allows to calculate automatically a large range of ventilatory indices, store patient results, provide a print - out of the results. A spirometer that provide graphic display of the manoeuvres can help to understand better the principles of this examination. Exercise testing performed in laboratory class gives an information about the response of cardiovascular system to the extra demands of physical activity. To obtain more detailed knowledge about the adaptation of the body to exercise, the spirometric measurement should extend this laboratory class. The measurement of basal metabolic rate in practical class can be calculated from oxygen consumption using spirometer. Therefore we use spirometer MasterScope Jaeger Toennies for: 1) the measurement of ventilatory functions, 2) the testing of cardiovascular and ventilatory adaptation to exercise and 3) the measurement of basal metabolic rate in human beings. MasterScope unit is connected with computer and equipped with LAB software. Before a patient can be recorded the measurement system must be calibrated and ambient conditions have to be entered for the determination of important correction factors.

Ad 1) Slow and forced breathing manoeuvres as well as the measurement of the maximum voluntary ventilation can be performed. The recording curves are displayed on the screen and the results are calculated automatically. This data can be output at the printer.

Ad 2) Exercise testing using 2 W/kg load is performed for 5 minutes. The changes of cardiovascular parameters, tidal volume and frequency of breathing are measured.

Ad3) The metabolic rate is calculated from the measurement of oxygen consumption.

Project was supported by the Ministry of Education, No. 2515/F3/02.

Address for correspondence: H. Lotková, Dept. of Physiology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Republic

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

Grant Agency: Ministry of Education

Project Number: CEZ:13/98.1

Principal Researcher: Jaroslav Malý

Joint Researchers: Jan Peychl, 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, Pavel Žák, Miroslav Kmoníček, Ladislav Jebavý

Starting date: 1.1.1999

Duration (years): 4

Funds allocated for project - total in Czech crowns: 1702000

Summary of 2002 results

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

Authors: Jaroslav Malý (4), Jan Peychl (1), Emil Rudolf (1), Miroslav Červinka (1), Zdeněk Fiedler (1), Vladimír Geršl (2), Michaela Adamcová (2), Milan Rešl (3), Pavel Jandík (5), Zbyněk Vobořil (5), Jan Bureš (4), Marcela Kopáčová (4), Jiří Horáček (4), Alice Poznarová (4), Martin Blažek (4), Bohuslav Melichar (4), Pavlína Králíčková (4), Pavel Žák (4), Miroslav Kmoníček (4), Ladislav Jebavý (4),

Fac. Med. Charles Univ. Hr. Králové: Dept.of Med. Biology and Genetics (1), Dept. of Pharmacology (2), Dept. of Pathology (3), Dept. of Medicine (4), Dept. of Surgery. (5)

We evaluated the results on the field of the carcinoma cell lines, cardiotoxicity and nephrotoxicity of cytostatics, effect of topoisomerase for diagnostic criteria of atypical carcinoids, hemostatic changes during stem cell transplantation and results of non myeloablative transplantation regimen. Migration and invasiveness of stabilized cell lines JUN-1, JUN-2 a JUN-3 was investigated by means of wound healing assay and Matrigel invasion assay. The results showed that unlike JUN-1 and JUN-3 lines, JUN-2 line showed the least migration and invasion capabilities. Pyridoxal isonicotinoyl hydrazone (PIH) is a new tridentate Fe-chelating agent, that should be very promising in many pathological states resulting from both the iron-overload and the formation of free radicals. Our results showed that the effect of PIH combined with daunorubicin significantly depends on the PIH dose. The choose of the most suitable scheme deserves further studies. In 2002, the aim of the project has been focused on comparison of the obtained results, i.e., proliferate activity measured by topoisomerase II alpha in pulmonary carcinoids with similar affections in different organ system. Six primary ovarian carcinoids with different clinical outcome and histogenetic origin was examined immunohistochemically. We investigated Helicobacter pylori status (by means of 13C-urea breath test), electrogastrography (both in fasting and postprandial phase) and gastric emptying using 13C-octanoic acid breath test. Thus we have done 21 assays in three patients All tests were quite normal in one patient and borderline in another one (before chemotherapy was started). In one patient a severe postprandial .tachygastria was found.

Address for correspondence: J. Malý, Dept. of Medicine, Charles Univ. in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 01 Hradec Králové, Czech Rep.

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: Pavel Živný, Vladimír Lonský, Vladimír Palička, Pavel Kuneš, Jaroslav Kubíček

Starting date: 1.1.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1592000

Summary of 2002 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

Authors: Jiří Mandáček (1), Pavel Živný (2), Vladimír Lonský (1), Vladimír Palička (2), Pavel Kuneš (1), Jaroslav Kubíček (1)

Charles University Hospital, Hradec Králové, Czech Republic: Dept.Cardiac Surgery (1), Inst.Clinical Biochemistry (2)

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 monitoring of metabolism and interstitial blood flow in peripheral tissue (skeletal muscle) during cardiac surgery, CPB and postoperative care by interstitial microdialysis. 40 patients operated using CPB, 20 in normothermic (NT), vs. 20 in hypothermic (HT) CPB were enrolled to this study. Microdialysis was performed by 2 special probes inserted into the patient's m.deltoideus. Samples were collected in intervals. Estimations in obtained dialysates were glucose, urea and lactate. The tissue blood flow was monitored by original dynamic microdialysis with gentamycine as a marker.

There were similar time-depending changes in dialysates of all analytes during operation in both groups (NT vs.HT). Low initial concentrations were followed with successive increase of these concentrations. Transient decrease of concentration of above-mentioned analytes were found after operation, increase later in postoperative time. Lactate and urea muscle interstitial concentrations during CPB were not significantly higher in NT group in comparison with HT group. Changes of concentrations of gentamicine indicated lower perfusion of peripheral tissue during CPB, markedly HT CPB. These metabolic changes in skeletal muscle are influenced not only by blood tissue flow and tissue metabolic activity but by dramatic changes in tissue perfusion, interstitial hydrostatic pressure (capillary fluid pressure) and osmotic changes (osmolality) during CPB.

This study continues and is supported by Grant No.6547-3 of IGA Czech Ministry of Health.

Address for correspondence: J. Mandáček MD,PhD, Dept.Cardiac Surgery, Charles University Hospital, 50005 Hradec Králové, Czech Republic

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, doc. PhDr. Tomáš Svatoš, mgr. Edita Ondřejová, PhDr. L. Troneček, MUDr. Romana Ivančáková

Starting date: 1.1.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1088

Summary of 2002 results

Title of the presentation: Social Support among Children and Adolescents in Stressful Situations (Psychosocial Perspective)

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

1. A review study of positive effects of social support was made. A review of the contemporary knowledge of help seeking by healthy and ill children and adults as well as granting special form of social support called mentoring was elaborated. 2. A review of negative aspects of social support. 3. Attention was given to discovering special kinds and forms of social support badly needed by children and adults in coping with stress of different illnesses and especially painful medical treatments. 4. The present state of social support granted to children and adults in stressful life situations was studied. First of all 600 the elementary school children were asked with the use of a CASS questionnaire about the sources, kinds and forms of their social support granted to them by other people. Another study concerned 1176 children of elementary and middle schools and students of professional schools who were given the SSQ6 questionnaire diagnosing accepted social support from different sources. 5. Four new diagnostic methods were created and 5 other foreign diagnostic methods were translated and tested. 6. A research concerning social support of the parents of ill children and nurses caring for these ill children was made. Main task of this research was to see how the parents and nurses cope with this social role of caring agents of children and adolescents in very dangerous health situations. 7. Altogether 479 drawings and written answers of 124 ill children at the hemato-oncologic ward concerning their perception of social support were collected and conserved in the form of a CD ROM.

Publications: One edited book and one handbook were published, as well as 9 journal articles and 27 articles in reviewed edited books. 30 lectures at different congresses (inclusive 7 lectures in foreign countries) were given.

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, Martina Sutnarová, Ondřej Renc, Monika Říhová

Starting date: 1.1.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 750000

Summary of 2002 results

Title of the presentation: Some clinical and laboratory aspects of CDG screening in children and adults

Authors: Eliška Marklová, Ziad Albahri, Jaroslava Vávrová*; Dept. of Pediatrics and *Dept. of Clin. Biochem., Charles Univ. in Prague, Fac. Med. and Teaching Hosp. in Hradec Králové

Clinical presentation of congenital disorders of glycosylation (CDG) appears more typical and severe symptoms in infancy and childhood, than in adults. In some cases, the neurological involvement has been referred to be only mild without any hallmark symptoms. Recently we have introduced a common screening method, based on isoelectric focussing of transferrin (TF) in serum. While looking for subjects with typical symptoms of the disease we have also focused on several groups of patients with isolated signs, e.g. those with pigmentary retinal degeneration, permanent strabismus, rapid skin ageing or any neurological impairment, combined with abnormal either thyroid parameters, clotting factors or liver tests, considering less pronounced clinical expression in some subjects. Over 120 healthy individuals of various ages and 480 children/adults with a possible congenital metabolic defect have been examined. Serum of alcohol abusers and patients with hepatopathy served as pathological reference samples, due to secondary defects of glycosylation as consequence. Together with screening of CDG we paid attention to recognition and differentiation of genetic variants of TF (B, C, D), also under use of neuraminidase digestion. In our set of subjects we have found in about 15 % the heterozygous TF-C1/C2 form, present more frequently in females, the incidence being even much higher in the Crohn's disease and the cystic fibrosis patient groups. Appearance of altered isoelectrofocussing patterns has been combined with Hashimoto thyreoiditis, epilepsy and some non-specific seizures. False positive results, that means an (transient) increase of hyposialo-isoforms, was found in newborns, in several patients with hepatopathy, and in samples of heparin- or EDTA-treated blood.

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, Czech Republic.

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 2002 results

Title of the presentation: Modelling of low dose methotrexate pharmacokinetics (PK) and pharmacodynamics (PD) in therapy of severe psoriasis.

Authors: J. Grim, J. Chládek, J. Martínková (1), M. Šimková, J. Vaněčková, V. Koudelková, M. Nožičková (2),

Fac. Med., Charles Univ., Hr. Králové, Dept. of Pharmacology (1), Dept. of Dermatology (2),

Aim. The aim of a 13-week, randomized, parallel-group study was to evaluate the relationship between pharmacokinetics (PK) and pharmacodynamics (PD) of low-dose intermittent oral methotrexate (LDMTX) in the systemic antipsoriatic therapy.

Methods. Twenty-four psoriatic patients (15 male and 9 female, aged 31-73 years) were assigned to MTX doses of either 7.5 mg or 15 mg given once a week with the dose divided into 3 aliquots given at 12-h intervals. Pharmacokinetics of MTX were evaluated at weeks 1 and 13. The skin impairment was assessed using the PASI-scoring system (The Psoriasis Area and Severity Index) at baseline and at weeks 5, 9 and 13 of the therapy as were the hematological and biochemistry tests. **Results.** As assessed using the areas under the plasma concentration-time curve (AUCMTX) after the first and third weekly doses, the extent of MTX accumulation in plasma was 12%. There was no effect of the week of therapy on AUCMTX ($p > 0.8$). The intra-individual variability in the AUCMTX was at least 4-fold less than the inter-individual variability (F-test; $p < 0.01$). The steady-state total plasma clearance of MTX ranged from 5.0 to 18.2 L/h and was proportional to the renal clearance ($r^2 = 0.45$, $p < 0.001$) which accounted for $65 \pm 20\%$ of the former. PK/PD analysis revealed a highly significant inverse relationship between PASI (in % of the initial status) and a steady-state AUCMTX ($\rho = -0.65$, $p < 0.001$). Thirteen of 14 subjects with $\text{AUC}_{24-36h} \geq 700$ nmol.h/L responded to pharmacotherapy. Conversely, only 4 out of 10 subjects with $\text{AUC}_{24-36h} < 700$ nmol.h/L were responders ($p < 0.01$, Fisher's exact test). **Conclusion.** Due to the concentration-effect relationship and the considerable inter-individual variability in PK, therapeutic drug monitoring of LDMTX is mandatory.

Published in Br. J. Clin. Pharmacol. 2002; 54:147-156.

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

Title of the research project: Prediction of metabolic drug-drug interactions based on in vitro experiments.

Grant Agency: COST

Project Number: B15.30

Principal Researcher: Jiřina Martínková

Joint Researchers: Stanislav Mičuda, Jolana Cermanová, Jaroslav Chládek, Lucie Mundlová

Starting date: 1.1.2000

Duration (years): 4

Funds allocated for project - total in Czech crowns: 900000

Summary of 2002 results

Title of the presentation: Interaction of memantine with human liver microsomal cytochrome P450: Inhibition of CYP2D6.

Authors: Mičuda S, Mundlová L, Chládek J, Cermanová J, Martínková J.

Memantine is an uncompetitive N-methyl-D-aspartate (NMDA) receptor antagonist with therapeutic potential in dementia, spasticity and Parkinson's disease. This compound is predominantly excreted unchanged via the kidneys. Nevertheless, 10% to 25% of administered dose is excreted into bile, with 1% being metabolized to hydroxy metabolite. Therefore, potential for drug-drug interactions at the level of hepatic metabolism exists. This study was undertaken to examine the effects of memantine on several drug metabolizing CYP enzymes found in the liver. Pooled human liver microsomes were co-incubated with memantine and probe substrates for CYP1A2 (ethoxyresorufin), CYP2A6 (coumarin), CYP2D6 (dextromethorphan), CYP2E1 (chlorzoxazone), and CYP3A4 (nifedipine). The formation of CYP-specific metabolites following co-incubation with various memantine concentrations was determined to establish IC₅₀ and K_i values for these enzymes. While memantine did not inhibit CYP1A2, CYP2A6, CYP2E1, and CYP3A4 activities at concentrations below 500 microM, this compound inhibited CYP2D6 with IC₅₀ value of 237 microM. In conclusion, these results indicate that, although memantine can inhibit CYP2D6 catalytic activity, it would not be expected to cause any significant interactions with others CYP-metabolized drugs at clinically relevant concentrations achieved during long-term therapy.

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

Address for correspondence: Stanislav Mičuda, MD. PhD., Department of Pharmacology, Faculty of Medicine in Hradec Králové, Šimkova 870, PO Box 38, 500 38 Hradec Králové, Czech Republic

Title of the research project: Innovation of teaching materials from pharmacology.

Grant Agency: FRVŠ

Project Number: 2516/F3/02

Principal Researcher: Stanislav Mičuda

Joint Researchers: Jolana Cermanová, Jaroslav Chládek, Jiřina Martínková

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 92000

Summary of 2002 results

Title of the presentation: Innovation of teaching materials from pharmacology.

Authors: Mičuda S, Cermanová J, Chládek J, Martínková J.

This work was aimed at elaboration of teaching materials designed for intelligible training of medical students during practical classes from pharmacology. Because active contribution of students is supposed to be basic condition for effective teaching, we focused on utilization of interactive PC programs, practical demonstration of drug delivery systems, and active solution of situations from clinical pharmacokinetics. As a consequence, four topics have been prepared: a) Sources of information in pharmacology, b) Practical realization of treatment of diabetes mellitus, c) Pharmacologic analysis of influence of different compounds on bronchial smooth muscle, d) Solution of problems from clinical pharmacokinetics. All these materials are freely available at the Internet homepage of our department: <http://www.lfhk.cuni.cz/farmakol/predn/predncz.htm>.

This study is supported by the grant from the Ministry of Education (FRVS No. 2516/F3/02).

Address for correspondence: Stanislav Mičuda, MD. PhD., Department of Pharmacology, Faculty of Medicine in Hradec Králové, Šimkova 870, PO Box 38, 500 38 Hradec Králové, Czech Republic

Title of the research project: Evaluation of changes in expression of MRP2 on canalicular membranes of hepatocytes and their influence on hepatic elimination of methotrexate.

Grant Agency: GAUK

Project Number: 89/2002/C

Principal Researcher: Stanislav Mičuda

Joint Researchers: Jolana Cermanová, Jaroslav Chládek, Lucie Mundlová

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 254000

Summary of 2002 results

Title of the presentation: Evaluation of changes in expression of MRP2 on canalicular membranes of hepatocytes and their influence on hepatic elimination of methotrexate.

Authors: Mičuda S, Cermanová J, Mundlová L, Chládek J, Martínková J.

The multidrug resistance protein 2 (MRP2) mediates the biliary secretion of conjugates of lipophilic substances with glutathione, glucuronate, or sulfate across the canalicular membrane into bile. Into its prototype substrates belongs also methotrexate (MTX), which hepatic elimination could form as much as 30 % of administered dose. Changes in expression of MRP2 have been reported during administration of dexamethasone. Because MTX and dexamethasone could be applied together, potential for drug-drug interaction exists. The aim of presented study is to evaluate the influence of dexamethasone on the expression of MRP2, and consequently on biliary excretion of MTX. Using Western blot analyses of MRP2, our results confirmed that continual administration of dexamethasone (1 mg/kg p.o. in olive oil) to male rats over 4-days period lead to a significant increase in MRP2 expression. Possible influence on MTX biliary excretion will be examined using isolated perfused rat livers.

This study is supported by the grant from the Grant Agency of the Charles University in Prague (GAUK No. 89/2002/C/LFHK).

Address for correspondence: Stanislav Mičuda, MD. PhD., Department of Pharmacology, Faculty of Medicine in Hradec Králové, Šimkova 870, PO Box 38, 500 38 Hradec Králové, Czech Republic

Title of the research project: Establishment and exploitation of human hepatocyte culture systems for the in vitro evaluation of drug metabolism

Grant Agency: COST

Project Number: OC B15.40

Principal Researcher: Jaroslav Mokřý

Joint Researchers: Jana Karbanová, Jiřina Martínková, Stanislav Mičuda, Lucie Mundlová, Jaroslav Chládek

Starting date: 1.1.2002

Duration (years): 2

Funds allocated for project - total in Czech crowns: 1271000

Summary of 2002 results

Title of the presentation: Establishment of methods for the in vitro evaluation of drug metabolism

Authors: Jaroslav Mokřý (1), Stanislav Mičuda (2), Jana Karbanová (1), Jiřina Martínková (2), Lucie Mundlová (2), Jaroslav Chládek (2)

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

The initial phase of the project was aimed at introduction of new methods necessary for reaching the ultimate goals of the project.

To permit analysis of expression of hepatic drug and bile acid transporters, we established Western blotting of multi-drug resistance associated protein MRP2 and multi-drug resistance protein MDR1. The digital images received after exposure of the sensitive film were quantified with the use of the software ElfoMan 2.0.

Analytical methods introduced for assessment of activity of cytochrome P450 isoforms include O-deethylation of etoxyresorufin - EROD (CYP1A2), 7-hydroxylation of coumarine - COH (CYP2A6) and dextrometorfan O-demethylation (CYP2D6). Methods are based on incubation of substrate with hepatocytes and assessment of metabolites produced in the course of subsequent reactions.

At the same time we prepared conditions for cultivation of WRL68 and their in vitro differentiation of their progeny. We adopted technique of isolation, long-term cultivation and morphological examination including immunophenotypisation of fetal murine hepatocytes. In separate experiments we examined possibility of conversion of tissue-specific stem cells into endodermal cells.

Project was supported by the COST grant No. OC B15.40.

Address for correspondence: Doc. MUDr. Jaroslav Mokřý, Ph.D., Department of Histology and Embryology, Charles University Medical Faculty, Šimkova 870, 500 38 Hradec Králové

Title of the research project: Innovation of topics "Lymphatic system" and "Hemopoiesis"

Grant Agency: Ministry of Education

Project Number: 2517/F3

Principal Researcher: Jaroslav Mokrý

Joint Researchers: Stanislav Filip

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 165000

Summary of 2002 results

Title of the presentation: Lymphocyte system and hemopoiesis: Innovation of lectures and laboratory classes from histology

Authors: Jaroslav Mokrý (1), Stanislav Filip (1, 2)

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

Lectures and programmes for laboratory classes covering the themes of "Lymphatic system" and "Hemopoiesis" were supplemented with new pieces of knowledge, colored versions of 3-D reconstructions, digitalized images of lymphatic organs and prepared as Power Point presentations. New histological sections of human and mouse thymus, spleen, lymph node, tonsils and bone marrow were cut and processed for routine staining and peroxidase immunohistochemistry. The latter detections were focused on proliferation markers (PCNA, Ki-67), lymphocyte markers (CD3, CD20), macrophages (CD68, HLA-DR), dendritic cells (S100, CD1a), endothelial cells (vWF, CD31, CD34, vimentin, nestin) muscular markers (desmin, SMA) etc. Immunoreactive structures were photographed and used to prepare the database of digitalized images as well as lectures and laboratory classes. Immunostained sections were inserted in sets (boxes) of slides used by teachers and students.

Supported by the grant from Ministry of Education No. 2517/F3/2002.

Address for correspondence: Doc. MUDr. Jaroslav Mokrý, Ph.D., Department of Histology and Embryology, Charles University Medical Faculty, Šimkova 870, 500 38 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: 1.1.2000

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1465000

Summary of 2002 results

Title of the presentation: Differentiation potential of neural stem cells

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

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

The aim of the project was to determine whether neural stem cells (NSCs) were able to produce non neural cell types. NSCs were isolated from E14-15 fetal mouse brain or from the subependymal zone of adult mice using the neurosphere assay. To permit unambiguous identification of donor cells, NSCs tagged with bacterial beta-galactosidase or green fluorescein protein were used in subsequent experiments. 1) NSCs grown in the differentiation assay yielded beta-III tubulin+ neurons, GFAP+ astrocytes, O4+ oligodendrocytes and ciliated ependymocytes. 2) Following neural grafting, NSCs gave rise to neuronal and astroglial cells. 3) When grown in low density cultures, some SMA+ and desmin+ cells appeared among neural progeny. 4) After intravenous administration to sublethally irradiated mice, NSCs supported hemopoiesis. Labelled cells were observed within the medulla as well as the thymus of treated animals. 5) When we co-cultivated NSCs with ES cells and allowed them to form chimeric embryoid bodies (EBs), progeny derived from NSCs was identified among blood, endothelial and mesenchymal cells. Most cells adopted phenotypes of alpha-fetoprotein+ endodermal cells; some SMA+ cells were also detected in EBs.

Our results clearly demonstrate that spontaneous differentiation potential of NSCs includes neuronal, astroglial, oligodendroglial and ependymal cells. However, following appropriate stimulation, NSCs can generate a variety of non-neural phenotypes.

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 38 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 2002 results

Title of the presentation: Nestin expression in normal and neoplastic tissues

Authors: Jaroslav Mokrý (1), Jana Karbanová (1), Dana Duspivová (1), Jiří Ehrmann (2), Zdeněk Kolář (2)

Fac. Med., Charles Univ., Hr. Králové: Dept. of Histology and Embryology (1), Fac. Med., Purkinje Univ., Olomouc: Dept. of Pathology (2)

Intermediate filament (IF) nestin is temporarily expressed in sporadic cell types (incl. endothelial neural and myogenic cells) during certain phases of their development; following terminal differentiation, nestin is replaced with another IF. Our previous findings have shown that nestin expression is associated with angiogenesis of extraembryonic as well as intraembryonic structures. Recently we detected nestin in endothelium produced in response to physiological angiogenesis in the ovarian corpus luteum and placental chorionic villi. When we studied nestin expression in early blood vessels produced in the course of vasculogenesis, we found out that endothelial cells were devoid of nestin immunoreactivity, which might indicate that molecular regulation of angiogenesis differed vasculogenesis (Karbanová and Mokrý, Acta Histochem 104, 2002). Our studies of skeletal muscle grafts confirmed a loss of immunoreactivity for nestin as a consequence of differentiation of skeletal muscle fibres. Moreover we noticed a phenomenon of lateralisation of nestin distribution in muscle fibres in the vicinity to the motor plate that is visible in maturing as well as fully matured muscles. In samples taken from 70 human astrocytomas, high-grade astrocytomas (n=40; diagnosed according to WHO criteria) revealed significantly increased nestin immunoreactivity (histoscore: 2.9) than low-grade astrocytomas (n=30; histoscore: 1.6). Detection of nestin in newly formed blood vessels supplying the tumours is of no significance for tumour classification. An intense nestin-immunopositivity was observed in endothelial cells and pericytes of capillary hemangiomas, whereas cavernous hemangiomas were immunonegative. The finding might indicate different origins of both neoplasias.

Project was supported by the grant No. 6727-3/01 from IGA MZ.

Address for correspondence: Doc. MUDr. Jaroslav Mokrý, Ph.D., Department of Histology and Embryology, Charles University Medical Faculty, Šimkova 870, 500 38 Hradec Králové

Title of the research project: Reactive oxygen species in the 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, Dagmar Solichová, Radomír Hyšpler, Luboš Sobotka, Jan Maňák, Milan Kaška

Starting date: 1.1.2000

Duration (years): 3

Funds allocated for project - total in Czech crowns: 417000

Summary of 2002 results

Title of the presentation: Reactive oxygen species in the pathogenesis of acute pancreatitis - clinical trial

Authors: František Musil (1), Zdeněk Zadák (1), Dagmar Solichová (1), Radomír Hyšpler (1), Milan Kaška (2) Fac. Med. Charles Univ., Hr. Králové: Dept. of Gerontology and metabolic care (1), Dept. of Surgery (2)

Objective: The aim of this clinical trial is to compare the dynamics of antioxidants levels and the dynamics of reactive oxygen species (ROS) activity in patients with acute pancreatitis (AP) with group of patients operated on gastrointestinal cancer (CA) and with group of healthy controls.

Methods: Blood samples from a group of 21 patients with AP were analysed on admission, the 4th and the 8th day of hospitalization. Samples from a group of 14 patients admitted to hospital for elective laparotomy - resection of intestine for nongeneralised CA were analysed before operation, on the 1st, the 4th and the 8th day after operation. Samples from a group of 17 healthy persons were analysed. We investigated these parameters: selenium in plasma, red cell and big toe nail, vitamin A in plasma, α -tocopherol in plasma and in red cell, vitamin C and beta-carotene in plasma, thiobarbituric acid reactive substances in plasma – TBA-RS, conjugated linoleic acids (CLAs) in red cell membrane, activity of superoxide dismutase (SOD) and glutathione peroxidase (GSHPx) in red cell.

Results: Concentrations of plasma selenium, vitamin A and vitamin C were significantly lower in both groups of patients than in healthy controls. The red cell CLAs was significantly higher in patients with AP and in patients with CA than in healthy controls as marker of increased ROS activity.

Conclusions: We showed increased consumption of measured antioxidants in the course of AP due to increased activity of ROS. In comparison of patients with AP to patients with gastrointestinal CA, the levels of antioxidants in blood are similar. Patients with AP should be supplemented with antioxidants in the course of AP. Similarly, patients with gastrointestinal CA should be perioperatively supplemented with antioxidants.

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

Grant Agency: Ministry of Health

Project Number: NL 6091-3

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 2002 results

Title of the presentation: Antiacetylcholinesterase activity of cyclosporine A in selected parts of the rat brain - a comparison of single and repeated administration and effect of 7-methoxytacrine

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

Faculty of Medicine, Charles University and University Hospital, Hradec Králové: Inst. Clin Biochem. and Diagnostics (1), Purkyně Medical Academy Hradec Králové: Dept. Toxicol. (2), Academy of Science, Inst. Exp. Biopharm. and PRO. MED. CS., Hradec Králové (3)

The aim of this study was to compare single and repeated per os administration of cyclosporine A (CSA) and the interaction of repeated administration of CSA and 7-methoxytacrine (MEOTA) on the activity of acetylcholinesterase (ACHE) in frontal cortex, hippocampus, septum and basal ganglia in rats. CsA is a cyclic monopolar polypeptide consisting of 11 amino acids. A membrane fluidizing effect of CsA possibly increase penetration of some compounds through cell membranes and organ barriers. MEOTA is a relatively moderate inhibitor of cholinesterases in vitro as well as in vivo conditions. MEOTA has in comparison with its parent drug tacrine a lower degree of undesirable effects, especially of hepatotoxicity. Both single and repeated administration of CSA diminished the activity of ACHE in the frontal cortex, septum and basal ganglia, while the enzyme activity in the hippocampus was diminished in the case of repeated CSA, as well as repeated CSA + MEOTA administration. Repeated administration of CSA led to a further augmentation of anticholinesterase activity only in frontal cortex and - in a lesser extent - in the basal ganglia. No augmentation of ACHE activity was observed in the hippocampus and septum

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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, Miroslav Pecka, Luděk Haman

Starting date: 17.7.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1710000

Summary of 2002 results

Title of the presentation: Activation of hemostasis during radiofrequency catheter ablation

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

Fac.Med., Charles Univ., Hradec Králové: 1st Dept. of Medicine (1), 2nd 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 have been reported after RFA but the low incidence of overt clinical events has been a limitation to the study of factors affecting thrombogenic risk. Therefore 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 studied activation of coagulation, fibrinolysis and platelets in group of 45 patients (27 female, 18 male, mean age 47 +- 14 years) after RFA till this time. Most of the ablation procedures were performed for the following indications: atrioventricular node reentry tachycardia (n=29) and accessory pathway mediated tachycardia (n=13). Serial blood samples were drawn at three time points: 1/ pre-procedure, 2/ upon completion of the diagnostic electrophysiology study, but before radiofrequency energy application, 3/ at the conclusion of the procedure (approximately 30 min after the last radiofrequency application).

Statistical analysis of levels of prothrombotic markers before and after RFA showed significant changes of fibrinolysis and fibrinogenesis activation parameters (plasminogen activator inhibitor, D dimer and thrombin-antithrombin complex). Analysis of platelets activation parameters showed non-significant changes.

Longitudinal results confirmed activation of hemostasis during radiofrequency ablation procedures, especially on level of fibrinogenesis and fibrinolysis.

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

Address for correspondence: P. Pařízek, 1st Dept. of Medicine, Charles University, Faculty Hospital, Hradec Králové, Sokolska str., 500 36, 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 2002 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.ofRadiodiagnostic(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 sex 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 seventeen patients. After healing, we did a control arthroscopic examination in eight patients. The defect was healed by a compact cartilaginous tissue. Bioptic samples were taken from the transplantate in seven patients. The microscopic finding consisted of hyaline cartilage and fibrocartilage. Twenty 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: A survey of patient care in out-of-hospital cardiac arrests in the East Bohemian region.

Grant Agency: Ministry of Health

Project Number: NO/7254-3

Principal Researcher: Miloslav Pleskot

Joint Researchers: Jaroslav Kajzr, Zdeněk Tušl, Miroslav Měšťan, Miloslav Tauchman, J. Střítecký, J. Kvasnička, V. Černý

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 9308

Summary of 2002 results

Title of the presentation: A survey of patient care in out-of-hospital cardiac arrests in the East Bohemian region.

Authors: Miloslav Pleskot (1), Jaroslav Kajzr (1), Zdeněk Tušl (1), Miroslav Měšťan (1), Miloslav Tauchman (1), J. Střítecký (1), J. Kvasnička (1), V. Černý (2)
Charles Univ. Prague, Fac. Med. Hr.Králové: Ist Dept. Med. (1), A&E clinic (2)

Introduction: Out-of-hospital cardiac arrest (CA) is a serious medical, social, economic and organisational problem. Long-term results in these patients depend on the quality and organisation of mainly out-of-hospital care.

AIM: Analysis of clinical data and, diagnostic and therapeutic approaches in individual stages of care in patients with out-of-hospital CA in the East Bohemian region. Authors surveyed the number of cases that were hospitalised and the number discharged.

Method: From 1.1.2002 to 31.12. 2002 authors collected data, with the aid of questionnaires, from 26 rescue centres in the East Bohemian region in a group of 175 patients (124 men, 51 women) with an age range of 16 to 97 years (arithmetic mean 66 ± 13 years) with out-of-hospital CA. CA was defined as sudden unexpected non-traumatic loss of consciousness as a consequence of circulatory arrest.

Results: From the total 175 patients, 121 (69,1%) died "on-the-spot" and 19 (10,9%) during transportation to hospital. Layman resuscitation was provided in 53 cases (30,3%). ECG findings of ventricular fibrillation was seen in 50 cases (28,6%), polymorphic ventricular tachycardia in 6 (3,4%), monomorphic ventricular tachycardia in 3 (1,7%) and asystole in 101 (57,7%). 35 patients (20%) were admitted to the intensive care unit. Acute myocardial infarction was diagnosed in 10 cases (28,6% of the total hospitalised patients). 7 patients (4%) were discharged home.

Conclusions: Results of this project show a high lethality in patients with out-of-hospital CA (only 4% were discharged home). The patients who survived, had immediate layman CPR, short arrival times of ambulance and prompt invasive procedures at the cardiac centre for acute myocardial infarction. This study questions the effectiveness of this costly care.

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Title of the research project: Multimedial educational atlas of applied osteology on www

Grant Agency: FR VŠ

Project Number: 2532/F3/02

Principal Researcher: Blanka Pospíšilová

Joint Researchers: Olga Procházková

Starting date: 1. 1. 2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 120000

Summary of 2002 results

Title of the presentation: Multimedial educational atlas of applied osteology on www

Authors: Blanka Pospíšilová, Olga Procházková

Fac. Med. Charles Univ., Hr. Králové: Dept of Anatomy

Our Anatomy department disposes with an extensive human dry skeletal material which essentially originated from the Broumov Ossuary (13th-18th century). The Broumov bone collection contains number of unique cases of variations, anomalies, and pathologies of bones. Numerous of remarkable showpieces are displayed in the Anatomical museum which serves for teaching of medical students as well the students from further schools. However, the utilization of the museum for teaching purposes is somewhat limited due to the space constraints, time, and personnel shortages. That is why we considered desirable making this extraordinary museum collection accessible via computer. We have arrayed the interesting cases of variations, anomalies, and pathologies of human dry bones didactically, documented photographically and arranged in the Power Point presentations as the photographic ATLAS OF APPLIED OSTEOLOGY. The photographic atlas of variations, anomalies, and pathologies of human bones is concurrently installed on the www.lfhk.cuni.cz/anatomie and also available on CD-ROM and as a printed MANUAL in Anatomy department teaching facilities.

Literature: Aufderheide, AC, Rodríguez-Martín C. The Cambridge encyclopedia of human paleopathology. 1st ed. Cambridge:Cambridge University Press, 1998:478.

Project was supported by the Ministry of Education Grant Agency, No2532/F3/02

Address for correspondence:

MUDr. Blanka Pospíšilová, Dept. of Anat., Fac. Med., Charles Univ., Šimkova 870, 500 01 Hradec Králové 1, (Czech Republic), e-mail: pospisl@lfhk.cuni.cz

Title of the research project: The application of ¹³C-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: 1.1.1999

Duration (years): 3

Funds allocated for project - total in Czech crowns: 362

Summary of 2002 results

Title of the presentation: I. Detection of Helicobacter pylori infection in children with ¹³C-urea breath test. II. C-mixed triglyceride test in patients with cystic fibrosis.

Authors: Oldřich Pozler (1), David Neumann (1), Viktor Voříšek (2), Jan Bureš (3), Hubert Vaníček (1). 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).

I. ¹³C-urea breath test (¹³C-UBT). 285 of ¹³C-UBT were performed in 245 children, in 55 of them (37 female, 18 male; median of age 13,8yrs) contemporaneously with upper gastrointestinal endoscopy and assessment of Helicobacter pylori (Hp) with histologic study of antral gastric mucosa and rapid urease test (RUT). The median of the D-over baseline (DOB) value in 34 children classified as negative by histology and RUT (control group) was 1,45 at 30minutes (mean 2,04 +- 2,08). The statistically calculated optimal cutoff value was 6,2 for the whole control group. The influence of age on DOB was demonstrated when we divided control group into two age groups. The DOB values median was 8,2 for children 10yrs old and less and 4,0 for children older than 10yrs. The median of DOB values in 21 Hp positive children (Hp group) was 22,74 (mean 31,261+-19,30). The mean DOB value of Hp group was significantly different than the mean DOB value of control group (p<0.001). The sensitivity and specificity of ¹³C-UBT was 90,5% and 94,1% for the whole group, 93,3% and 92% in older patients (>10yrs) The sensitivity and specificity were significantly lower in children below 10yrs of age. II. ¹³C-mixed triglyceride (¹³C-MTG) breath test. 13 of ¹³C-MTG tests were performed in 13 cystic fibrosis (CF) patients (age 9,9-25,5 yrs, median 20,3). ¹³C-MTG were administrated as a single oral dose 250mg with test meal Nutridrink. 10 pancreatic insuf-ficient patients were treated with Kreon or Panzytrate during of test. Breath samples were taken in 30 minutes intervals over 15 hours (30 samples from each patients were analysed). The percentage of the ¹³C dose recovered (PRD) was calculated. The median of PRD was 14,82% in all CF patients. The PRD median in pancreatic insufficient patients was signifi-cantly different than in pancreatic sufficient (13,5% and 22,3%, p=0,016).

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Title of the research project: A randomized, double-blind comparative study of parenteral nutritional support with or without glutamine in autologous stem cells transplantation for hematologic malignancies

Grant Agency: Ministry of Health

Project Number: NB/7000-3

Principal Researcher: Alice Poznarova

Joint Researchers: Jiri Horacek, Pavel Zak, Miloslav Kmonicek, Jaroslav Maly

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 360000

Summary of 2002 results

Title of the presentation: A randomized, double-blind comparative study of parenteral nutritional support with or without glutamine in autologous stem cells transplantation for hematologic malignancies

Authors: Alice Poznarova, Jiri Horacek, Pavel Zak, Miloslav Kmonicek, Jaroslav Maly
Faculty Hospital, Department of Hematology, Hradec Kralove

Standards of nutritional support in bone marrow transplantation have recently been questioned due to advent of newer techniques of supportive care that shorten the critical post-transplant period. Our aim was to evaluate the possible significance of prophylactic parenteral nutrition (PN) in stem cells transplantation and the suggested advantage of glutamine (Gln) supplementation. 41 adult patients were randomized to receive either prophylactic PN starting with the cytoreductive regimen (P group, n=19), or PN given if oral intake became inadequate (control C group, n=22). In each group they were further randomized to receive standard PN with L-Ala-L-Gln (0,5 g Gln/kg). The groups were compared in the hospitalization period and during follow-up (median 20 months). The results are expressed as medians, significance was tested using Mann-Whitney and Wilcoxon tests, as appropriate. For survival analysis, Kaplan-Mayer method was used. The higher cost in the P group was not compensated for by better outcome. There was no significant difference in the length of hospital stay, time to engraftment, G-CSF consumption, or in the nutritional markers (prealbumin, transferrin, cholinesterase). On the contrary, in the P group there were significantly ($p < 0,05$) more days with fever $> 38^{\circ}\text{C}$ (1.5 vs. 0 in group C), higher antibiotics (atb) consumption (16 vs. 8 atb.days) and more blood transfusion units (2 vs. 0) were needed. Gln-supplemented patients did not do better in any of the parameters tested. In the follow-up, 6 other patients died and 7 relapses were seen. There was no overall difference in survival or relapse rate between C and P groups. Surprisingly, more relapses were found in Gln-supplemented patients and these also had worse overall survival (73% vs. 95%).

Project was supported by the Ministry of Health Grant Agency, No NB/7000-3

Address for correspondence: A.Poznarova, Dept. of Hematology, Faculty Hospital, Hradec Kralove, Sokolska 483, 500 00 Hradec Kralove, Czech Republic

Title of the research project: Telepathology and its use in surgical pathology

Grant Agency: Ministry of Education

Project Number: 2520/02-F3

Principal Researcher: Ales Ryska

Joint Researchers: Marie Ludvikova, Ivo Steiner

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 233

Summary of 2002 results

Title of the presentation: Telepathology - its present state and future prospects

Authors: Ales Ryska (1), Marie Ludvikova (2), Ivo Steiner (1)

(1) Fac. Med., Charles Univ., Hr. Kralove: Dept. of Pathology, (2) Fac. Med., Charles Univ., Plzen: Dept. of Pathology

The aim of the project was to introduce modern methods of telemedicine diagnostics in surgical pathology into undergraduate study program.

Telepathology belongs to a group of modern tools within telemedicine. It can be used in diagnostics of various lesions, for consultations of problematic surgical pathologic cases, for educational purposes (demonstration of rare lesions) and for second opinion in case of diagnostic doubt.

For the undergraduate students of pathology we have developed an interactive www interface. At the address www.telepatologie.cz the students have a possibility to encounter interesting cases and discuss on-line their differential diagnosis.

During the practical workshop, students actively participated in telepathology practice capturing digital microscopic images and, together with clinical data, uploading them on the web.

During the seminar, state of the art and future prospects, possibilities and limits, as well as pitfalls of telepathology are demonstrated.

The project was supported by the Ministry of Education Grant Agency, No 2520/02-F3.

Address for correspondence: Ales Ryska, MD; Department of Pathology; Charles University Medical Faculty Hospital; CZ-500 05 Hradec Kralove; CZECH REPUBLIC;
ryskaale@fnhk.cz

Title of the research project: Invasive measurement of cardiovascular functions in rabbit.

Grant Agency: Ministry of Education

Project Number: 2521/F3/02

Principal Researcher: MUDr. Václav Šafka, Ph.D.

Joint Researchers: Doc. MUDr. Zuzana Červinková, CSc., MUDr. Michaela Adamcová, CSc.

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: -296000

Summary of 2002 results

Title of the presentation: Invasive measurement of cardiovascular functions in rabbit in medical physiology classes.

Authors: Václav Šafka, Zuzana Červinková, Michaela Adamcová

Aim: Fundamental innovation of practical classes in medical physiology, in which we demonstrate measurement and monitoring of cardiovascular parameters and their modulation by physiological regulatory mechanisms in an animal model in rabbit.

Methods: From the grant resources we achieved ADInstruments appliance PowerLab/4ST with appropriate software and peripheral sensors and interfaces. This allows us to continuously and simultaneously record, process and display several parameters as blood-pressure pulsations, systolic and diastolic pressure, ECG, cardiac frequency and central venous pressure during the educational experiment. We also can discontinuously and repeatedly measure the cardiac output by bolus thermodilution method and then calculate the changes of stroke volume and peripheral venous resistance. Connected stimulation electrode allows us to stimulate directly the vagal nerve.

Results: This system enables exact measurement, calculation and display of all the physiologically and clinically relevant cardiovascular parameters in a small animal, together with influence of physiological regulatory mechanisms via neural and humoral pathways. We find it very instructive in the classes of cardiovascular physiology. It brings not only practical application of memorised information, but also real experience with care for vital functions of a living subject.

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Title of the research project: Use of Reflotron analyser for modernizing the preventive medicine education.

Grant Agency: Ministry of Education

Project Number: 2522/F3/02

Principal Researcher: Jindra Šmejkalová

Joint Researchers: Zdeněk Fiala, Jaroslav Tejral

Starting date: 1.1.2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 168000

Summary of 2002 results

Title of the presentation: Use of Reflotron analyser for modernizing the preventive medicine education.

Authors: Jindra Šmejkalová, Zdeněk Fiala, Jaroslav Tejral

Charles Univ. Prague, Fac. Med. Hr. Králové: Dept. Hyg. Prev. Med.

Hygiene and preventive medicine belongs to the preventive disciplines taught at the Faculty of Medicine. Among others we try to teach our students the basic methods of primary and early secondary prevention of cardiovascular diseases (CVD), as used by general practitioners. We try to demonstrate a simple screening program of the CVD risk factors assessment. That is why we perform in our students: 1) nutritional state assessment (BMI, WHR, % of body fat), 2) biochemical analysis of total cholesterol, HDL-cholesterol, triacylglycerols and glucemia, 3) measuring the blood pressure and vital capacity, 4) assessment of A/B type of behaviour, 5) questionnaire inquiry of the nutritional habits, smoking, level of physical activity and neuropsychical load. After this checking up we discuss the individual and collective results and recommend the possible intervention. Up to now the biochemical analysis has been done by LACHEMA tests of blood samples taken from cubital vein. Such an investigation was cheap, but due to the short expiration time of used laboratory chemicals, was performed only after sampling all the students. The time interval between investigation and results being thus as long as two months. An advantage of Reflotron analyser and its test strips, bought from the funds of this grant, is represented by the possibility of obtaining immediate results. The practical training is thus more comprehensive, up to date and positively evaluated by students, which is factual output of our project. Now we try to compare the results of both methods as we have simultaneously performed both blood tests in our students. Our preliminary results showed some differences, some of them even statistically significant, when comparing with previously used laboratory method (eg. mean values of refl. chol: 4,03 vs. set chol: 4,65mmol/l). Supported by Grant: FRVŠ 2522/F3/02.

Address for correspondence: Jindra Šmejkalová, Dept.of Hygiene and Prev. Med., Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500038 Hradec Králové, Czech Republic

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: Zdeněk Fiala, Lenka Borská, Dana Fialová

Starting date: 1.1.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 234000

Summary of 2002 results

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

Authors: Jindra Šmejkalová (1), Lenka Borská (2), Hana Skalská (3), Zdeněk Fiala (1), Dana Fialová (4).

Fac. Med., Charles Univ., Hr. Králové: Dept. of Hygiene and Preventive Medicine (1), Dept. of Pathological Physiology (2), University Hr. Králové: Dept. of Informatics and Quantitative Methods (3), Dept. of Physical Education and Sports (4).

The aim of our study is to administer an anonymous questionnaire concerning the self-perception of health risk of workers in various professions. Their knowledge, attitudes and behaviour in essential health questions were also assessed. In the year 2002 we went on collecting data and their statistical analysis. Till now we have analysed 574 questionnaires from 242 teachers of all school levels, 170 factory workers of mostly risk professions a 160 health professionals (doctors and nurses). Our results obtained until now show, that our respondents are exposed to a number of risk factors resulting from their professions, but above all from their way of life. Nevertheless, marked differences can be found among individual professional groups. The worst situation was found in the group of factory workers. They are most exposed to negative life style factors (59% of those smoke, 42% suffer from overweight and 18% from obesity, they have bad nutrition habits and low physical activity). In this group we also see the biggest risks cumulation, though being largely underestimated. Factory workers are not aware of these risks (47%), and if they are, they do not want to solve the situation (29%). The same goes for appreciating the health prevention - 34% of workers don't participate in preventive check-ups by general practitioners and 32% in stomatological prevention. 72% of workers don't know their blood pressure level and 94% of them the level of cholesterol. We also confirmed significant risk underestimation of teachers and medical workers in spite of high level of education. Supported by Grant: GA UK No. 90/2001.

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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. 2000

Duration (years): 2

Funds allocated for project - total in Czech crowns: 809367

Summary of 2002 results

Title of the presentation: The influence of total parenteral nutrition enriched with glutamate or glutamin on plasma amino acid levels and amino acid clearance

Authors: L. Sobotka (1), E. Havel (2), J. Maňák (1), L. Šprongl (3), Z. Zadák (1)
Fac. Med., Charles Univ., Hr. Králové: Dept. of Metabolic Care nad Gerontology (1), Dept. of Surgery (2), Faculty Hospital Motol, Charles University Prague, Dept. of Biochemistry (3)

Introduction:

A positive effect of glutamin (GLN) was described in various studies. However effect of glutamic acid (GLU), which can be precursor of GLU, is not known. The aim of present study was to compare the effect of a parenteral nutrition enriched with GLU or GLN on plasma concentrations and clearance of both amino acids.

Methods:

Twelve patients requiring total parenteral nutrition were studied in prospective, randomized, crossover design. They received parenteral nutrition enriched with GLU (18g per day) or GLN (14g of GLN and 4 g of GLU per day) for one week followed by second system. Plasma aminogram was analyzed 2 hours and 7 days after the onset of respective regimen. Metabolic clearance of amino acids was expressed as rate of amino acids infusion divided by plasma level.

Results:

Plasma concentration of GLU acid rose both after GLU (151.6 ± 50.3 vs 93.5 ± 60.1 $\mu\text{mol/l}$) and GLN (160.7 ± 77.7 vs 40.5 ± 13.6 $\mu\text{mol/l}$) administration. The increase of GLU administration from 4 g per day to 14 g per day led to the significant rise in GLU clearance (219.2 ± 93.8 and 1101.0 ± 437.1 ml/min, respectively). No signs of toxicity were apparent during GLU administration.

Conclusions:

GLN or GLU administration did not changed respective amino acid level. GLU was effectively metabolized when its dosage was increased from 4g to 18 g per day.

Address for correspondence: L. Sobotka, Department of Metabolic Care and Gerontology - Medical Faculty, Charles University, Teaching Hospital, Sokolská 581, 500 05 Hradec Králové

Title of the research project: Magnetic resonance versus Thallium scintigraphy in the detection of viable myocardium. Propective comparative study

Grant Agency: GA ČR

Project Number: NA/7248

Principal Researcher: MUDr. Miroslav Solař

Joint Researchers: Miroslav Solař, Jan Žižka, Jiří Doležal, Ludovít Klzo, Jaroslav Vižda, Jaroslav Āintěra, Jiří Ceral Jiří Kvasnička, Vladimír Lonský, Pavel Źáček

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1506000

Summary of 2002 results

Title of the presentation: Contrast enhanced magnetic resonance imaging and thallium scintigraphy in the detection of viable myocardium

Authors:

Miroslav Solař, Jan Źiřka, Jiří Doleřal, Ludovít Klzo, Jaroslav Viřda, Jaroslav Āintěra, Jiří Ceral Jiří Kvasnička, Vladimír Lonský, Pavel Źáček

Introduction

New method in the detection of viable myocardium is contrast enhanced magnetic resonance imaging. This method is based upon accumulation of paramagnetic contrast agen in the irreversibly damaged myocardium. The aim of our study was to compare this method to thallium scintigraphy that belongs to the current standard techniques in this indication.

Study cohort

There were 24 patients enrolled in the study. All of them had coronary artery disease and impaired systolic function of the left ventricle. The mean ejection fraction was 35 %.

Methods

In every patient enrolled the viability study was performed both by thallium scintigraphy and magnetic resonance imaging using corresponding short axis views. Viability assessment was determined according to thallium activity and the amount of contrast enhanced tissue.

Results

Myocardial viability was determined in 879 segments. Using both methods corresponding results were observed in 53.7 % segments. In 20.7 % segments that were considered as nonviable by thallium scintigraphy there were signs of viability according to magnetic resonance study. In 32.3% of those segments there were no sings of irreversible myocardial injury on magnetic resonance study.

Conclusion

According to the results of our study it seems possible that thallium scintigraphy can better identify patient with coronary artery disease and systolic dysfunction of the left ventricle who are candidates for myocardial revascularisation.

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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 2002 results

Title of the presentation: Determination of urinary neopterin and serum thiobarbituric acid reactive substances in the nonagenarians

Authors: D. Solichová (1), B. Melichar (2), M. Klejna (3), L. Korecká (4), V. Bláha (1), P. Žďánský (1), Z. Zadák (1)

(1) Departments of Metabolic Care and Gerontology, (2) Oncology and Radiotherapy, Charles University Medical School, Teaching Hospital, Hradec Králové, (3) Hospital for Chronically Ill, Hradec Králové, (4) Faculty of Chemical Technology, University of Pardubice, Czech Republic

Twelve self-sustaining nonagenarians, 10 women and 2 men, aged 94 ± 3 years, and eight institutionalised nonagenarians, 8 women, aged 91 ± 1 year as well as eleven control subjects, 7 women and 4 men, aged 84 ± 5 years entered the study. Urinary neopterin, an indicator of systemic immune activation, and serum thiobarbituric acid reactive substances (TBARS), a marker of lipoperoxidation, were determined initially, and collection of the blood and urine samples was repeated at 3 months interval.

Neopterin was measured in the urine specimens by reversed-phase high performance liquid chromatography. Thiobarbituric acid reactive substances (TBARS) were determined spectrofluorometrically.

The significance of differences between nonagenarians and control group was examined by ANOVA - Kruskal-Wallis tests, using statistical software NCSS 6.0.21 (Kaysville, UT, 1996). The decision on significance was based on $P = 0,05$.

Urinary neopterin was significantly higher in institutionalised compared to self-sustaining subjects and controls (625 ± 565 mmol/mol creatinine vs. 203 ± 63 mmol/mol creatinine, and 198 ± 128 mmol/mol creatinine, respectively, $P = 0,006$). The serum TBARS were higher in both groups of nonagenarians ($3,23 \pm 1,16 \mu\text{mol/l}$ and $2,69 \pm 0,39 \mu\text{mol/l}$ vs. $2,12 \pm 0,83 \mu\text{mol/l}$ for the self-sustaining, institutionalized and controls, respectively, $P = 0,023$).

Supported by grant of 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. Špaček, 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: 180000

Summary of 2002 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 project is joined by many US 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 data (numbers, types, sizes, areas, volumes and 3D reconstructions of synapses, dendritic spines, organelles, etc, in the cerebral cortex) available to other brain research centers via the Internet website. Series of ultrathin sections on which the studies were made perhaps became the most in detail analyzed volumes of the cerebral cortex in the world.

The author supplied the website with The Atlas of Ultrastructural Neurocytology containing more than 450 electron micrographs and 3D reconstructions. The Atlas and other components of the website are widely used as an up-to-date educational resources for students of neurobiology (e.g., in Boston, New York, Liverpool, Basel).

The total number of logged accesses (website hits) as revealed by Microsoft site server statistics reached more than 3 millions during the last 2 years. The "Synapse Website" was positively reviewed by Science and Nature journals, named "Page of the Month" and awarded for an outstanding contribution by Society for Psychology, USA.

References:

<http://synapses.bu.edu/> J. Comp. Neurol. 393:58-68, 1998 Brain Res. Rev. 39:29-54, 2002

Address for correspondence: Josef Špaček, The Fingerland Dept. of Pathology, Charles University Hospital, 500 05 Hradec Králové, 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 2002 results

Title of the presentation: OUR EXPERIENCE WITH THE BONE GRAFTS IN THE TREATMENT OF THE BONE DEFECTS.

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 purpose of this study is to assess the long-term results of the bone grafts used in the filling of the bone defects.

Materials and methods: Between January 1990 and December 2000 119 patients were treated by curettage of the bone lesion and filling of the defect with bone grafts at our institution. In 2002 20 patients showed up for the follow-up. There were 12 male and 8 female and their average age was 18 years (range 5 to 60 years), alogenous bone grafts were used in 13 cases and autogenous bone grafts in 7 cases. The primary diagnoses were unicameral bone cyst in 10 cases, fibrous metaphyseal defect in 5 cases, enchondroma in 2 cases and others in 3 cases. Clinical examination, plain X-rays and three-phase bone scintigraphy were performed at the follow-up with range 2 to 8 years and average 5 years.

Results: Normal carrying capacity of the extremity without inflammatory changes of soft tissues were found in all cases. No structural changes were observed on plain X-rays in 13 cases, irregular or higher bone density were found in 7 cases. The monitored level of osteoblastic activity of bone tissue in the area of implanted bone grafts was normal in 13 cases and increased in 7 cases (irregular or higher bone density was observed in this group in 5 patients).

Conclusions: We observed the correlation between irregular or higher bone density on plain X-rays and increased level of osteoblastic activity of bone tissue in the area of implanted grafts in our group of patients after filling of the bone defect with the bone grafts. These results will be compared to a group of patients after filling of the bone defects with BAS-0 bioactive material. 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: 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, Jan Kremláček, Iva Krulichová, Vladimír Mašín, Emil Rudolf, Zdeněk Fiala, Vlasta Tošnerová

Starting date: 1.1.1999

Duration (years): 5

Funds allocated for project - total in Czech crowns: 1943000

Summary of 2002 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 Fac. Med., Charles Univ., Hr. Králové: Dept. of Medical Biophysics

In correspondence with the proposal (see <http://camelot.lfhk.cuni.cz/fyzika/> reference Granty) the fourth year activity was concentrated on 1) the development of the applications of programs for analysis of mechanical properties of tissues and materials for bioimplants, the construction of teaching phantom for ultrasound imaging and the development of multithermocouple sensors for invasive measurement of temperature profile, 2) the analysis of cataract surgery with capsular tension ring and traumatic cataracts in children, the prevention of post-traumatic endophthalmitis, the differential diagnosis of organic and functional disorders of the eye and the decompression surgery in the region of the optical nerve, 3) the development of the hypertext program for undergraduate students in fields of biostatistics, pharmacotherapy training, 4) the time-lapse microscopy of living cells (see <http://www.formatex.org/micro2002/content.htm>) and its use in programmed cell death, the developing of digitized video streams and their use in animal-free teaching in medical education, 5) testing the software for transfer and storing of data from stabilographic plane and statokinesiometric examinations written in the past year. New instruments purchased for the solution of this grant included MIC-D digital Microscope Olympus and computer controlled thermostat. For backup and support of the above-mentioned goals new hardware was purchased: 4 notebooks, image processing hardware and CRDW and DVDRW mechanics. Software paid from the allocated funds included renewal of STATISTICA v.6, MATHLAB licenses, new LabView program, IMAQ, Quickphoto for PC control, Adobe Acrobat and Photoshop.

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: Interactive atlas of human embryology

Grant Agency: Ministry of Education

Project Number: 2529/G3/02

Principal Researcher: Danuše Šubrtová

Joint Researchers: Tomáš Soukup, Tomáš Matějek

Starting date: 1. 1. 2002

Duration (years): 1

Funds allocated for project - total in Czech crowns: 120000

Summary of 2002 results

Title of the presentation: Interactive atlas of human embryology

Authors: Tomáš Soukup, Tomáš Matějek, Lucie Uhrová, Danuše Šubrtová

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

Embryology has never been such an important part of the medical curriculum as it is today. It encompasses many aspects of cellular and molecular biology as well as the traditional descriptive developmental anatomy. Because of its dynamic aspect, embryology can be found a discipline that is extraordinarily demanding as to three-dimensional imagination. The purpose of the presented student project is to create the interactive pictorial teaching tool (in the form of computer file) which will make learning of human embryology easier. The collection of drawings, diagrams, animations, and microphotographs, accompanied by a concise text, covers some topics of early development and development of the body systems (gastrulation, neurulation, development of the cardiovascular system, etc.). Using this tool, the student can test his knowledge by self-examination, too.

Project was supported by the Ministry of Education Grant Agency, No 2529/G3/02.

Address for correspondence: D. Šubrtová, Dept. of Histology and Embryology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Republic

Title of the research project: Photopic electroretinography in diabetics

Grant Agency: Ministry of Health

Project Number: NK/6835/-3

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 2002 results

Title of the presentation: Photopic electroretinography in diabetics

Authors: Jaromír Svěrák, Jaroslav Peregrin, Eva Rencová, Josef Kvasnička

The ERG examination of three groups of diabetic patients in photopic conditions continued: 1. diabetic patients without any diabetic changes (n 37) 2. patients with simple diabetic retinopathy (n 22) 3. persons with proliferative and preproliferative retinopathy after the photocoagulation (21) Significant reduction of the b-wave potentials just in the first group has been observed. Further reduction of the amplitudes appeared in patients with diabetic retinal changes. Therefore not only the scotopic b-wave and oscillatory potentials in diabetics are altered. ERG examination provides valuable information for the decision to the photocoagulation therapy. The results have been just published.

Further in 50 healthy persons the methodical aspects of the 15 Hz ERG flicker have been studied and normal values have been obtained.

Svěrák, J., Peregrin, J., Rencová, E., Kvasnička, J.: Photopic ERG in diabetics. Čs. oftal., 58, 2002, p.71-74 (in czech)

Address for correspondence: Prof. MUDr. Jaromír Svěrák, DrSc., Oční klinika FN Hradec Králové

Title of the research project: Effectivity of the biventricular stimulation assessed by changes induced pulse amplitude

Grant Agency: Ministry of Health

Project Number: NA 7261-3

Principal Researcher: Miloslav Tauchman

Joint Researchers: Jiří Kvasnička, Anush Babu, Miloslav Měšťan, Zdeněk Tušl, Miloslav Pleskot, Petr Pařízek, Pavel Rejchrt, Martin Sivák

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 405.000

Summary of 2002 results

Title of the presentation: Effects of different stimulation sites on hemodynamic performance estimated by changes in pulse amplitude

Authors: Tauchman M, Měšťan M, Tušl Z, Kvasnička J, Pleskot M, Pařízek P, Babu A, Rejchrt P, Sivák M

In 2002 there were 8 patients included in the study. The patients were implanted with pacemakers with biventricular modality of pacing because of treatment of heart failure. Three of them with malignant ventricular tachyarrhythmias and heart failure were implanted with implantable cardioverter-defibrillators with modality of biventricular pacing.

Basic examinations were performed in all patients and initial follow-ups were done.

MUDr. Měšťan created a special software for the quantification of atrial contribution and for estimation of hemodynamic effect of pacing modes.

Address for correspondence: Dr. Miloslav Tauchman, 1st Department of Internal Medicine, Faculty Hospital, 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 Tošnerová

Joint Researchers: Libor Straka, Eva vaňásková, Zdeněk Miláček, Karel Martinik

Starting date: 1.1.2000

Duration (years): 3

Funds allocated for project - total in Czech crowns:

Summary of 2001 results

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

Authors: Vlasta Tosnerova (1), Libor straka (2) Eva Vanaskova (3)

Charles University. Prague, Fac. Med., Hradec Kralove (1,3,4), external worker (2)

Upright posture in human represents maintaining equilibrium between various disturbances and contractions of muscles 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 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 healthy persons (20 males, 30 females), aged 18-24 years, all students were examined. Their overall body status (fitness) was evaluated before FP investigation. We extenden examination about evaluation of aging people. There were evaluated 3 groups of people in age 25-34, 35-44, 45-54. Evry aging group had 20 probands. We compared statstically these groups with young group (18-24). Results has shown larger everage of CP then in young group. We can conclude that older groups is posible to use as standards for agin people.

Literature: Steffen, T.M.: Age- and gender related tests performance in community, Physical Therapy, 2002, 82,2,128-138

Address for correspondence: V. Tosnerova, Dept. of rehabilitation, Carles Univessity, in Prague, Fac. of Medicine, Hradec kralove, Nezvalova 956, Czech Republic.

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

Grant Agency: Ministry of Health

Project Number: NF67533/2001

Principal Researcher: Ivan Tůma

Joint Researchers: Marek Pérez, Zuzana Lenderová

Starting date: 17.7.2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1951000

Summary of 2002 results

Title of the presentation: Donepezil as an adjunctive treatment to risperidone for cognitive dysfunction in schizophrenia

Authors: Ivan Tůma (1), Zuzana Lenderová (1), Marek Pérez (2)

Charles University in Prague, School of Medicine and Teaching Hospital in Hradec Králové, Dept of Psychiatry (1) Psychiatric Hospital Opava (2)

The key domains of cognitive dysfunction in schizophrenia are memory, attention and executive functions impairments. Despite the partial effect of novel antipsychotics on cognition other treatment of cognitive dysfunction need to be considered. 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 augmentation of risperidone treatment by cholinergic drug donepezil. The study is designed as a double blind placebo controlled study. Fourteen schizophrenic outpatients stabilized on risperidone have completed the entire protocol. Eight of them were randomized to receive donepezil (5 mg p.d. the first 30 days and 10 mg for next 82 days). Six subjects received placebo. Donepezil did not produce significant improvements in any cognitive parameter (memory functions, attention, learning, executive functions) compared with placebo. The same negative results were reported by Friedman et al. (2002). This is an preliminary report limited by small group of subjects who have entered the study so far. The study will continue in 2003 year.

Literature: Friedman JI, Adler DN, Howanitz E, Harvey PD, Brenner G, Temporini H, White L, Parrella M, Davis KL. A double blind placebo controlled trial of donepezil adjunctive treatment to risperidone for cognitive impairment of schizophrenia. Biol. Psychiatry 2002;51:349-357.

Project was supported by Grant Agency of Ministry of Health, No NF67533/2001

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:

The Amaranth Fractionation and Application of actively cultivated components to the improvement of nutrition and health of population

Grant Agency: Ministry of Industry and Trade ***Project Number:*** FB-C3/10/00

Principal Researcher: Miloš Jelínek

Joint Researchers: Zdenek Zadák, Radomír Hyšpler, Petr Žďánský

Starting date: 1.1.2000

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1502000

Summary of 2002 results

Title of the presentation: Amaranth Products in Human Nutrition

Authors: Miloš Jelínek (1), Zdeněk Zadák (2), Petr Žďánský (3)

Fac. Med. Charles Univ., Hr. Králové: Dept. of Gerontology and metabolic care (2,3)

AMR AMARANT a.s. (1)

Project abstract

The aim of the project proposal is a development and realization of the technology for fractionation of amaranths flour to gain nutritionally important components, i.e. protein, fat, starch and dietary fibre. The project is distinguished for some basic aspects:

High-technology

Special fractionation technology combined with supercritical extraction

Nutritionally extraordinary products Oil, protein, starch and dietary fibre

Dietetic products (oil, fibre, extracts), developed in a very short time forms yet integrated rows and together with increasing rows of food products with amaranth starting give this crops to the consumer sub consciousness AMARANTH FIBRE

Amaranth seeds are richer in fibre content (3,2 to 5,8%) than cereals (wheat, barley, rye, rice, maize 0,9 to 2,1%).

The fibre content is different in the light and dark sorts of amaranth seeds. The dark seeds contain more fibre than the light ones, but they have a lower portion of soft fibre. The light seeds (grains) contain about 8% of dietary fibre and the soluble fibre therefrom represents 33 to 44%.

Export activities and import substitution Interest and demand for application the products in: pharmaceutical industry, food industry, health service, cosmetics

Project was supported by the Ministry of Industry and Trade No.: FB-C3/10/00

Address for correspondence: Z. Zadák, Dept. of Metabolic Care and Gerontology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 Hradec Králové

Title of the research project: Development of fat emulsion for parenteral nutrition and technical realization of its application.

Grant Agency: Ministry of Industry and Trade **Project Number:** FD - K/033

Principal Researcher: Jan Mikeska

Joint Researchers: Ladislav ČERVINKA, Tadeáš GRAICHMAN, Alois KOZUBÍK, Jiřina HOFMANOVÁ, Zdeněk ZADÁK, Radomír HYŠPLER, Luboš SOBOTKA, Iva MACKOVÁ, Irena FRANCOVA, Kateřina STANKEOVÁ, Zdeněk KOBLIC, Marie MŇUKOVÁ

Starting date: 19. 7. 2001

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1450000

Summary of 2002 results

Title of the presentation: Report of solution project in programme KONSORCIA for Ministry of industry and trade of the Czech Republic. (2002)

Authors:

Jan MIKESKA (1), Tadeáš GRAICHMAN (1), Alois KOZUBÍK (2), Jiřina HOFMANOVÁ (2), Zdeněk ZADÁK (3), Luboš SOBOTKA (3), Radomír HYŠPLER (3), Kateřina STANKEOVÁ (1)

INFUSIA, a.s., Hořátev (1), Institute of Biophysics, Academy of Sciences of the Czech Republic (2), Fac. Med., Charles. Univ., Hradec Králové (3)

In the Report are described all steps and practical results of team work in development of new fat emulsion for parenteral nutrition. The project is based on a wide co-operation of laboratory of cytokinetics, clinical centre and manufacturer. Thus, basic research, development and application is connected.

Address for correspondence: J. Mikeska, INFUSIA, a.s., Hořátev, ul. Pekařská 8, 155 00 Praha 5 - Nové Butovice, Czech Republic

Title of the research project: Complex utilization of Amaranth biomass

Grant Agency: Ministry of Industry and Trade **Project Number:** FD - K2/73

Principal Researcher: Miloš Jelínek

Joint Researchers: Zdenek Zadák, Radomír Hyšpler, Petr Žďánský

Starting date: 1.1.2002

Duration (years): 3

Funds allocated for project - total in Czech crowns: 230000

Summary of 2002 results

Title of the presentation: Complex utilization of Amaranth biomass

Authors: Miloš Jelínek (1), Zdeněk Zadák (2), Radomír Hyšpler (3), Alena Tichá(4), Petr Žďánský (5)

Fac. Med. Charles Univ., Hr. Králové: Dept. of Gerontology and metabolic care (2,3,4,5)
AMR AMARANT a.s. (1)

Project abstract

Monitoring nutritive changes biomass amarantu in particular phase growth with aim look for possibilities utilization for foodstuff or their fortification.

The aim of the project proposal is a development and realization of the technology for fractionation of amaranths biomass, nutritionally important components, i.e. flavonoids, fibre, protein, natural vitamins. The project is distinguished for some basic aspects:

High-technology

Dietetic products -fibre, extracts ant supplements for food fortification.

Amaranth biomass are richer in fibre and the fibre ate rich for calcium. .

Fresh leaves of amaranth contain in average 1,3% fibre, in dried leaves its content is high (7 to 14,3%). Raw spinach contains 0.6% fibre, dried spinach 6%. Amaranth bionad are rich in protein (dry about 20%) - high quality - rich to lzyine.

Project was supported by the Ministry of Industry and Trade No.: FD - K2/73

Address for correspondence: Z. Zadák, Dept. of Metabolic Care and Gerontology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Republic

Title of the research project: Changes 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, Darmar Solichová, Vladimír Bláha

Starting date: 1.1.2000

Duration (years): 3

Funds allocated for project - total in Czech crowns: 1125000

Summary of 2002 results

Title of the presentation: Changes of lipid metabolism and its mediator-related effects in patients with colorectal carcinoma - prospective impact in nutritional support.

Authors: see above

The research project has been solved in cooperation of the Department of Metabolism and Gerontology, Charles University Prague, Faculty of Medicine Hradec Kralove and Biophysical Laboratory, Czech Academy of Science, Brno.

The results are composed from several parts :

1. Experimental part focused on the problems of regulative role of Sodium butyrate and polyunsaturated fatty acids in the grow and differentiation of colon cancer cells. Results of this part made possible to construct new recommendation in nutrition support in cancer patients.
2. Analysis of the metabolic parameters in colon cancer patients and their reaction to the surgical intervention. Results were statistically analyzed and compared with control groups (nonmalignant surgical patients and healthy subjects). This study revealed suppression in the cholesterol biosynthesis and depletion of cholesterol precursors, phenomenon which could change contemporary nutritional recommendations.
3. Role of fermentable and non-fermentable dietary fibre in the colon cancer development is still puzzle. The main problem is quantitative measurement of dietary fibre fermentation and production of short chain fatty acids (SCFA). For this purpose the original method of dietary fibre fermentation measurement based on the methane determination in breath has been developed and introduced in the practical use. The method is recently submitted to the patentation.
4. New information obtained as a result of research project permits construction of enteral formulas suitable for nutritional support of cancer patients above all suffering from colon cancer. The enteral formulas have been recently submitted to patentation.
5. Results were published as 25 journal articles, including 7 in the international journals with impact factor.

Address for correspondence: Z. Zadák, Dept. of Metabolic Care and Gerontology, Charles University in Prague, Faculty of Medicine in Hradec Králové, Šimkova 870, 500 38 Hradec Králové, Czech Republic

