FEPS

Federation of European Physiological Societies

FEPS NEWSLETTER

January 2006, #5

Deadline abstract submission of the Joint German Physiological Society and FEPS in Munich, 26-29 March, 2006

January 10, 2006

Deadline Symposia Proposals of the Joint Slovak Physiological society, the Physiological Society and FEPS in Bratislava, September 11-14, 2007

February 15, 2006

http://www.feps.org

Secretariat
FEPS Newsletter:
Sonia Froidmont
Dept. of Physiology
University Maastricht
P.O. Box 616
6200 MD Maastricht
The Netherlands

Phone: +31-43-3881200
Fax: +31-43-3884166

s.froidmont@fys.unimaas.nl

Letter of the President of the FEPS

Dear Colleagues,

The size of this Newsletter is larger than it has been seen before. For good reasons! We are now starting to publish reports and summaries of some of the activities from the preceding joint meeting in Bristol: the accounts from the Physiology Teaching Workshop. We publish here reports from United Kingdom, Germany, Finland, Italy, Hungary and the Netherlands. They will later be uploaded on the "Physiology Teaching" section on the FEPS Homepage. It is my hope that FEPS will be contribute to put teaching on the agenda by arranging the annual Teaching Symposium during the joint meetings with national Societies, and by bringing written accounts from all the European nations. The topic of this year's Symposium is Problem Based Learning in physiology in the medical curriculum – read the details below in this Newsletter. We also plan for a more exhaustive data-base on the status of Physiology teaching across Europe.

The European Young Physiologist Symposium (EYPS) at the upcoming Munich meeting is a continuation of a tradition in the British and Irish Physiological Society. The arrangement was a success at the joint meeting in Bristol – and there are all the reasons to believe that this success will continue – just look at the program below. The topic of this year is: "Molecular Biology as a tool in Physiological Research" – with keynote lectures and more specialized workshops.

The Lectures and Symposia for the Munich meeting are all settled, and a detailed schedule for this part is presented in this Newsletter. The core of the program is realized by the input of ***all*** participants – and as announced on the top of this Newsletter the deadline for abstract submission is extended to January 10 – so submit your abstract and join a meeting filled with interesting Lectures and Symposia – on the top of the free communications.

It is important that the members of the national Societies are actively participating in shaping these joint meetings. Do that by proposing Symposia for the 2007 joint meeting in Bratislava – the deadline for those proposals is set to February 15, 2006 – decisions will be made at the Munich meeting this year.

It is with great pleasure that we can notice that the FEPS Newsletter is now reaching most of the national Society members – the goal is that every member shall receive it on her/his e-mail address – distributed by the national Society. If you do not receive it that way, please notify your national Society – and FEPS Secretary General Ger van der Vusse (mail to: s.froidmont@fys.unimaas.nl).

Finally, I join in wishing all of you – and the European Physiology - a Happy New Year

Hans Hultborn
President of the Federation of European Physiological Societies

---

Joint Meeting
of
The German Physiological Society
and
The Federation of European Physiological Societies (FEPS)

Munich, Germany

March 26-29, 2006

See for registration and abstract submission :

http://physinst.web.med.uni-muenchen.de/dpg06/

Deadline for submision of abstracts :
January 10, 2006

Featuring:
The European Young Physiologists Symposium (EYPS)
and
The FEPS-supported Symposium on Innovative Methods in Teaching Physiology, Experiences with Problem Based Learning
on Sunday March 26, 2006

Joint Meeting of
The German Physiological Society and
The Federation of European Physiological Societies (FEPS)

Munich, March 26 - 29, 2006

Program

Program Committee

Prof. Dr. Busse, Frankfurt
Prof. Dr. Deußen, Dresden
Prof. Dr. Jelkmann, Lübeck
Prof. Dr. Jonas, Freiburg
Prof. Dr. Pfitzer, Köln
Prof. Dr. Pott, Bochum
Prof. Dr. Richter, Göttingen
Prof. Dr. Misgeld, Heidelberg

Prof. H. Hultborn, Copenhagen, Denmark
Prof. G. van der Vusse, Maastricht, Netherlands
Prof. B. Lumb, Bristol, United Kingdom
Prof. E. Sykova, Prag, Czech Republic
Prof. H. Murer, Zürich, Zwitzerland

Program Scheme

Time	Saturday, March 25th	Sunday, March 26th	Monday, March 27th	Tuesday, March 28th	Wednesday, March 29th
8:15-10:30	10:00 Satellite Symposium New and Emerging Techniques in Electrophysiologa	Young FEPS	Symposia (6x)	Symposia (6x)	Symposia (6x)
Pause					
10:45-11:45		Young FEPS	Main Lecture	Main Lecture	Main Lecture
11:45-12:30			Poster	Poster	Poster
Pause					
13:30-15:00	Satellite Symposium	Workshops (2x), Symposia (4x)	Orals (7x)	Orals (7x)	Orals (7x)
15:00-15:45			Poster	Poster	Poster
Pause					
16:00-17:30		Young investigators	Orals (7x)	Orals (7x)	Orals (7x)
Pause					
17:45-18:45		Young investigators	Main Lecture	Main Lecture	Main Lecture
18:45		Opening/Welcome	Member's Assemblies	Congress Dinner	

List of Symposia and Symposia speakers Munich 26-29, 2006

Sunday, March 26, 2006

	Symposia Titles	*Chairmen/ Poposers*	*Speakers*	*Title Topic*
SS1	Innovative methods in Teaching Physiology - Experiences with Problem Based Learing	Snoeckx/ Di Benedetta	Luc Snoeckx	Teaching Physiology via Problem Based Learning. An introduction
			Carlo di Benedetta	The pros and contras in our experience for implementing the PBL and COE methodology in traditional Medical Schools
			Gillian Maudsley	Tutoring medical students in a problem-based curriculum : roles and realities
			Anne Custers	How do students experience PBL as a vehicle for learning Physiology
			To be announced	The relation between computer technology and PBL
			Mascha Verheggen	How can we reliably evaluate knowledge acquired via PBL
SS2	Purinergic mechanisms in muscle nociception	Ellrich	Alan North	Purinergics and peripheral pain mechanisms
			Ulrich Hoheisel	Excitatory effects of ATP on muscle afferents
			Eike D. Schomburg	Spinal sensorimotor control and purinergics
			Jens Ellrich	P2X receptors and neck muscle pain
SS3	New insights in cerebellar physiology	Kolb	Christopher H. Yeo	Cerebellar function in motor memory formation
			Steve A. Edgley	Information processing in cerebellar cortex
			Dagmar Timmann	Cerebellum and Cognition
			Matthias Maschke	Influence of cerebellar dysfunction on motor learning.
			Hans-Peter Thier	The cerebellar basis of motor learning
SS4	Gas channels in membranes	Gros	H Ehmke	Evidence for transport of molecular CO2 across the red cell membrane by aquaporin 1 and AE1
			R Kaldenhoff	The tobacco aquaporin NtAQP1 is a membrane CO2 pore with physiological functions
			WF Boron	Role of aquaporin 1 for CO2 permeation across the luminal membrane of the rat kidney proximal tubule
			AE Hill	What are aquaporins for?
			G Gros	Contribution of aquaporin 1 and Rh proteins to the CO2 permeability of the human red cell membrane
			JP Cartron	Rhesus proteins constitute a pathway for gaseous NH3
			TP Jahn	Aquaporin homologues in plants and mammals transport ammonia
SS5	Cardiovascular Genomics	Raizada	Andrew Baker	Viral vectors for cardiovascular gene therapy
			Robin Davisson	Physiological genomics of the cardiovascular system
			Julian Paton	Central cardiovascular control and neural gene transfer
			David Paterson	NO and cardiac functions
			Mohan Raizada	Gene therapy for hypertension

Monday, March 27, 2006

	Symposia Titles	*Chairmen/ Poposers*	*Speakers*	*Title Topic*
SM1	Purinergic transmission in the nervous system	Verkhratsky	A. North, A. Verkhratsky H. Zimmermann Peter Illes O. Krishtal A. Nistri	Unitary purinergic EPSCs in cortical neurones Nucleotide signalling in adult neurogenesis Purinoreceptors in neuropathology P2X receptors as targets for opiates and cannabinoids Molecular physiology of P2X receptors
SM2	The mouse model for investigation of motor control in health and disease	Schomburg	Jens Ellrich Bror Alstermark Ole Kiehn Eike D. Schomburg	Long term depression of nociceptive reflexes in mice In vivo recordings of bulbospinal excitation in adult mouse forelimb motoneurones Physiological, anatomical, and genetic identification of CPG neurones in the developing spinal cord of the mouse Fatigability of spinal motor reflexes in the SOD1-G93A mouse – a model for ALS
SM3	The hypoxia response : from mussel to man	Gassmann	Doris Abele Thomas A. Gorr Roland Wenger Max Gassmann Joachim Fandrey Patrick Maxwell	The hypoxia response in mud clam and fish Drosophila and Daphnia in hypoxia The molecular response to hypoxia in mammals Hypoxia, HIF, Epo and excessive erythrocytosis Imaging hypoxia in mammalian cells The impact of HIF and CAIX in tumorigenesis
SM4	Cardio-mechano electric feedback: from pipette to patient	Kohl	Gerrit Isenberg Jean-Luc Balligand André Klebér Uli Schotten Peter Kohl	Effects of different modalities of mechanical stimulation (stretch, compression) on ion handling in cardiac myocytes and non-myocytes Endogenous Nitric Oxide mediates regulation of cardiac contractilityand Ca2+ responses to stretch Mechanical effects on cardiac action potential propagation Role of mechanical factors in initiation and sustenance of atrial fibrillation Mechanical interventions for initiation and termination of ventricular tachyarhythmia
SM5	Alveolar fluid transport: new insights into lung edema and injury	Kübler	Sadis Matalon Stuart Wilson Christine Clerici Thomas Jonassen Ardeschir Ghofrani	Function and regulation of alveolar fluid transport Ion channels regulating alveolar fluid transport Alveolar fluid transport and the resolution of pulmonary edema Adaptation of alveolar fluid transport in congestive heart failure Impaired alveolar fluid clearance in acute lung injury
SM6	Development of the cardiovasc. system: plasticity through genetic and environmental factors	Dragon	Prof. Dr. Rob Poelmann Prof. Dr. A.F Moorman Prof. Carlos E. Blanco Prof. Dr. Bernd Pelster Prof. Dr. Bernd Fleischmann Prof. Dr. Peter Carmeliet	Development-related changes in the expression of shear stress responsive genes in the developing cardiovascular system of chicken embryos. Architectural plan for the heart: early patterning and delineation of the chambers and the nodes. Effect of prenatal hypoxia on cardiovascular function of the adult Developmental plasticity of the cardiovascular system; blood distribution of the zebrafish incubated under hypoxic conditions in vivo. Embryonic stem cell-derived pacemaker and cardiomyocytes. Role of VEGF during cardiovascular development

Tuesday, March 28, 2006

	Symposia Titles	*Chairmen/ Poposers*	*Speakers*	*Title Topic*
ST1	Blood vessels and nerves: common signals and pathways in development	NN	DG. Wilkinson HG. Augustin NN EB Pasquale	Diverse roles of eph receptors and ephrins in the regulation of cell migration and tissue assembly EphB receptors and ephrinB ligands: regulators of vascular assembly and homeostasis to be announced Eph receptors in the adult brain
ST2	Calcium handling in normal and diseased heart	Sipido	Andrew Trafford Peter Vangheluwe Natal van Riel Andras Varro Laszlo Ligeti	Adapting the systolic calcium transient to the influences of age and day length. The critical role of SERCA2 affinity in the regulation of calcium handling and cardiac function Computational analysis of disturbed calcium handling in the intact heart To be announced Calcium handling in the diabetic heart
ST3	GABA and epilepsy	Köhling	Kai Kaila Matthew Walker George Kostopoulos Marco de Curtis	KCC2 and CA7 and their role in epilepsy Tonic activation of GABA receptors and epilepsy Functional differentiation along the axis of the hippocampus and its relevance for epileptogenesis Parahippocampal circuits and epileptogenesis
ST4	Mechanisms of glia axon communication and nervous system repair	Hülsmann	Arthur Butt Michael Sereda Eva Sykova Jacqueline Trotter Norbert Weidner	Calcium signalling in NG2-expressing glia Genetic defects of myelination: molecular pathogenesis of hereditary neuropathies (CMT1A) Glia, stem cells and biomaterials - working together to repair spinal cord injury NG2-expressing cells in glial-axonrecognition and myelination. Cell-contact mediated axonal regeneration in the injured spinal cord.
ST5	Molecular mechanisms operating in the normal and diseased proximal tubule: new insights and perspectives	Devuyst	Heini Murer / Carsten Wagner Olivier Devuyst / Pierre Courtoy Erik I. Christensen Thomas Willnow / Anders Nykjaer	Transport of amino acids, phosphate, and organic cations/anions in the proximal tubule Endocytosis in the proximal tubule: Insights from mouse models of renal Fanconi syndrome Lysosomal storage and Fabry disease Multiligand receptors-derived strategies to prevent aminoglycoside-induced nephrotoxicity
ST6	Physiology and biophysics of KCNQ potassium channels	Friedrich	Holger Lerche Guiscard Seebohm Thomas Jentsch Jacques Barhanin Álvaro Villarreal Michael Schwake	The retigabine interaction site of KCNQ channels KCNQ1 kinetics and influence of the beta subunit KCNE1 Insights into systems biology of KCNQ channels Gain-of-Function Mutations of KCNQ1 and KCNE2 in familial atrial fibrillation ? Mechanisms underlying KCNQ2/3 heteromeric potassium M-channel potentiation? Interaction of antiepileptic drugs with KCNQ channels?

Wednesday, March 29, 2006

	Symposia Titles	*Chairmen/ Poposers*	*Speakers*	*Title Topic*
SW1	Versatility of intracellular signalling pathways: From receptor to network plasticity	Ponimaskin	Stefan Offermanns	Mouse models for study G-protein-mediated signalling
			Nevin Lambert	GABAB-receptor and IRK interactions
			Guillermina Lopez-Bendito	GRCRs in developing brain
			Evgeni Ponimaskin	New signaling pathways mediated by 5-HT receptors
			Weiqi Zhang	GABAB-receptor signalling in postnatal development
			Maria Waldhoer	GPCR heterodimer-selective agonists
SW2	Cardiac physiology and pathophysiology in transgenic mice	Suleiman	K. Zacharowski	Knock-out mice and the role of cardiac Toll-like receptors
			D. Escande	Mouse models of cardiac arrhythmias and conduction defects
			K. Willecke	Expression and function of connexins in mouse heart
			Chris Jackson	Cardiac characteristics of ischaemically diseased mouse heart
			Costanza Emanueli	Cardiovascular pathology of kallikrein-kinin system in mouse
SW3	Aldosterone and vascular function	Skott	Martin Wehling	Rapid effects of aldosterone on vascular function
			Michael Gekle	Aldosterone signaling mechanisms: the role of EGFR.
			Hans Oberleithner	Aldosterone and endothelial cell function; lessons from the atomic force microscope.
			Ole Skøtt	Rapid effects of aldosterone on renal afferent arterioles.
			Allan D. Struthers	Effects of aldosterone blockade on endothelial function in patients; type 2 diabetes and heart failure
SW4	Chloride channels: structure function disease	Schwarz	Thomas Jentsch	Introduction and overview about ClC channels
			Michael Pusch	Biophysics and molecular pharmacology of Cl--transporting ClC proteins.
			Anselm A. Zdebik	Chloride-Proton exchangemediated by ClC Proteins
			Alessandro Sardini	Cell volume–regulated chloride channels
			Sheppard David N.Sheppard	CFTR: from physiology to clinic
SW5	Amino acid transporters: expression regulation and physiological role	King	Matthias Bransch	Transporters for proline and proline-containing peptides
			Hannelore Daniel	Biology of proton-driven amino acid (and peptide) transporters
			Hari Hundall	Sensing and signalling mechanisms underlying the regulation of the System A amino acid transporter in response to changes in amino acid availability
			David Thwaites	The SLC36 family of amino acid transporters
SW6	Calcium Signalling	Garaschuk/ Parekh	Arthur Konnerth	Synapses/ Calcium and Neurotransmitter release
			Ole Petersen	Calcium Oscillations, Calcium Waves and the Pancreas
			Jose Lopez-Barneo	Calcium Signalling and Hypoxia
			Anant Parekh	Store-operated Channels and Cell Signalling
			Franz Hoffmann	Calcium Channels

European Young Physiologist Symposium (EYPS)

Munich, March 26, 2006

Special platform for all European Young Physiologists up to the age of 35

Preceding the joint meeting of The German Society of Physiology and the Federation of European Physiological Societies

Theme:
"Molecular Biology as a tool in Physiological Research"

No extra fee for EYPS & Several awards to win!

Registration and abstract submission at:
http://physinst.web.med.uni-muenchen.de/dpg06/

Abstract deadline January 10, 2006!!!!

EYPS Program

8:30-8:35	Opening EYPS	
8:35-9:15	Keynote Lecture: Atherosclerotic Plaque Rupture, Esther Lutgens	
9:15-9:35	Oral	
9:35-9:55	Oral	
9:55-10:15	Oral	
Pause	Poster set up	
10:45-11:25	Keynote Lecture: VEGF in Neurological Disease, Diether Lambrechts	
11:25-11:45	Oral	
11:45-12:05	Oral	
Pause	Lunch Moderated Poster Session	
13:30-14:30	Workshop I Quantitative PCR	Workshop II Stem Cells
Pause		
14:45-15:45	Workshop III RNA interference (Invitrogen)	Workshop IV Career Planning
Pause		
16:00-17:30	Young Investigator Award	
Pause		
17:45-18:45	Young Investigator Award	
18:45-….	General Welcome Reception	
20:30-…	EYPS Party	

European Young Physiologist Symposium (EYPS)

We hope you will take the chance to come to the beautiful city of Munich to enjoy a whole day of outstanding science together with other young physiologists!

The organizing committee,

Heike Beck
(Institute of Physiology, Ludwig Maximilians University, Munich, Germany)

Katarina Likavcanova
(Institute of Experimental Medicine ASCR, Prague, Czech Republic)

Jörg Niehüser-Saran
(Cardiovascular Division, King's College London, United Kingdom)

Adam Steensberg
(Copenhagen Muscle Research Centre, Copenhagen, Denmark)

Birgit Teunissen
(Department of Physiology, University of Maastricht, The Netherlands)

Joint Meeting of
The German Physiological Society and
The Federation of European Physiological Societies (FEPS)

FEPS-supported Symposium on Innovative methods in Teaching Physiology Experiences with Problem Based Learning

Munich, March 26, 2006
13:00 - 16:15

The main topic of this symposium is the implementation of Physiology Teaching in a Medical Curriculum making use of Problem Based Learning.

PROGRAM

Luc Snoeckx *Dept. Physiology, Maastricht University, Maastricht, The Netherlands*	Teaching Physiology via Problem Based Learning. An introduction
Carlo di Benedetta *Dipartimento di Farmacologia e Fisiologia Umana, Medical School Bari University, Bari, Italy*	The pros and contras in our experience for implementing the PBL and COE methodology in traditional Medical Schools
Gillian Maudsley *Division of Public Health, University of Liverpool, Liverpool, United Kingdom*	Tutoring medical students in a problem-based curriculum: roles and realities
Anne Custers *Student Medicine, Maastricht University, Maastricht, The Netherlands*	How do students experience PBL as a vehicle for learning Physiology
Martin Fischer *Munich University, Germany*	The relation between computer technology and PBL
Mascha Verheggen *Department of Educational Development & Research, Maastricht University, Maastricht, The Netherlands*	How can we reliably evaluate knowledge acquired via PBL
David CM Taylor *Faculty of Medicine, The School of Medical Education, University of Liverpool, UK*	Using PBL with final year physiology students

Join the Annual FEPS Lecture in Munich 2006!

François Verrey
Institute of Physiology,
University of Zurich.

The Annual FEPS Lecture 2006 is given by

Professor François Verrey

"New Epithelial Amino Acid Transporters"

Professor Verrey has made seminal contributions to our present understanding of amino acid transporters. In his lecture he will cover this topic broadly – as seen from just the most recent publications his works does not only cover the kidney, but also as diverse organs and cells as the gastric mucosa; muscles and neurons in *C. Elegans* - and bacterial membrane transporters!

Recent publications:

Kirchhoff P, Dave MH, Remy C, Kosiek O, Busque SM, Dufner M, Geibel JP, Verrey F, Wagner CA. An amino acid transporter involved in gastric acid secretion. Pflugers Arch. 2005 Nov 25

Lourdel S, Loffing J, Favre G, Paulais M, Nissant A, Fakitsas P, Creminon C, Feraille E, Verrey F, Teulon J, Doucet A, Deschenes G. Hyperaldosteronemia and Activation of the Epithelial Sodium Channel Are Not Required for Sodium Retention in Puromycin-Induced Nephrosis. J Am Soc Nephrol. 2005;16:3642-3650.

Ramadan T, Camargo SM, Summa V, Hunziker P, Chesnov S, Pos KM, Verrey F. Basolateral aromatic amino acid transporter TAT1 (Slc16a10) functions as an efflux pathway. J Cell Physiol. 2005 Oct 21

Ristic Z, Camargo SM, Romeo E, Bodoy S, Bertran J, Palacin M, Makrides V, Furrer EM, Verrey F. Neutral amino acid transport mediated by ortholog of imino acid transporter SIT1/SLC6A20 in opossum kidney cells. Am J Physiol Renal Physiol. 2005 Oct 18

Staub O, Verrey F. Impact of Nedd4 Proteins and Serum and Glucocorticoid-Induced Kinases on Epithelial Na+ Transport in the Distal Nephron. J Am Soc Nephrol. 2005; 16:3167-3174.

Romeo E, Dave MH, Bacic D, Ristic Z, Camargo SM, Loffing J, Wagner CA, Verrey F. Luminal kidney and intestine SLC6 amino acid transporters of B0AT-cluster and their tissue distribution in Mus musculus. Am J Physiol Renal Physiol. 2005 Sep 20;

Camargo SM, Makrides V, Virkki LV, Forster IC, Verrey F. Steady-state kinetic characterization of the mouse B(0)AT1 sodium-dependent neutral amino acid transporter. Pflugers Arch. 2005 ;451:338-48

Verrey F, Ristic Z, Romeo E, Ramadan T, Makrides V, Dave MH, Wagner CA, Camargo SM. Novel renal amino acid transporters. Annu Rev Physiol. 2005;67:557-72. Review.

Veljkovic E, Bacconi A, Stetak A, Hajnal A, Stasiuk S, Skelly PJ, Forster I, Shoemaker CB, Verrey F. Aromatic amino acid transporter AAT-9 of Caenorhabditis elegans localizes to neurons and muscle cells.
J Biol Chem. 2004;279:49268-73.

Lahoutte T, Caveliers V, Camargo SM, Franca R, Ramadan T, Veljkovic E, Mertens J, Bossuyt A, Verrey F. SPECT and PET amino acid tracer influx via system L (h4F2hc-hLAT1) and its transstimulation. J Nucl Med. 2004;45:1591-6.

Joint Meeting
of
The Slovak Physiological Society
and
The Physiological Society
and
The Federation of European Physiological Societies

BRATISLAVA, September 11-14, 2007

Call for Symposia Proposals

The Bratislava meeting will be the third annual meeting that FEPS has held jointly with one or more of its constituent societies. The meeting will consist of:

- Symposia
- Oral and Poster Communications
- State of the art Lectures
- Young FEPS Symposium
- Trade Exhibition

Format of the main scientific programme
Parallel symposia will be held in the mornings and afternoons are reserved for free oral communications and poster sessions.

Symposia may be arranged under the following broad themes:

- Cardiovascular Physiology
- Muscle: Muscle Contraction, Heart & Cardiac Muscle, Smooth Muscle
- Cellular and Molecular Physiology: Cellular Signalling and Ion Channels
- Renal and Gastrointestinal Physiology, Transport Physiology
- Respiratory Physiology
- Endocrinology, Neuroendocrinology, Metabolism
- Gravitational Physiology
- Neurophysiology – Cellular and Integrative
- Teaching Physiology

Some of the themes listed above will certainly attract many proposals, and thus may generate more than one symposium. The intention is to cover as many physiological fields as possible in the listed themes. It is, however, not the intention to restrict any field from which proposals can be made.

How are the Symposia chosen, selected and organized?
The Scientific Programme Committee is now inviting members of all FEPS constituent Societies for proposals. It is most likely that the number of proposals will far exceed the framework of the meeting. Therefore a selection has to be made, and each symposium has to be tailored to be of scientific excellence, and at the same time represent the FEPS member Societies.

Call for Proposals:
In order to start the process of organizing the symposia, the Scientific Programme Committee is therefore now inviting all member Societies to forward suggestions for Symposia and speakers (maximum of 5 speakers for a 2 and a half hour's symposium). **Proponents should check whether the suggested speakers are available at the time of the meeting.** In order to achieve the time plan given below the proposals should reach the Scientific Programme Committee **before February 15, 2006**.

Proposals should be forwarded on copies of the attached form to Daniela Jezova (daniela.jezova@savba.sk).

General timetable:
February 2006 – deadline for submission of proposed symposia
March 2006 – selection of symposia and formation of provisional programme by Scientific Programme Committee at the Munich meeting

With best wishes from the organizers
The Scientific Programme Committee

(David Eisner, Hans Hultborn, Daniela Jezova, Bridget Lumb, Tana Ravingerova, Eva Sykova)

Proposal of a Symposium for the

Joint Meeting of the Slovak Physiological Society

and the Physiological Society

and the Federation of European Physiological Societies

Completed application forms should be returned the latest by February 15th, 2006 via e-mail to Daniela Jezova (**daniela.jezova@savba.sk**)

1. Name, address, phone and email of person(s) organising the Symposium:

2. Details of proposed Symposium:

a) Title of symposium:

b) Brief statement on symposium topic and justification for its timeliness:

3. Provisional Scientific Programme:

The symposium should comprise of 4-5 speakers, talking for 20 minutes each (+ time for discussion), drawn from FEPS constituent societies and other international societies. Once finalised, each symposium will be funded to a limited extent.

Speaker	**Affiliation**	**Topic/Title**

Reports

of the Physiological Teaching Symposium at the Joint Physiological Society and FEPS meeting in Bristol, 2005

- **E. Lloyd**, Department of Physiology, University of Bristol, UK
  "Physiology Teaching in the Medical Curriculum in the UK."

- **S. Silbernagl & M. Gekle**, Department of Physiology, University of Wuerzburg, Germany
  "Physiology Teaching in Germany."

- **L. M. Peltonen**, Department of Biomedicine/Physiology, 00014 University of Helsinki and The Finnish Physiological Society, Helsinki, Finland
  "Teaching Medical Physiology in Finnish Universities."

- **F. Vitiello & C. Di Benedetta**, Dipartimento di i Farmacologia e Fisiologia Umana, Medical School of the Bari University, Italy
  "Medical Physiology Teaching in Italy and New Experiences in the Bari Medical School."

- **G. Benedek**, Department of Physiology, Faculty of Medicine, University of Szeged, Hungary
  "Teaching of Physiology in Hungary. Are the problems local or general?"

- **L.H.E.H. Snoeckx & G.J. van der Vusse**, Department of Physiology, Faculty of Medicine, Maastricht University, the Netherlands
  "New experiences in teaching Physiology through a PBL approach."

- **A.R. Gardner-Medwin**, Department of Physiology, University College London, UK
  "Confidence-Based Marking: encouraging rigour through assessment."

Physiology Teaching in the Medical Curriculum in the UK

E. Lloyd
Department of Physiology, University of Bristol, UK

The standard programme in the United Kingdom (UK) leading to the award of a medical degree (MB ChB) lasts for five years whilst graduate entry students may undertake a four-year "fast track" programme. Students may also elect to pursue a further year of study to read an Intercalated Bachelor of Science (B.Sc) degree in Physiology or a related subject. Two medical schools provide the opportunity for a small number of exceptional students to combine their medical studies with research training leading to the award of a MB PhD degree.

In 1993 the General Medical Council (GMC) published *Tomorrow's doctors: Recommendations on Undergraduate Medical Education.* The document suggested that the traditional divide between pre-clinical and clinical components was a significant factor in perpetuating factual overload within the curriculum. The document did not define a core curriculum but encouraged each medical school to develop its own syllabus and lead to the introduction of special study modules (SSMs) that allowed students to explore their academic interests in greater depth. The majority of medical schools developed a systems-based approach with teaching delivered by both biomedical scientists and clinicians throughout the programme whilst a smaller number of schools have adopted problem-based learning.

Since 1997 there has been a 60% increase in the number of students entering UK medical schools, this has been accommodated by expansion of the existing schools and inauguration of four new schools. A questionnaire was sent to all the UK medical schools to examine the current state of Physiology teaching. The new medical schools tend to have fewer dedicated physiology teachers (mean = 2) than the established schools (mean = 15) and rely upon General Practitioners and National Health Service (NHS) doctors to contribute to the teaching of Physiological principles.

The survey revealed that there is a large variation between medical schools in the amount of Physiology teaching in the undergraduate curriculum. Some respondents pointed out that it was often difficult to identify Physiology sessions within an integrated curriculum. A typical course consists of 54 lectures, 21 tutorials and 21 hours of practical teaching, predominantly delivered in the first two years of the programme. 89% of practical sessions involve the use of human subjects such as the recording of electrocardiograms whilst the remaining sessions utilise demonstrations and/or computer simulations.

Each medical school uses at least three assessment techniques. Over 33% use the blueprinting technique to construct their examination papers in order to test that the students have achieved the expected learning outcomes. The use of essays and oral examinations appears to be decreasing due to problems with inter-rater reliability and the increasing numbers of students. Over 65% of medical schools use Multiple Choice Questions (MCQs) that can be marked using computer software. The use of short notes, extended matching questions and clinical case studies is also widespread across the UK.

The areas of innovative practice highlighted by the respondents were

- The use of virtual learning environments
- Increased use of computer aided learning
- Earlier exposure to patients
- Integrated of teaching and assessments
- Physiological concepts emphasised in weekly clinical meetings

The results of the survey suggest that there is significant difficulty in recruiting staff with the experience to teach systems Physiology in the post genomic era and that recruitment is biased towards the research priorities of the institution. This has major implications for the new medical schools that do not have a department of Physiology. The increase in medical students without a corresponding increase in academic staff has caused problems for the established medical schools. There is also a perception that the basic medical sciences have been undervalued in the curriculum reforms driven by the General Medical Council. There is emerging evidence, from post-graduate examinations, of a decrease in junior doctors' knowledge and understanding of anatomy and the same may be true for Physiology.

There appears to be and urgent need for further examination of the breadth and depth Physiological concepts and principles that are taught in UK medical schools in order to define a core curriculum. There is also a need to evaluate the effects of the curriculum reforms of the last decade upon postgraduate training.

Physiology Teaching in Germany

Teaching physiology in context with clinical medicine became obligatory in the new German medical curriculum (effective from 2003).

S. Silbernagl & M. Gekle
Dept. Of Physiology, University of Wuerzburg, Germany

The first independent departments (Institutes) of Physiology were founded in the middle of the 19th century. The Departments of Physiology became usually part of the Medical Faculties of Universities. The Departments of Physiology are responsible for the education of medical and dental students usually in the 2nd year of their curriculum. To a smaller extent, these departments also teach udents of psychology, pharmacy, sports, informatics, biomedicine, ology and others.
stbi

The 35 Medical Faculties/Schools of Germany (2004)

Graphics by MFT

How many students, how many physiologists?
In Germany, there are about 34,000 applicants/year who compete for about 8,400 places/year at the Medical Schools (Numerus clausus).
In Wuerzburg, 280 Medical students/year plus 90 Dental students/year are taught by 12 physiologists (6 professors and 6 academic assistants). Thus, the student/teacher ratio amounts to 370/12 = 31 students/physiologist

Who teaches physiology to medical and dental students?
The close ties of Physiology to Medicine in Germany are also reflected in the fact that virtually all German textbooks of Physiology of the last 150 years were written by MDs and concentrate on human physiology.
There is no Master or PhD in Physiology in Germany. Thus, until the 1970ies, nearly all physiologists teaching physiology to medical and dental students had been educated in Medicine themselves (Dr. med.). Within the last thirty years, however, more and more biologists (Dr. rer. nat.) entered the Departments of Physiology. Today, MDs became an "endangered species" in most Departments of Physiology.

The medical curriculum in Germany
When the Medical student has passed the Numerus clauses, she or he has to serve for 3 months ("Krankenpflegedienst", prior to the first part of the medical examination) plus 4 month ("Famulatur", prior to the final examination) in a hospital between the terms.

Subjects during 1st and 2nd year
Biology, Physics, Chemistry, Anatomy, Physiology, Biochemistry, Medical Psychology and Sociology, Introduction into clinical medicine, Medical terminology, and one optional subject (obligatory)

First part of medical examination (written part: nationwide; oral/practical part: locally)

Subjects during 3rd to 5th year
Pathology, Microbiology/Virology, Pharmacology, Human Genetics, Forensic Medicine, Family Medicine and 15 further "classic" clinical disciplines. New subjects are Epidemiology/Medical Informatics, Ethics, Public Health, Geriatric Medicine, Emergency Medicine, Economics of Health Care, Rehabilitation, and one optional subject (obligatory).

The *6th year* is the „Practical year" (clerkship; bedside teaching exclusively)

2nd part of medical examination (written part: nationwide; oral/practical part: locally)

Physiology: The curriculum
Nationwide rules by law ("Ärztliche Approbationsordnung") are effective since 2003. As some details are not identical in the German Medical Schools, the ***Wuerzburg curriculum*** is given here as a representative example:

2nd year
Obligatory (Academic hrs [= 45 min]/student)**:**
86 hrs Laboratory course (groups of 5 to 10): Experiments (2 examinations)
32 hrs Seminars (groups of 20): Case-oriented (Physiology & Pathophysiology)
28 hrs „Integrated" Seminars (groups of 20): Case-oriented (joined by clinical teachers)

28 hrs Pathophysiology lecture (if taken as an optional subject: max. 50 participants): Case-oriented (1 examination if taken as optional subject)

Not obligatory (Academic hrs/student)**:**

84 hrs Physiology lecture: Systemic physiology, partly cases and pathophysiological aspects

Dept. of Physiology, Univ. of Wuerzburg, designed by Adolf Fick in the 1870ies

End of 2nd year: First part of medical examination (written part: nationwide; oral part: locally)

Physiology: The topics (Wuerzburg curriculum)

84 hrs Physiology lecture: Respiration & Acid-Base; Blood & Immunology (basics); Heart & Circulation; Kidney, Salt & Water; Nutrition, GI tract & Liver; Electrophysiology; Neurons & Synapses; Muscle & Motor system; Senses & Sensory system; Hormones; Higher functions of the CNS

86 hrs Laboratory course: Blood, Heart & ECG; Circulation; Respiration; Kidney, Salt & Water; Acid-base; Exercise; Energy turnover; Thermoregulation; Carbohydrate digestion;
Nerve; Acoustics & Vestibular system; Optics; Muscle

32 hrs Seminars: Lung & Pneumonia; Cardiovascular System; Aortic stenosis; Renal function & failure; GI tract & Celiac disease; Gastric ulcer; Diabetes mellitus; Pain & Migraine; Synaptic pathophysiology & Myasthenia gravis pseudoparalytica; Motor system; Hypothalamic regulation.

28 hrs „Integrated" seminars

- *Endocrinology, e.g.* Acromegaly; Cushing syndrome; Prolactinoma; Hyperthyreosis;
- *Pediatric Pathophysiology, e.g.* Anemias; Cystic fibrosis; Hypothermia
- *Neuronal De- & Regeneration, e.g.* Parkinson´s disease; Inner ear degeneration;

28 hrs Pathophysiology lecture, e,g. Anemia; Leukemia; Bleeding disorders; Renal failure; Renal artery stenosis; Arteriosclerosis; Arthritis; Osteoporosis; Motor system; Adrenal failure; Pulmonary emphysema

Teaching Medical Physiology in Finnish Universities

Liisa M. Peltonen
Departement of Biomedicine/Physiology, 00014 University of Helsinki and
The Finnish Physiological Society, Helsinki, Finland

Medical education is available in five universities in Finland: Helsinki, Turku, Tampere, Kuopio and Oulu. While the core of physiology is common and well defined in all units, there flourishes greater academic freedom in the practice of teaching.
Generally, there are two basic strategies for teaching physiology, "independent" and "integrated" strategy. Independence means teaching and learning bodily functions autonomously in specific physiology courses. Integration means incorporating physiology to medicine and clinical practice right from the beginning of medical studies. Currently, only Tampere has an integrated curriculum and Oulu a traditional, indepent one. Thus, the mixture of the two basic strategies ("hybrid") seems to be the most common approach to teaching medical physiology in Finland.

Fig. 1. Different approaches to introducing physiology in tradtional and integrated curriculi (by courtesy of Professor Pirjo Saransaari,

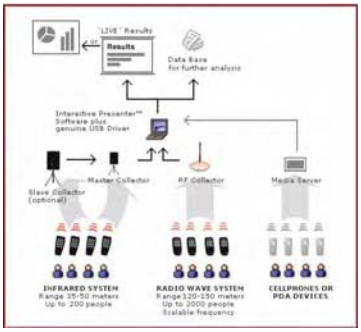

Fig. 2. Basic elements of Interactive Presenter® (http://www.interactivepresenter.com/)

Traditional approach relies on lectures and hands-on practicals in small groups. Uniquely, scientific writing seems to be included only in the tradetional curriculum. In Oulu, physiology course includes over hundred hours of lectures. In Kuopio, there are even more, 135 hours. The amount of lecturing is smallest in Tampere and in Helsinki (40 to 50 hours) as both faculties use problem-based learning as the principal learning method. Lectures have often been criticised of being passivating and therefore ineffective. However, the positive impact of lectures on students can be increased by making the student-centred and interactive. Innovative technology may provide an opportunity to two-way communication, e.g. when using personal digital transmitters (www.Interactivepresenter.com)

Research at the University of Oulu has revealed that using interactive equipment produced better learning (Uhari et al., 2003). It also increased activity during lectures, made making questions easier, increased the incidence of experiencing exciting insights, and made lectures less boring.
It seems that lecture remains the principal teaching method while physiology teaching is under-funded and under-occupied.
Despite various methods used in contact teaching, self-learning makes up most of the study hours, or it is supposed to do so. In Helsinki and Kuopio, faculty supports this motivation by offering special facilities ("Bazaar" and "Medistudia") for it. They are equipped with computers with access to multimedia programs and internet, anatomical models and phantoms, even a "common room" lirary with recommended and supplementary literature. They are also open beyond office-hours to meet the student's life style.
Physiology has always leaned on learning by doing, and it is a common belief that live demonstration of the basic principals of bodily functions improves learning. Every medical faculty in Finland has hands on practicals of cardiac and circulatory function, respiration, physical performance and neurology. In Turku, the amount of practicals is the highest, over 40 hours/student/year. It seems that participation in laboratory exercises in a given field is beneficial indeed. A small-scale study in pharmacology revealed that participation in a particular lab exercise increased the score of right answers to corresponding questions.

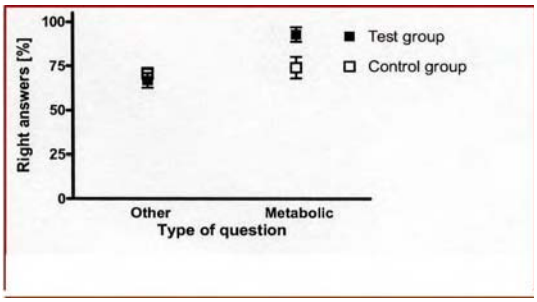

Fig. 3. Effect of participation in lab exercise dealing with drug metabolism on performance in examns (Juvonen et al., available in http://www.interactivepresenter.com)

In all types of curriculi, assessment of the quality of the education is of crucial importance for the follow-up of the outcomes of chosen strategies. The best taken care of is the evaluation of factual knowledge (amount) by course examens and by annual tests of accumulative knowledge (progress test; Tampere and Helsinki). Practical skills and the ability to apply knowledge are also evaluated. In Tampere, also attitude and interaction skills are assessed by personal learning diaries and video interviews. Learning process may be evaluated in teach-ins and by course feedback, and

teaching/education in general by student and peer feedback. Unfortunately, comparative research on the outcomes of different teaching methods is not common.
For self-learning, medical faculties recommend several text books. The most popular are Berne & Levy (Mosby), Ganong (Lange/McGraw Hill), Boron & Boulpaep (Elsevier Saunders), Rhoades & Tanner (Little Brown Company), Guyton & Hall (Saunders), Pocock & Richards (Oxford University Press) and Bear et al. (Williams & Wilkins).

In summary, the extent and content of physiology education is comparable at all medical faculties in Finland. With the exceptions of Helsinki and Tampere, lectures of physiology comprise more than 100 hours. The hands-on practicals include blood pressure, electro-cardiography, auscultation, spirometry, physical exercise, sensory physiology and electroencephalography. The major differences are seen in the integration of physiology with other disciplines and in the use of PBL and early patient contacts as teaching methods. In the monitoring and developing of teaching, student feedback has an important role in all universities.

References:

Juvonen RO, Turrek M, Ripatti I, Männistö PT and Raasmaja A. An interactive presenter computer program in teaching of drug metabolism to small groups of medical students.
Http://www.interactivepresenter.com

Närhi M & Leppäluoto J (2004). Lääketieteellisen fysiologian opetus Suomessa (in Finnish). Newsletter 4, Finnish Physiological Society, Helsinki.

Peltonen LM, Närhi M and Leppäluoto J (2005). Teaching Medical Physiology in Finnish Universities: five Faculties, Five Practical Approaches. Joint International Meeting of The Physiological Society and FEPS, Teaching Workshop, University of Bristol, UK. 222P.

Uhari M, Renko M and Soini H (2003). Experiences of using an interactive audience response system in lectures.
BMC Medical Education 3: 12. Available from http://www.biomedcentral.com/1472-6920/3

Medical Physiology Teaching in Italy and New Experiences in the Bari Medical School

Francesco Vitiello and Carlo Di Benedetta
Dipartimento di Farmacologia e Fisiologia Umana, Medical School of the Bari University (Italy)

In Italy the duration of M.D. degree studies is six years. Medical Schools students, who are selected on the basis of a *numerus clausus* dictated by community needs and availability of both facilities and teaching and technical personnel, are usually subdivided into groups. The curriculum is made up of 360 credits (60/year), each credit consisting of teaching as well as self-learning for a total amount of 25 hours. Teaching activities include formal lectures, practical demonstrations and tutorial group activities.
In the Medical Schools subject matters are distinguished into two categories (i.e., basic and clinically-related). Physiology teaching pertains to the basic sector. The number of credits assigned to physiology teaching varies between 13 and 21 among the several Italian medical schools, while the semesters devoted to this teaching range from 2 to 3 within the 2nd and 3rd year of the curriculum. Sometimes physiology is taught also in the successive academic years as propaedeutic to clinical teaching. The number of students in the different schools varies according to the size of the medical school and its *numerus clausus*.
The Dentistry School and several three-year courses, covering different topics of medical education like Nursing, Dietetics, Medical Laboratory Techniques, etc. (see Table I), as well as many postgraduate curricula, like research doctorates and postgraduate schools, are attached to the Medical School; all of them include physiology teaching, even though with different amount of credits.

Table I: Three-year "Degree Courses" activated by the Medical School of Bari. The number of hours assigned to Physiology varies from 10 to 50 in the different Courses.

Schools of Health Related Professions	Degree Course
Nursing and Midwifery Health Professions	Nursing*
	Midwifery*
Physical and Psychiatric Rehabilitation Health Professions	Physical Therapy*
	Speech and Launguage Sciences*
	Orthoptics and Ophthalmic Assistance*
	Professional Education
	Psychiatric Rehabilitation Techniques
Technical Health Professions	Dietetics
	Dental Hygiene
	Audiometric Techniques*
	Audioprosthetics*
	Medical Laboratory Techniques*
	Cardio-Circulatory Physiopathology and Cardiovascular Perfusion Techniques
	Neurophysiopathology Techniques
	Medical Radiology, Imaging and Radiotherapy Techniques
Disease Prevention Health Professions	Environmental and Occupational Disease Control
	Public Health
Physical Education and Sport Science	Physical Education and Sport Science

* for these Courses a two-year second level Course is also activated, which is intended to award a "Specialistic Degree".

As regards physiology teaching within the Bari Medical School, two students' groups ("channels") exist which include a total of 327 students. Twenty credits are assigned over three semesters (second semester of the second undergraduate year, and the first and second semester of the third year). In Table II the organization of the Course is given.

Table II: Programme of the three semesters including Physiology teaching.

Semester	Topics
First (six credits)	Physiology of Nerve and Muscle
	Interactions between Excitable Tissues
	Sensory and Motor Functions of the Spinal Cord
	Digestive System Physiology
	Nutrition
Second (six credits)	Respiratory, Cardiovascular and Renal Physiology
	Salt and Water Balance
	Regulation of the Circulation
	Regulation of the Respiration
	Physiology of Body Fluids and Acid-Base Homeostasis
Third (six credits)	Central Nervous System
	Sense Organ Physiology
	Vegetative Physiology
	Interactions between Central Nervous and Endocrine Systems

One credit is assigned to the teaching of Bioengineering and one more credit is earned, in the 4th and 5th year, in the Cardiology and Neurology courses (half credit each). Finally some elective courses are offered to the students.
The assessment is based on written (multiple-choice questionnaire) and oral examinations.
The didactic organization of the course of physiology relies on giving students detailed information regarding the functioning of the structures (cell and organ physiology) before discussing the systemic regulations of body functions. A similar organization is also adopted in the other Italian Medical Schools.
Participation of physiology lecturers in the Cardiology and Neurology courses is a starting point of an approach, which is likely to be enlarged in a later phase, intended to foster a closer cultural collaboration between physiology and clinical teaching. Such a cooperation is deemed necessary to give students the essential information for a better and deeper understanding of clinical notions.
New experiences have been explored at Bari Medical School. The University of Bari Medical School has built up a parallel track and adopted and experienced the methodologies regarding the PBL (Problem Based Learning) and COE (Community-Oriented Education).
Problem-Based Learning is a method by which learning is achieved through solving biomedical or clinical problems. All the activities performed during the curriculum (and the way they are performed) allow students to be also capable of organizing their own learning skills in order to continue their education in their future professional life.
Community-Based Education is a learning activity carried out in health and social services. This implies attending hospitals' emergency wards and general practitioner offices, and participating in family attachment programmes, in community health education activities, etc.
This methodology allows students to acquire not only the capability 'to know', but also 'to know how to be' and 'to know how to behave'.

Ec Tempus Programme-Co.Le.M. Project JEP-1756-*Don't get nervous from nerves* (1994) 1-56.
Berlucchi G and Di Benedetta C (1999) The harmonization of physiology teaching: a tool for its recognition in European countries. *Pflügers Archiv Eur. (J. Phys.)*1-3.

Teaching of Physiology in Hungary. Are the problems local or general?

György Benedek
Department of Physiology, Faculty of Medicine, University of Szeged, Hungary

The purpose of this presentation is to overview the situation relating to the teaching of physiology at Hungarian medical faculties. Hungary, a country with about 10 million inhabitants, has four universities with medical faculties, from which about 800 students graduate yearly. The author has the impression that most of the problems mentioned here are of general interest and do not apply merely within the borders of Hungary. A specific description of physiology training in Hungary was provided by Professor Emil Monos in 1998.

The first question that arises is: why we teach physiology at all. Some claim that even the existence of physiology is questionable (see the paper by Pinter and Pinter: "Is physiology a dying principle?" Physiology has lost much of its earlier importance because of the victorious advance of molecular biology on every front. This is clearly seen in the dwindling support for integrative (or organ or systems) physiology worldwide. In 2000, physiology departments in the US received only 2.6 % of the overall NIH support to medical schools.

A declining trend of physiology research may likewise be observed in Hungary. Molecular biology and genetics are gaining an increasingly dominant share of the funds available for basic research. Fortunately, no trace of this trend can yet be detected in physiology teaching. It is still of outstanding importance in the training of medical students at all four Hungarian medical faculties, where medical students are taught in a fairly high volume in the second year of medical studies at all the universities(Table I) The overall number of hours of physiology teaching account for about 6-9% of the medical curriculum (20 of the overall 300 credits). This is a considerable figure if we consider that the financing of the departments in Hungary roughly parallels the number of hours (or credits) provided by a given department.

Table I.

		Physiology hours/week			Physiology hours/semester			Exam	Sum of hours
	semester	lectures	seminars	practicals	lectures	seminars	practicals		
University of Debrecen	1/II	4	3	2	60	45	30	SCE	270
	2/II	4	3	2	60	45	30	final	
Semmelweis University Budapest	1/II	6		5	90		75	SCE	322.5
	2/II	6		4.5	90		67.5	final	
University of Pécs	1/II	5		3	75		45	SCE	255
	2/II	5		4	75		60	final	
University of Szeged	1/II	6	2	2	90	30	30	SCE	270
	2/II	4	2	2	60	30	30	final	

This high share of physiology in the medical curriculum is certainly due to the traditional weight of physiology departments in medical training and in part to the fact that neuroscience, for instance, is taught as a separate discipline only in Debrecen.

What do we teach as physiology? The question *per se* seems naive since all physicians have firm ideas as to the subject and content of medical physiology. Nonetheless, lecturers in physiology face the problems of what should be lectured and what should be emphasized. With the availability of excellent handbook and internet material, even the viability of lecturing traditions may be challenged. The lecturer is tempted to introduce physiological phenomena from a historical perspective. It seems reasonable from a gnostic viewpoint to present the major discoveries in the way the researchers originally accomplished them. Nowadays, a clinical approach with the use of case-reports to introduce the problem or a strictly biochemical/molecular biological approach is favoured. Fortunately, the easy access to handbooks and internet material exempts the lecturer from lectures covering the whole material and dealing with every topic that could be of interest during later clinical studies.

The total of 150 hours of physiology lectures in Szeged is distributes ad shown in Table II.
There are serious problems with laboratory practicals in physiology, which are held in small groups for 2 hours a week In roughly half of these practicals, physiological phenomena are demonstrated. Until recent years, the students performed classical experiments and observed demonstrations, including frog sciatic preparation, Trendelenburg preparation, Straub heart, isolated mammalian (guinea-pig) heart preparation, etc. The other type of physiology practicals deals with basic laboratory and medical skills. This is where medical students first learn to perform venapuncture, auscultation over the heart, neurological reflex examinations or ophthalmoscopy. Most students like these practicals. Unfortunately, however, there are doubts and questions concerning both types of practicals.

Table II.

Pricniples of control theory	2
Cell physiology	6
Muscle (cross-striated, smooth)	2
Physiology of blood, including 6 hours of immunology	14
Physiology of the heart	10
Circulation	16
Respiration	8
Endocrine and reproductive system	16
Renal physiology	14
pH regulation	2
Gastrointestinal physiology	12
Nutrition and metabolism	8
Work and sport physiology	2
Physiology of motor control	10
Physiology of the autonomic nervous system	6
Sensory physiology, including somatosensation, vision, hearing, taste, olfaction	12
Integrative physiology and psychophysiology	10
Altogether	**150 hours**

Work on experimental animals is the subject of severe criticism, among others from animal rights movements. The dramatic reduction in animal experiments in physiology teaching is a general trend throughout the world (see Tansey, 1998). This will evidently lead to the elimination of animal experimentation in medical training.
Practice in basic medical and laboratory skills is threatened by legal problems. There is always the danger of infections, even if the students adhere to the regulations. This is another reason why we are pushed towards the use of computer models and animated movies in the practicals.
The personal background of physiology teaching presents a tendency that is similar to international trends, Thirty-five years ago, all but one of the teachers at the Department of Physiology in Szeged had a medical degree. This seemed to be ideal under the circumstances et that time. In 2005, however, one-third of the tenured teachers have another type of training background (two pharmacists, one electrical engineer and three biologists). It is obvious that, not merely in Hungary, but in most Departments of Physiology throughout Europe, fewer and fewer medical graduates are entering the teaching/ research profession after obtaining their MD. There is no problem with non-doctors graduates performing the laboratory research work, since the graduate training in scientific professions is at a reasonably high standard in Hungary. The traditional theoretical and laboratory training, however, is not tenable against this background for a considerable time. This reasoning indicates the necessity to change the traditional teaching ways.
All in all, the scope does not seem to be too bleak. All five physiology departments in Hungary are pursuing research activity at an acceptably high level, which ensures a similarly high level of teaching, This reflects what Humboldt thought to be the purpose of universities “To serve science through research and teaching”.

References

Monos E: Why do we teach and learn physiology the way we do? An analysis of national circumstances. Report from Hungary Adv Physiol Educ 19: (1) 38-40 (1998)

Pinter GG and Pinter V: Is physiology a dying discipline? News in Physiological Sciences 8: 94-97 (1993)

Tansey E.M. “The Queen has been dreadfully shocked”: Aspects of teaching experimental physiology using animals in Britain, 1876-1986. Adv. Physiol. Sci. 19: 18-33 (1998)

New experiences in teaching Physiology through a PBL approach

L.H.E.H. Snoeckx and G.J. van der Vusse
Department of Physiology, Faculty of Medicine, Maastricht University, The Netherlands

From 1974 on, the educational approach of the Medical Faculty of the Maastricht University has been student-centered via problem-, project-, and patient-based learning. Courses are organized in thematic, multidisciplinary educational units, and focus on organ systems, life stages, (patho)-physiological principles, and/or chronic disorders. These are explored by the students using problem-based learning (PBL), project work, presentations, poster-sessions, etc. During the first years in order to achieve their learning objectives they cooperate in small, so-called tutorial groups. Clinical skills are permanently trained throughout the curriculum. The latest revised version of the medical curriculum is characterized by a more gradual transition from theoretical learning to clinical training. Special attention is paid to the promotion of the student's professional behavior. Assessment of knowledge is considered as a learning tool.

Problem-based learning has been forwarded as a more modern learning method, by which common medical problems are used as the vehicle for the study of basic medical sciences. Upon reading and discussing the problem, students themselves decide what information they need to understand the basic science underlying the case, and to solve the problem. As such basic sciences are learned in their context. Various studies have compared PBL with conventional teaching methods (CT). In contrast to PBL, CT is teacher-centered and can be associated with a lower motivation to study than in PBL. Furthermore, CT relies more on rote learning, while PBL promotes active learning, an effect of which is a better retention of knowledge. Because PBL is based upon an integrative, multidisciplinary approach, and uses a problem-solving approach, the applicability, respectively relevance of gathered knowledge is higher than in CT. Because in PBL students learn to manage how they gather their information, and learn in a more progressive way, the professional behavior leading to a life-long learning attitude is promoted.

To illustrate the latest, revised curriculum which started in 2001, we will show how physiological principles are learned in a first year unit (block), in which more emphasis is put on theoretical learning. We will compare this with a 4th year clinical clerkship, in which a basic science like Physiology is integrated both in the introductory and final wrap-up week. In the program of the first year, the main theme is emergency care and regulatory systems. Therefore, a large input of physiological knowledge on body homeostasis is crucial. There are 6 blocks of 6 weeks each concentrating on emergencies (1.1), traumata (1.2), dyspnoea (1.3), shock (1.4), abdomen (1.5) and unconsciousness (1.6), respectively. In 4 of these blocks, physiology is one of the key disciplines, and thus heavily involved in the organization of each of them. A typical week consists of two tutorial meetings of 2 hours each, 2 hours of clinical skills training, two lectures of 2 hours each, 2 hours of patient encounters, a practical session of about 2 hours, time to prepare a presentation or to work on an assignment, and time for individual or group study. The tutorial group typically consists of 10 students and one faculty tutor, who is 'content-competent'. The tutorial group is composed at random for each block. Students elect a fellow student as chairman for each session and use the so-called seven-jump as major tool to handle the proposed problem, which is, in most cases, an ill patient. This seven-jump consists of: (1) clarifying of unknown terms and concepts; (2) defining the real problem; (3) generation of explanations during the brainstorm phase; (4) arranging the proposed explanations; (5) formulation of learning objectives; (6) filling of the gaps in knowledge through individual study, and finally (7) reporting the backgrounds of the problem. The first 5 steps are taken during the first tutorial meeting, the last one during the first part of the second meeting. The latter is also the session during which the tutor can remediate misconceptions, if present. As such, during each block about 12 cases can be discussed and underlying basic knowledge studied.

The first year unit or block we like to illustrate is the 4th one, which concentrates on various forms of shock, such as cardiogenic, anaphylactic, hypovolemic, septic and emotional shock. Participating organizing disciplines were physiology (overall coordination), pharmacology/toxicology, anatomy/embryology, cardiology, and skills lab. Tutors were selected from the same departments, as well as from Surgery, Pathology, Biophysics, Internal Medicine, and Medical Sociology. Within the limits of the above mentioned shock topics the physiologist proposes to his colleagues of the planning group the essential physiological knowledge to be transferred. Together with the proposals of the other disciplines a realistic but virtual patient case is developed, in which the learning objectives are integrated. The case has to be written as such that students are invited and motivated to start a thorough discussion. Furthermore, it should allow the students to formulate accurate learning goals. From the 12 PBL cases in this block, the following (part of case presentation) illustrates the physiological content on how the kidney regulates blood pressure and volume and how this can be transferred via a relevant patient case.

"One day after admission to the hospital for cardiogenic shock, Mr. Simmons is conscious again and has a blood pressure of 90/60 mmHg. Although he receives a continuous i.v. infusion, he does not urinate. Therefore, a nephrologist is consulted. He suggests that the GFR is inadequate and that this probably due to acute tubular necrosis in the kidneys. The lack of oxygen has probably damaged the endothelium, leading to tubular obstruction with cell debris and, hence, lack of urine production. Aside from that, he suspects that the urine production is limited by hormones, the production of which must have been stimulated after the myocardial infarction insult. These hormones support, among others, blood pressure and volume. He proposes to wait a few more hours before taking any further action"

Before the start of the block the faculty tutors have received both oral and written instructions on how the case should be discussed and which learning objectives are essential. In this particular case they have been instructed that students

should concentrate upon the consequences of cardiogenic shock for kidney function and upon the role of the RAAS and ADH in the maintenance of blood pressure, respectively blood volume. The students can be stimulated to formulate the following problems: what is the functional anatomy of the kidneys; what is the relation between the kidney function and blood pressure; how can the kidney function be related to the heart problem; which hormonal reactions occur as a consequence of myocardial infarction; what is the function of RAAS and ADH and where are these hormones produced. Essential learning goals are: consequences of hypoperfusion for kidney function, function and regulation of ADH and RAAS synthesis and release, and the role of the kidney in the regulation of blood pressure and volume. Aside from the possible steering by the tutors, students receive learning sources, which can consist of text books, recent publications, review articles or interesting websites. Supporting activities consist – among others – of training of the skills for blood pressure measurement, heart and urine examination, and i.v. infusion on a model. Furthermore, practical sessions on the clinical anatomy of the heart, histology of the normal and diseased heart, microscopic anatomy of the normal and diseased kidney are organized as well as a computer simulation program showing the blood pressure regulation through the activity of the autonomic nervous system (Cardiolab). Finally, after having finished studying the learning goals the students receive a lecture on clinical anatomy of the heart and thorax, as well as of the kidney. At the end of the block all students are evaluated through a cognitive test that may include true/false items, multiple choice questions, a short essay, as well as through two assignments, linked to the practical sessions.

In the fourth year of their medical education, the Maastricht students enter in a carousel of clinical clerkships in groups of about 10 students each. In this year there are two major clerkships in which Physiology is recapitulated as a supporting basic discipline, i.e. in the Surgery and Internal Medicine clerkships. The practical clinical work in these clerkships is performed over a period of 8 weeks each, and is preceded and followed by an introductory and a final wrap-up week, respectively. During the introductory week, students are specifically prepared for their tasks during the clerkship. Among others, a whole morning is spent on the recapitulation of patho-physiological problems via highly interactive lectures for small groups of 10 students each. Considerable time is spent at interpreting laboratory data and activation of basic knowledge. Then students are asked to individually prepare a lecture on a patient that they will meet during the clerkship and to reflect on the underlying patho-physiological problem. This lecture has to be presented for their peer group in the wrap-up week after the clerkship. Both a physiologist and clinician attend these presentations and discuss, together with all the students, the issues raised during the lectures. Feed-back is given orally and via written comments. Based upon these comments, the students receive a grade which is added to the grades received on other clerkship-related evaluations.

Aside from the block-specific and clerkship-related evaluations, the students are also evaluated 4 times a year via a written progress test. This is a summative cognition test that samples the full domain of medical knowledge required at graduation (the so-called 'MD exam'). This test consists of about 250 true/false items contributed by all departments and mainly clustered according to organ systems. Because all students of the faculty receive the same test, it is clear that freshmen students will reach much lower grades than 6th year students. This is taken into account by relating the individual students' result to the average results obtained by his year group. Typical scores increase from about 15% good minus false at the end of the first year to about 60% at the end of the 6th year. For comparison, a group of residents in training takes the same examination. Over the last 20 years their grades are found to be comparable to or slightly higher than those of 6th year students. For thorough analysis the computer-generated results can be subdivided in categories, so that it is possible to discern the summative results on the various disciplines, like Physiology.

Ongoing internal and external evaluation of the Maastricht medical curriculum will finally learn whether PBL is a better knowledge transfer carrier than the more classical discipline-oriented transfer. At present, comparison of the summative evaluation via the 4 monthly test, which is carried out simultaneously at medical faculties in 3 Dutch universities does not provide exclusive evidence for a better (or worse) learning result of PBL in Maastricht. However, in a comparison between the results of Maastricht and Groningen students, the latter of which still follow a more classical discipline oriented curriculum, Maastricht students obtain significantly better results on OSCE (Objective Structured Clinical Encounter) tests. Aside from this, annual interviews of students learn that PBL is by far preferred over the more classical way of learning.

Interesting links referring to the Maastricht Medical Educational Program:

- Faculty of Medicine, Maastricht University: www.fdg.unimaas.nl
- New Curriculum 2001 - 2007: www.fdg.unimaas.nl/bib/curriculum2001
- PBL-information: www.unimaas.nl/pbl
- Skills Lab: www.fdg.unimaas.nl/sk/maarten
- Department of Educational Development & Research: www.educ.unimaas.nl/

Confidence-Based Marking: encouraging rigour through assessment

A.R. Gardner-Medwin
Dept. Physiology, University College London, UK

Students, especially medical students, have a lot to learn and a lot of assessments. Many able students find that they can do well without much thought - since the first idea they think of in answer to a question usually has a good chance of being correct, and this approach can get them good marks in exams. This tends to reward rote-learning, and a superficial approach. Confidence-based marking (CBM), in which a student must indicate confidence in each answer and be graded according to a properly motivating mark scheme, helps to encourage reflection, justification and rigour. It rewards both justification to the point of high confidence and the ability to identify reasons for reservation about an answer, and it therefore encourages a more rigorous approach both to learning and assessment. Experience at UCL and Imperial College over many years has shown that students find the concept and our marking scheme easy to understand, fair, and a stimulus to learning. Our dissemination programme is designed to encourage uptake in other universities and other disciplines, wherever students encounter questions to which the answers can be marked as right or wrong.

Our scheme for CBM is simple: confidence is rated 1, 2 or 3 and the marks awarded for correct answers are the same: 1, 2 or 3. Incorrect answers receive penalties of 0, -2 or -6. This graded negative marking rewards a student who can discriminate reliable from uncertain knowledge. Highest marks are obtained by choosing C=1 if the probability of being correct is <67% and C=3 if it is >80%. The features that students appreciate are that it correctly distinguishes sound knowledge from a lucky guess, and it deservedly penalises confident misconceptions more than ignorance. In summative assessments it has greater reliability and validity than marking based simply on the numbers of correct answers (Gardner-Medwin & Gahan, 2003). It improves signal-to-noise ratios by reducing the weighting of answers based on uncertain knowledge, which are associated with high variance. It shows no evidence for gender bias in practised students -- a concern sometimes volunteered by people on first hearing of CBM. CBM avoids a serious hazard that arises with use of a conventional fixed negative marking scheme (+/-1) with true/false questions, which can disadvantage students who have the insight to see when there are reasons for reservation, or who are simply diffident, or who take too literally advice that they should refrain from guessing (Gardner-Medwin, 1999).

There are simple arrangements for staff and students in new institutions to experience CBM in practice and to develop, adapt and run existing exercises based on their own material. The software can either be used via the UCL website (www.ucl.ac.uk/lapt) or can be copied elsewhere. For summative tests requiring invigilation we prefer to use Optical Mark Reader technology, for which cards implementing CBM for either True/False or multiple choice (pick one from A-E) questions are available from UCL and can currently be processed by UCL. Other question types (e.g. extended matching sets) can be handled with cards available from Speedwell Computing Services (www.speedwell.co.uk).

Those interested in reading further, and experiencing Confidence-Based Marking or trying it out with their students, should look at the website http://www.ucl.ac.uk/lapt .

Acknowledgement:
Supported by HEFCE through the Fund for the Development of Teaching and Learning, Phase 4.

Gardner-Medwin A.R. & Gahan M. (2003) *Formative and Summative Confidence-Based Assessment.* Seventh International Computer-Aided Assessment Conference Proceedings, Loughborough University, UK, pp. 147-155 (www.caaconference.com)

Gardner-Medwin, A.R. (1999) *Rational and irrational marking schemes.* Journal of Physiology, 515P: 48P

List of contents of Acta Physiologica Scandinavica December 2005, Volume 185 Issue 4