



ZIHP News

Zurich Center for Integrative Human Physiology

10-2013 • October 2013

Functional food and health: another fascinating topic of the Vision 2020 series



Marta Figueiredo

Have you ever taken energy drinks to recharge your batteries? Or tried to overcome the next flu season by enhancing your immune system taking probiotic supplements? Functional food is a topic of great controversy in Europe: What kind of products are in the category of functional food? What are the legal requirements?

The first speaker of the spring semester 2013 edition of the Vision 2020 series was → **Prof. Liisa Lähteenmäki** from Aarhus University in Denmark. She introduced the concept of functional food: What has to be the health benefit of a product to be classified as functional food? The highlight of Prof. Lähteenmäki's talk was the consumers perception of functional food: People often don't realize what the special benefits are. Therefore, clear labels and clarity in health-related message are crucial.

→ **Prof. Ingo Potrykus**, co-inventor and promoter of a genetically modified rice that biosynthesizes the precursor of vitamin A – the so-called «Golden Rice» – was our second speaker. Prof. Potrykus emphasized

that deficiencies of micronutrients as for example vitamins are a major cause of disease and mortality in the developing world. Thus, the concept of biofortified rice could be a solution in developing countries where rice is the staple diet. However, the marketing of «Golden Rice» in these countries is full of difficulties and challenges. The main problems come from the regulatory authorities and the opposition of the public to genetically modified organisms.

To close this seminar series, → **Prof. Christophe Lacroix** from the Institute of Food, Nutrition and Health at the ETH Zurich was talking about probiotics and their function. First of all, he clarified concepts like prebiotics, probiotics and synbiotics and mentioned the benefits these products offer

to the gut microbiota. Furthermore, he shared with us his research on the microorganisms responsible for probiotic products. He fascinated everyone with his in-vitro fermentation models that he uses to study probiotic bacteria. Unfortunately, the restrictive European law on functional food, in particularly on probiotics, does not only affect industrial production but also research in this field.

This semester's topic is → «Aging». The next lecture will be on October 17, 2013 with Stephen J. Matlin, CEO of Life Length, Madrid, Spain.

The series is organized by a committee of PhD students of the → **PhD Program in Integrative Molecular Medicine (imMed)** and supported by the SUK Program «Doktoratsprogramme».

VISION 2020 - A PERSONAL PERSPECTIVE
AGING

Thursday, October 17, 2013, 17:00 h
Lecture Hall Y16 G05
University of Zurich, Irchel Campus
Stephen J. Matlin
CEO of Life Length
Madrid, Spain

Life Length and Telomeres, A Key Biomarker For Aging and Health

Die Herbstausgabe von
WISSEN-SCHAFT F WISSEN

ZIHP-Mitglieder und ihre Forschungspartner präsentieren aktuelle Themen aus den Bereichen Physiologie und Medizin und laden die interessierte Öffentlichkeit zur Diskussion ein.

Montags von 18:15 - 19:45 Uhr
Eintritt frei!
Universität Zürich Zentrum,
Rämistrasse 71, 8006 Zürich
Hörsaal KOL-F-101

11. November 2013
→ **Blutdoping: Einfach, wirkungsvoll und kaum nachweisbar!**
Prof. Carsten Lundby, ZIHP-Assistenzprofessor an der UZH

21. Oktober 2013
→ **Leben unter Schwerkraft: Braucht jede Zelle die Schwerkraft?**
Prof. Oliver Ullrich, Anatomisches Institut der UZH

2. Dezember 2013
→ **Kokain und das Ego: Soziales Denken und Handeln bei Kokainkonsumenten**
Prof. Boris Quednow, Psychiatrische Universitätsklinik Zürich

New ZIHP members

- Prof. Dr. Martin Flück, Orthopaedic Research, Balgrist University Hospital as full member
- Dr. Bigna Lenggenhager, Department of Neurology, USZ as junior member
- Dr. Joachim Mertens, Division of Gastroenterology and Hepatology, USZ as junior member

New ZIHP cooperative projects for the period 2014-2015

Four new ZIHP cooperative project grants were awarded for the period 2014-2015. Basic and clinically-oriented researchers bring together their combined expertise and create an added value. All projects have a strong focus on the education of young scientists. They combine research on the level of molecules, cells, organs and the whole organism to gain insight into the complex functions of the human body.

→ **Impairment of the blood-brain barrier: Evaluation of the effect of pharmacological postconditioning**

Volatile anesthetics such as sevoflurane have been shown to be protective in various organs such as heart, liver and lung in situations of oxygen depletion. However, sparse information is available with regard to sevoflurane-induced brain protection. With this cooperative project the possibly positive impact of sevoflurane application after the onset of injury on the integrity of the blood-brain barrier in a cell model, in vivo

as well as in patients with brain hemorrhage will be elucidated.

→ **Gene x „invironment“ interactions in chronic inflammatory disorders**

Over the past few years the gut microbiota has been identified as an essential factor in the regulation of host metabolic and immune homeostasis. This cooperative project will investigate the influence of polymorphisms in NLR family, pyrin domain containing 3 (Nlrp3) and protein tyrosine phosphatase 2 (Ptpn2) on the gut microbiota composition and the resulting consequences on inflammatory bowel diseases, type 2 diabetes and inflammation associated fatigue.

→ **Immune regulatory functions of milk oligosaccharides**

Breast milk provides all nutrients required for the ideal growth and development of the newborn child, including components, such as oligosaccharides, which contribute to the microbiotic colonization of the intestine and to the development of

mucosal immunity. The objectives of this cooperative project are to characterize the effects of specific milk oligosaccharides on mucosal immune cells in humans and mice. This will contribute to the definition of novel infant formula including stimulatory oligosaccharides.

→ **Glutamate homeostasis in brain's reward centers, its disturbances in cocaine addiction, and novel treatment strategies targeting at the restoration of the physiological state**

Cocaine addiction is a devastating disorder with harmful psychological, physical, and social consequences. Currently, there is no approved pharmacological treatment available. It will be investigated whether similar neurometabolic changes in the brain's reward centers as in animal models are observed in humans addicted to cocaine and if the physiological metabolic state can be restored by a pharmacological intervention resulting in a reduced desire to use cocaine.

Events

- October 14, 2013 - ZIHP Special Seminar
 → **O₂ sensing: causes and consequences**
 Prof. Nanduri R. Prabhakar, Institute for Integrative Physiology & Center for Systems Biology of O₂ Sensing, University of Chicago, Illinois, USA
- October 14, 2013
 → **Epigenetics regulating our cells and mind in health and disease**
 Prof. Dr. Steffen Gay, Department of Rheumatology, University Hospital Zurich
- October 14, 2013
 → **Smart and fast: Physiological functions of protein kinase D in brain and skeletal muscle**
 Dr. Angelika Hausser, Institute of Cell Biology and Immunology, University of Stuttgart, Germany
- October 15, 2013
 → **Exocrine pancreatic amino acid transport in health and disease**
 Dr. Simone M. R. Camargo, Institute of Physiology, UZH
17. Oktober 2013
 → **Eröffnungssymposium Schlaganfallzentrum Zürich**
- October 17, 2013 - Vision 2020
 → **Life length and telomeres, a key biomarker for aging and health**
 Stephen J. Matlin, CEO of Life Length, Madrid, Spain
- October 17, 2013
 → **New family of phosphorescent probes for imaging tissue oxygen**
 Prof. Dr. Dmitri B. Papkovsky, University College Cork, Ireland
17. Oktober 2013
 → **Auswirkungen der personalisierten Medizin auf die Diagnostik und Behandlung genetisch bedingter Augenkrankheiten**
 Prof. Dr. Wolfgang Berger, UZH und Christina Fasser, Retina International
- October 21, 2013
 → **Interaction between the immune system and cancer**
 Prof. Dr. Maries van den Broek, Department of Oncology, USZ
- October 21, 2013
 → **HIV, mitochondria and renal Fanconi syndrome**
 Prof. Dr. Andrew Hall, Institute of Anatomy, UZH
21. Oktober 2013 - Wissen-schaf(f)t Wissen
 → **Leben unter Schwerkraft: Braucht jede Zelle die Schwerkraft?**
 Prof. Oliver Ullrich, Anatomisches Institut der UZH
- October 22, 2013 - ZIHP Lunch Seminar
 → **Conformational PARTiality, the receptor's multiple choice**
 PD Dr. Reto A. Schüpbach, Division of Surgical Intensive Care Medicine, USZ
24. Oktober 2013
 → **6. Zürcher Herbstsymposium in Klinischer Ernährung – «Brennpunkte 2013»**
24. Oktober 2013
 → **5. Neuromuskuläres Symposium**
- October 28, 2013 - PhD Thesis Defense
 → **Glutamatergic and dopaminergic mechanisms of sleep-wake regulation in healthy humans**
 Sebastian Holst, Institute of Pharmacology and Toxicology, UZH
- October 28, 2013
 → **Manifestations and consequences of cobalamin disorders: the contribution of cell and animal models to dissect the underlying molecular mechanism**
 Prof. Dr. Jean-Louis Guéant, Reference Centre for Inborn Errors of Metabolism, CHU de Nancy Hopitaux de Brabois, France
- October 28, 2013
 → **Tales of obfuscation and error in clinical research**
 Prof. Dr. Peter Jüni, Institute of Social and Preventive Medicine and Clinical Trials Unit (CTU), University of Bern
28. Oktober 2013
 → **Gesund sterben. Was uns die Medizin von morgen bringt**
 Beatrice Beck Schimmer, Anästhesistin und Holger Moch, Pathologie
- October 29, 2013
 → **Extra-adrenal synthesis of immunoregulatory glucocorticoids in the intestinal epithelium**
 Prof. Dr. Thomas Brunner, Biochemische Pharmakologie, Universität Konstanz
- October 29, 2013
 → **Myocardial fibrogenesis in the inflammatory cardiomyopathy**
 Dr. Gabriela Kania, Division of Rheumatology, USZ
- October 31, 2013 - ZIHP Special Seminar
 → **Regulation of IL-1beta-induced inflammatory signaling by hydroxylases**
 Dr. Carsten Scholz, Systems Biology Ireland, Conway Institute, University College Dublin, Ireland
- October 31, 2013 - ZIHP Special Seminar
 → **Novel anti-fibrotic mechanisms regulating TGFbeta1 signaling in renal epithelia**
 Dr. Karen Nolan, Diabetes Research Centre, Conway Institute, University College Dublin, Ireland
- November 5, 2013 - ZIHP Lunch Seminar
 → **STA-MCA bypass: who will benefit most?**
 PD Dr. Oliver Bozinov, Division of Neurosurgery, USZ
- November 5, 2013
 → **MiR 17-92 cluster DNA repair**
 Dr. Daniela Hühn, Institut für Molekulare Krebsforschung, UZH
7. November 2013
 → **5. Forum Dialog Psychiatrie-Neurologie**
- November 11, 2013 - PhD Thesis Defense
 → **Congenital and ethanol-induced disorders of N-linked protein glycosylation**
 Michael Welti, Inst. of Physiology, UZH
- November 11, 2013
 → **Probing protein conformational changes in health and disease**
 Prof. Dr. Paola Picotti, Institute of Biochemistry, ETH Zurich
11. Nov. 2013 - Wissen-schaf(f)t Wissen
 → **Blutdoping: Einfach, wirkungsvoll und kaum nachweisbar!**
 Prof. Carsten Lundby, ZIHP-Assistenzprofessor an der UZH
- November 12, 2013
 → **Immediate improvement of HDL properties and endothelial function after RYGB surgery in obese patients and rodents**
 Dr. Elena Osto, Cardiovascular Research, Institute of Physiology, UZH
- November 12, 2013
 → **DNA repair**
 Prof. Dr. Alessandro Sartori, Institut für Molekulare Krebsforschung, UZH

Press review

→ Koffeinkonsum verlangsamt Hirnentwicklung

Während der Pubertät schlafen Menschen und andere Säugetiere besonders intensiv. In dieser Phase reift auch das Gehirn am schnellsten. Doch wenn pubertierende Ratten Koffein erhalten, verzögern sich die Reifungsprozesse in ihrem Hirn. Zu diesem Ergebnis gelangt eine Studie des ZIHP-Mitglieds Reto Huber.

Medienmitteilung des Schweizerischen Nationalfonds, 24. Sept. 2013

→ «Bei Einschlafschwierigkeiten wird es problematisch»

Tages-Anzeiger, 24. September 2013

→ «Mit 84 ein Springinsfeld»

Das medizinische Wissen wächst, die Therapien werden immer besser: Werden wir künftig gesund sterben? Und zu welchem Preis? Eine Diskussion mit Beatrice Beck Schimmer, Flurin Condrau und Ralph Kunz.

Magazin. Die Zeitschrift der Universität Zürich, 16. September 2013

→ Wenn Fliegen Bauchweh macht

Patienten mit chronisch entzündlichem Darm machen oft die Erfahrung, dass es nach einer Reise zu Entzündungsschüben kommt. Die Hauptrolle spielt dabei nicht der Reisetress, sondern der Sauerstoffmangel im Flugzeug oder während Aufenthalt im Gebirge. Zu diesem Schluss gelangt eine vom SNF unterstützte Studie der ZIHP-Mitglieder Stephan Vavricka und Gerhard Rogler.

Medienmitteilung des Schweizerischen Nationalfonds, 16. Sept. 2013

→ Polyvalente Zwerg

Nanopartikel sind winzig klein, haben aber ein grosses medizinisches Potenzial. Ob diese tatsächlich für die Blutreinigung oder zur Bekämpfung von Tumoren verwendet werden können, untersucht ZIHP-Mitglied Beatrice Beck Schimmer.

Magazin. Die Zeitschrift der Universität Zürich, 16. September 2013

→ Forschungsnahes Lernen und Lehren: Kreativer Exploit im Zweierbüro

Dabei zu sein, wo Entdeckungen gemacht werden, gibt dem Studium die Würze. In einer zweiteiligen Serie zeigt das «Journal», wie vielfältig die Möglichkeiten sind, an der UZH forschungsnah zu lehren und zu lernen, beispielsweise in einer eng betreuten Abschlussarbeit bei der ZIHP-Forscherin Elisabeth Eppler.

Journal. Die Zeitung der Universität Zürich, 16. September 2013

→ «Damit allen dieselben Türen offenstehen»

Der «Aktionsplan Chancengleichheit UZH» soll die Gleichstellung der Geschlechter an der Universität Zürich bis 2016 weiter voranbringen. ZIHP-Mitglied Beatrice Beck Schimmer stellte an der Kick-off Veranstaltung das Projekt der Medizinischen Fakultät vor.

UZH News, 13. September 2013

imMed PhD Program – new students

Since the last recruitment round 13 new PhD students who were accepted to the PhD Program in Integrative Molecular Medicine (imMed) started their work here in Zurich. Welcome!

Bombardo Marta, Division of Visceral and Transplant Surgery Research, USZ

Flück Joëlle, Institute of Veterinary Physiology, UZH

Francia Simona, Institute of Veterinary Physiology, UZH

Gehlen Manuel, Institute of Physiology, UZH

Greco Francesco, Neonatology, University Children's Hospital Zurich

Haarmann Anke, Institute of Physiology, UZH

Keiser Stefanie, Institute of Physiology, UZH

Langiewicz Magda, Division of Visceral and Transplant Surgery Research, USZ

Liao Wan-Hui, Institute of Anatomy, UZH

Olinger Eric, Institute of Physiology, UZH

Song Zhuolun, Division of Visceral and Transplant Surgery Research, USZ

Whitehead Marek, Institute of Physiology, UZH

Zanoni Paolo, Institute of Clinical Chemistry, USZ

From the editor's desk

Christina Giger is back from her maternity leave. Welcome back!

A big thank you to Evelyne Kloter who supported the → ZIHP Coordinating Office during this time.

Recent publications

- Abegg K, Schiesser M, Lutz TA, Bueter M: → **Acute peripheral GLP-1 receptor agonism or antagonism does not alter energy expenditure in rats after Roux-en-Y gastric bypass**. *Physiol Behav* [Epub ahead of print], 2013
- Bogdanova A, Makhro A, Wang J, Lipp P, Kaestner L: → **Calcium in red blood cells-a perilous balance**. *Int J Mol Sci* 14(5): 9848-72, 2013
- Borsig L, Wolf MJ, Roblek M, Lorentzen A, Heikenwalder M: → **Inflammatory chemokines and metastasis-tracing the accessory**. *Oncogene* [Epub ahead of print], 2013
- Brugger P, Lenggenhager B, Giummarra MJ: → **Xenomelia: a social neuroscience view of altered bodily self-consciousness**. *Front Psychol* 4: 204, 2013
- Devuyt O, Rippe B: → **Water transport across the peritoneal membrane**. *Kidney Int* [Epub ahead of print], 2013
- Eckardt KU, Coresh J, Devuyt O, Johnson RJ, Köttgen A, Levey AS, Levin A: → **Evolving importance of kidney disease: from subspecialty to global health burden**. *Lancet* 382(9887): 158-69, 2013
- Forster IC, Hernando N, Biber J, Murer H: → **Phosphate transporters of the SLC20 and SLC34 families**. *Mol Aspects Med* 34(2-3): 386-95, 2013
- Glaudemans B, Terryn S, Gözl N, Brunati M, Cattaneo A, Bachi A, Al-Qusairi L, Ziegler U, Staub O, Rampoldi L, Devuyt O: → **A primary culture system of mouse thick ascending limb cells with preserved function and uromodulin processing**. *Pflugers Arch* [Epub ahead of print], 2013
- Hansen CF, Bueter M, Theis N, Lutz T, Paulsen S, Dalbøge LS, Vrang N, Jelsing J: → **Hypertrophy dependent doubling of L-cells in Roux-en-Y gastric bypass operated rats**. *PLoS One* 8(6): e65696, 2013
- Herrmann IK, Castellon M, Schwartz DE, Hasler M, Urner M, Hu G, Minshall RD, Beck-Schimmer B: → **Volatile Anesthetics Improve Survival after Cecal Ligation and Puncture**. *Anesthesiology* [Epub ahead of print], 2013
- Imprint
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- Jacobs RA, Flück D, Bonne TC, Bürgi S, Christensen PM, Toigo M, Lundby C: → **Improvements in exercise performance with high-intensity interval training coincide with an increase in skeletal muscle mitochondrial content and function**. *J Appl Physiol* (1985) 115(6): 785-93, 2013
- Jordi J, Herzog B, Camargo SM, Boyle CN, Lutz TA, Verrey F: → **Specific Amino Acids Inhibit Food Intake via the Area Postrema or Vagal Afferents**. *J Physiol* [Epub ahead of print], 2013
- Knevel R, Klein K, Somers K, Ospelt C, Houwing-Duistermaat JJ, van Nies JA, de Rooy DP, de Bock L, Kurreeman FA, Schonkeren J, Stoeken-Rijsbergen G, Helmer Q, van der Linden MP, Kern M, Manjarrez-Orduno N, Rodriguez-Rodriguez L, Stinissen P, Huizinga TW, Toes RE, Gay S, Gregersen PK, Somers V, van der Helm-van Mil AH: → **Identification of a genetic variant for joint damage progression in autoantibody-positive rheumatoid arthritis**. *Ann Rheum Dis* [Epub ahead of print], 2013
- Kucian K, Ashkenazi SS, Hänggi J, Rotzer S, Jäncke L, Martin E, von Aster M: → **Developmental dyscalculia: a dysconnection syndrome?**. *Brain Struct Funct* [Epub ahead of print], 2013
- Mamlouk S, Kalucka J, Singh RP, Franke K, Muschter A, Langer A, Jakob C, Gassmann M, Baretton GB, Wielockx B: → **Loss of prollyl hydroxylase-2 in myeloid cells and T-lymphocytes impairs tumor development**. *Int J Cancer* [Epub ahead of print], 2013
- Mey L, Hörmann M, Schleicher N, Reuter P, Dönges S, Kinscherf R, Gassmann M, Gerriets T, Al-Fakhri N: → **Neuropilin-1 modulates vascular endothelial growth factor-induced poly(ADP-ribose)-polymerase leading to reduced cerebrovascular apoptosis**. *Neurobiol Dis* 59: 111-25, 2013
- Olini N, Kurth S, Huber R: → **The effects of caffeine on sleep and maturational markers in the rat**. *PLoS One* 8(9): e72539, 2013
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- Plichta MM, Wolf I, Hohmann S, Baummeister S, Boecker R, Schwarz AJ, Zangl M, Mier D, Diener C, Meyer P, Holz N, Ruf M, Gerchen MF, Bernal-Casas D, Kolev V, Yordanova J, Flor H, Laucht M, Banaschewski T, Kirsch P, Meyer-Lindenberg A, Brandeis D: → **Simultaneous EEG and fMRI Reveals a Causally Connected Subcortical-Cortical Network during Reward Anticipation**. *J Neurosci* 33(36): 14526-14533, 2013
- Ravera S, Murer H, Forster IC: → **An Externally Accessible Linker Region in the Sodium-Coupled Phosphate Transporter PiT-1 (SLC20A1) is Important for Transport Function**. *Cell Physiol Biochem* 32(1): 187-99, 2013
- Regan Anderson TM, Peacock DL, Daniel AR, Hubbard GK, Lofgren KA, Girard BJ, Schörg A, Hoogewijs D, Wenger RH, Seagroves TN, Lange CA: → **Breast Tumor Kinase (Brk/PTK6) Is a Mediator of Hypoxia-Associated Breast Cancer Progression**. *Cancer Res* [Epub ahead of print], 2013
- Spescha RD, Sessa M, Camici GG: → **Angiopoietin-like 4 and ischaemic stroke: a promising start**. *Eur Heart J* [Epub ahead of print], 2013
- Spliethoff K, Meier D, Aeberli I, Gassmann M, Langhans W, Maggiorini M, Lutz TA, Goetze O: → **Reduced insulin sensitivity as a marker for acute mountain sickness**. *High Alt Med Biol* 14(3): 240-50, 2013
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