

# ZIHP *News*

Zurich Center for Integrative Human Physiology

9-2012 • September 2012

## Around sleep, heart disease, cell growth and hypoxia – insights from the 8<sup>th</sup> ZIHP Symposium

Christina Lange

Surrounded by sleepy faces, Prof. Derk-Jan Dijk from the University of Surrey, UK, started the morning session with his keynote lecture about circadian rhythms and sleep. He shook up the audience with the message that self-perceived sleep quality is among the most influential factors determining the quality of life. Insufficient sleep makes you sleepy but, surprisingly, the ability to think and fulfill sophisticated tasks appears less influenced by the duration of sleep.

Also, Prof. Dijk reported that artificial light in the evening and even light emitted from television and computer screens makes us want to stay awake longer than we should. Exposure to artificial light in the evening contributes to insufficient sleep in modern societies. Sleeping behaviour is also imprinted in our genes: One mutation in a gene called *Per3* contributes to your tendency to be a «morning type», «evening type» or something in between.

Furthermore, there are many misconceptions concerning sleep, for example it is often thought that during daytime older people are sleepier



than young people. Wrong! It is actually the younger people who should stay in bed for longer than they do. Derk-Jan Dijk also explained that if one takes an early evening nap, it is harder to fall asleep at night. His conclusion: «Don't sleep too little, but also don't sleep too much!».

The morning session was continued by four presentations of young researchers from a broad variety of fields within human physiology. The talks covered topics like zebrafish models of infantile nystagmus syndrome, anorexia in cancer patients, the transcriptional regulation of certain receptors on macrophages and the involvement of different genes in kidney cancer.

### From liver disease to cardiovascular complications

After a short but refreshing coffee break, Prof. Bart Staels from the University of Lille 2, France, held his keynote lecture about metabolic syndrome and its cardiovascular complications. He focussed his discussion on non-alcoholic fatty liver disease (NAFLD) which includes non-alcoholic steatohepatitis (NASH).

«In the western world with all the fatty and sugary food, nowadays there are kids that develop NASH already at the age of sixteen to eighteen», Prof. Staels reported. A patient with NASH has, apart from other consequences, an increased risk of cardiovascular disease. Bart Staels

and his co-workers used mouse models to mimic NASH. They reported on the role of the PPAR nuclear receptors in controlling the disease which also influences vascular inflammation. Knowing this relationship they are now targeting this specific receptor with an agonist in order to treat NASH and its associated cardiovascular risk.

The late morning session was completed with another four interesting talks from young scientist on topics such as tissue factor mutations and the consequences for male and female mice, signalling pathways in inflammatory bowel disease, the treatment of pulmonary hypertension in a mouse model and cerebral blood flow through electroencephalographic activity in the human brain.

**Lively discussions at the posters and the secrets of muscle growth**

The science day was continued with a delicious lunch buffet and fruitful discussions at the sixty-one posters of young researchers from different groups, most of them affiliated to the ZIHP.

The afternoon session opened with another fascinating keynote lecture given by «Mr. TOR» Prof. Michael N. Hall from the Biozentrum Basel. Target of rapamycin (TOR) controls cell and body size. Flies mutant for TOR are much smaller than normal flies. This is not because they have fewer cells, but because they have smaller cells.

Prof. Hall presented the advertisement of «AnaTOR», a commercial anabolic product that should enhance muscle growth through the TOR pathway. «It probably only contains the amino acid leucine», Hall argued.



Leucine is needed for glutamate dehydrogenase to form alpha-ketoglutarate out of glutamate. Hall and his co-workers found that alpha-ketoglutarate is a key factor for the activation of the TOR pathway and therefore cell and muscle growth.

ImMed PhD student Fabio Aimi from the Division of Internal Medicine at the USZ continued to talk about TOR and showed how he was able to normalize tumor vasculature by deleting endothelial TOR complex in a mouse model. He won the award for best presentation for his excellent talk. Congratulations, Fabio!

**The pros and cons of adaptation**

After a short coffee break with tasty pastry, the talks of the young researchers on erythropoiesis, delayed cortical maturation after coffee intake and the consequences of serotonin action on pancreatitis continued.

The last keynote speaker, Prof. Josef T. Prchal from the University of Utah, USA, spoke about polycythemia, a disease which is hallmarked by the increased blood viscosity and at times increased risk of thrombosis due to a higher number in red blood cells. There are several causes for polycythemia, for example a stay at high altitude and the connected activation of erythropoietin due to hypoxia. But there are also genetic causes. A mutation of the Chuvash people in Russia

causes an abnormal structure of a certain protein - the von Hippel Lindau protein - , a very important player in the control of the production of red blood cells and other body functions regulated by low oxygen levels.

Prchal also studied Tibetans, people that live their whole life at very high altitude. They were perfectly adapted to the altitude and did not develop polycythemia: Ten adaptation genes were altered in the genome of Tibetans. But Prchal brought to mind: «As good as these mutations are at high altitude, as bad they can be at low altitude. Many Tibetans living in the lowlands of China may be at increased risk to develop obesity and diabetes.»

In her closing remarks to the symposium audience, Daniela Ernst from the Institute of Clinical Chemistry, USZ, shared her experience as a PhD student of the imMed PhD program. She complimented the program for building networks among PhD students from different institutes and clinics at the University of Zurich. She also mentioned that she appreciated the ZIHP Symposium as a very pleasant event that brings people together in a relaxed atmosphere.

→ Photo album of the 8<sup>th</sup> ZIHP Symposium

## The physiological control of eating and drinking

Zurich was the proud host of the → **Annual Meeting of the Society for the Study of Ingestive Behavior (SSIB)**. The meeting took place from July 10-14, 2012 at the ETH Zurich and was organized by ZIHP member and President of the SSIB Thomas Lutz (Institute of Veterinary Physiology, UZH) with the help of ZIHP member Wolfgang Langhans (Institute of Food, Nutrition and Health, ETHZ). The meeting attracted more than 300 scientists to come to Zurich, including the world leaders in the field.

### From basic research to diseases

SSIB is recognized worldwide as the premier society that covers basic research of the physiological controls of eating, drinking and associated pathophysiological states like obesity and diabetes mellitus.

The scientific program of the SSIB meeting featured four plenary lectures by Lee Kaplan, Joel Elmquist, Steven C. Woods and Giacomo Rizzolatti, all world leaders in their research area, covering topics like bariatric surgery, brain controls of eating and adiposity signals to mirror neurons. Eight symposia and a large number of oral and poster research abstracts completed the full four-day program.

### Supporting young researchers

One of SSIB's major aims is to support young research fellows at the graduate student and early postdoctoral level. A number of specific events like a professional development lunch or a meet-the-professor lunch were organized to encourage the close interaction between young researchers and established leaders in our field.

### Special issue published

The abstracts of the meeting were published in «Appetite». Further, SSIB produces a special issue published in «Physiology and Behavior» each year. We are grateful that the ZIHP contributed to the publishing costs in 2012. For that reason, the name of the ZIHP will appear in a prominent position in these Elsevier publications.

Some colleagues from the UZH, USZ and ETHZ made use of our special offer to buy day pass tickets for the meeting. Those who came hopefully did enjoy the great science presented here in Zurich.

## Awards at the 8<sup>th</sup> ZIHP Symposium



The award for the best presentation at the 8<sup>th</sup> ZIHP Symposium was given to **Fabio Aimi** from the Division of Internal Medicine, USZ (leftmost).

Awards for the best posters were given to (from left to right): **Katrin Stadelmann**, Institute of Pharmacology

and Toxicology, UZH, **Patrick Forny**, Metabolism and Molecular Pediatrics, University Children's Hospital, **Rahel Sibler**, Institute of Clinical Chemistry, USZ, and **Pascal Hänggi**, Division of Haematology, University Children's Hospital. Congratulations!

## Events

17. September 2012

→ **Biologics**

Fort- und Weiterbildung Rheumaklinik  
Universitätsspital Zürich

18. September 2012

→ **Autonomieverständnis und das neue Erwachsenenschutzrecht**

Dialog Ethik, Universitätsspital Zürich

September 18, 2012

→ **The RhCG ammonia channel is important for maintaining systemic acid-base homeostasis**

Lisa Bounoure, Inst. of Physiology, UZH

24. September 2012

→ **Die Rolle von Zytokinen bei Immunerkrankungen**

Prof. Dr. Onur Boymann, Allergiestation der Dermatologischen Klinik, USZ

24. September 2012 - Antrittsvorlesung

→ **Apathie - nicht wollen oder nicht können?**

PD Dr. Stefan Kaiser, Psychiatrische  
Universitätsklinik Zürich

September 25, 2012

ZIHP Lunch Seminar

→ **Hey bHLH transcription factors control cardiovascular development**

Prof. Dr. Manfred Gessler, Dept. of Developmental Biochemistry, University of Würzburg, Germany

25. September 2012

→ **PAR, a Janus Faced Receptor?**

PD Dr. Reto Schüpbach, Intensivmedizin, USZ

27. September 2012

→ **Laboratoriumsdiagnostik von Erkrankungen des Bewegungsapparates**

Universitätsspital Zürich

27. September 2012 - Minisymposium

→ **Nephrologie: Spannendes Fach – Spannende Fälle**

Universitätsspital Zürich

September/Oktober 2012

→ **Fortbildung Neurologie**

September 28, 2012

PhD Thesis Defense

→ **The impact of hypoxia on aerobic exercise capacity**

Christoph Siebenmann, Institute of Physiology, UZH

October 2, 2012

→ **Basolateral amino acid efflux investigated using MDCK epithelia and mouse models**

Adriano Guetg, Inst. of Physiology, UZH

4. Oktober 2012

→ **4. Zürcher Symposium für Sportkardiologie**

Universitätsspital Zürich

October 9, 2012 - ZIHP Lunch Seminar

→ **Typical and atypical networks of memory and cognition in the developing brain**

PD Dr. Peter Klaver, MR Center, University Children's Hospital Zurich and Dept. of Psychology, UZH

15. Oktober 2012

→ **Claudin Tight Junction Proteins**

Prof. Dr. Dominik Müller, Klinik für Pädiatrie mit Schwerpunkt Nephrologie, Charité, Berlin

October 16, 2012

→ **SGLT inhibition as a therapeutic strategy for polycystic kidney disease**

Prof. Dr. Rudolf P. Wüthrich, Clinic for Nephrology, USZ and Institute of Physiology, UZH

## imMed PhD Program graduate course

The imMed PhD Program and the LSZGS jointly offer the following course:

November 29/30, 2012

→ **Applying statistical methods in biosciences**

Register now on the LSZGS website!

## New open PhD positions

→ **The potential of NMP to prevent osteoporosis and to enhance bone regeneration**

Division of Cranio-Maxillofacial and Oral Surgery/Bioengineering, USZ

→ **Early cardiovascular effects after RYGB surgery**

Institute of Veterinary Physiology, UZH

→ **more open positions**

## Congratulations!

Susanna Sluka, student of the imMed PhD Program won the

→ **Young Investigator Award** of the Working Group on Atherosclerosis and Vascular Biology of the European Society of Cardiology.

## imMed PhD Program – new students

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

Balbo Pogliano Chiara, Institute of Physiology, UZH

Becker Eugenia, Division of Gastroenterology and Hepatology, USZ

Kasper Stephanie, Div. of Gastroenterology and Hepatology / Dept. of Oncology, USZ

Leuenberger Caroline, Department of Intensive Care and Neonatology, University Children's Hospital Zurich / Institute of Veterinary Physiology, UZH

Liberini Claudia, Institute of Veterinary Physiology, UZH

Wehrle Flavia, Division of Neonatology, USZ

## Press review

### → Erste Ergebnisse eines Zürcher Versuchs bei Gelähmten

In Zürich wurden querschnittgelähmte Patienten im Rahmen einer Studie des Teams von ZIHP-Mitglied Armin Curt mit Stammzellen behandelt. Bis jetzt geben die Ergebnisse Anlass zu Hoffnung.

Neue Zürcher Zeitung,  
12. September 2012

### → Gut getarnte Designerdroge

Der jüngste Vorfall mit «Badesalz» hat die Diskussion um Designerdrogen neu entfacht. Wie verbreitet die Stoffe hierzulande sind, ist unklar. Ebenso, was sie im Gehirn der Konsumenten anrichten, sagt ZIHP-Mitglied Boris Quednow, Professor für Experimentelle und Klinische Pharmakopsychologie.

Tagesanzeiger, 5. September 2012

### → «Stricken ohne Wolle geht nicht»

Am Science Talk im Rahmen der Wissenschaftsausstellung Scientifica fragte die Schauspielerin Delia Mayer den Neuropsychologen und ZIHP-Forscher Lutz Jäncke, woher denn die Kreativität komme. Schnell war der zahlreich erschienenen Zuhörerschaft klar: Sie fällt nicht vom Himmel!

UZH News, 3. September 2012

### → Verraucht hier die Intelligenz?

Der regelmässige Konsum von Cannabis sollte in jungen Jahren möglichst vermieden werden. Das sagt der ZIHP-Forscher Boris Quednow. Zentralschweiz am Sonntag,  
2. September 2012

### → Vitamin-B12-Mangel: den Ursachen auf der Spur

Vitamin B12 ist lebenswichtig. Einem Team von Forschenden um das ZIHP-Mitglied Matthias R. Baumgartner ist es gelungen, die Ursache eines erblich bedingten Vitamin-B12-Mangels zu entschlüsseln.

Medienmitteilung der UZH,  
27. August 2012

### → Erfolgreich atmen

Wer seine sportliche Leistung verbessern möchte, der sollte auch an seine Atmungsmuskulatur denken. Wer diese gezielt mittrainiert, kann vor allem bei längeren Ausdauereinheiten noch einen Zahn zulegen, wie ZIHP-Forscherin Christina Spengler und ihr Team jetzt herausfanden.

ETH Life, 27. August 2012

### → Im Winterschlaf zum Weltrekord

Der Mensch kann sich in den Winterschlaf versetzen. Dabei befindet sich der Körper in einem Extremzustand, der künftig in der Medizin und im Sport zur Anwendung kommen könnte. Die dabei erreichten Werte erstaunen auch Forscher wie die ZIHP-Mitglieder Max Gassmann und Christina Spengler.

Fit for Life, 23. August 2012

### → Von der Entdeckung der körpereigenen Abwehr

Zur Eröffnung des 26. Endokrinologenkongresses an der Universität Zürich hielt der renommierte Nobelpreisträger Jules A. Hoffmann einen Gastvortrag über das von ihm entdeckte System der angeborenen Immunität. Organisiert wurde diese internationale Konferenz von ZIHP-Mitglied Elisabeth Eppler.

UZH News, 23. August 2012

### → Darmkrankheiten in den Griff bekommen

Das Team von ZIHP-Mitglied François Verrey hat zusammen mit Forschenden der Universität Wien den rätselhaften Zusammenhang zwischen Mangelernährung und chronischen Darmentzündungen geklärt. Die Studie wurde in der renommierten Wissenschaftszeitschrift «Nature» veröffentlicht.

UZH News, 21. August 2012

### → Weniger Krebs nach Herztransplantation

Laut einer neuen Studie schützen gängige Cholesterinsenker Patienten mit unterdrücktem Immunsystem möglicherweise vor Krebs. Die Ergebnisse müssen aber noch bestätigt werden, berichten die ZIHP-Forscher Georg Noll, Thomas F. Lüscher und Frank Ruschitzka in der Wissenschaftszeitschrift «Circulation».

Neue Zürcher Zeitung,  
8. August 2012

### → Wachmacher für Herz und Hirn: Wie Coffein wirkt

Wie das Coffein die Menschen wach hält, obwohl sie eigentlich immer müder werden, erforschen Wissenschaftler um das ZIHP-Mitglied Hanspeter Landolt. Doch warum hat das Coffein bei einigen Menschen überhaupt keine wachmachende Wirkung?

Quarks & Co, WDR Fernsehen,  
17. Juli 2012

## Recent publications

Fiechter M, Gebhard C, Ghadri JR, Fuchs TA, Pazhenkottil AP, Nkoulou RN, Herzog BA, Altorfer U, Gaemperli O, Kaufmann PA: → **Myocardial perfusion imaging with (13)N-Ammonia PET is a strong predictor for outcome.** *Int J Cardiol* [Epub ahead of print], 2012

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Landolt HP: → **«No Thanks, Coffee Keeps Me Awake»: Individual Caffeine Sensitivity Depends on ADORA2A Genotype.** *Sleep* 35(7): 899-900, 2012

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