SWISS NATIONAL CENTRE OF COMPETENCE IN RESEARCH

KIDNEY
CONTROL OF HOMEOSTASIS

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BUILDING SWITZERLAND'S NEXT GENERATION OF RENAL PHYSIOLOGISTS

Education and training play an important role within Kidney.CH. In Switzerland there is a long tradition of high quality research in renal physiology, thus it is our goal to train and help creating the next generation of renal physiologists and pathophysiologists, concentrating on homeostatic body functions where the kidneys play a central role.

The reductionist approach brought by cellular and molecular techniques had a strong impact on the education of researchers that were not anymore adequately trained in the classical (patho-) physiologic thinking and the corresponding functional techniques. To date there are no specific and comprehensive education programmes in renal physiology and pathophysiology offered in Switzerland. Renal physiology lectures are part of general physiology courses required for the bachelor in medicine or in medical biology. After the bachelor, medical students take some lectures, during the three years required for the master in medicine, in renal pathophysiology as well as clinical nephrology. However, students aiming for a PhD in life sciences usually have no or very little lectures in renal pathophysiology. Therefore, not only a general "unité de doctrine" is lacking, but also an integrative and translational view of renal physiology and pathophysiology, which to our view is crucial for the sustained advancement of young researchers in these fields. Here is where our education and training programme in integrative kidney physiology and pathophysiology (IKPP) steps in and closes a gap in the educational landscape of Switzerland.

The programme focuses on three pillars (› Fig. 1)

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University of Zurich[UZH]

FNSNF
Swiss National Science Foundation

EDITORIAL

Bernard Rossier
is professor emeritus and former director of the Dept. of Pharmacology and Toxicology and former Dean of the Faculty of Biology and Medicine of the University of Lausanne. He is executive member of the HSeT Foundation and a member of the Kidney.CH advisory board.

« Tell me and I forget.
Teach me and I remember.
Involve me and I learn... »
Benjamin Franklin, 1706-1790

Kidney.CH has set up a strong education and training program in Integrative Kidney Physiology and Pathophysiology (IKPP). The main goal is to create the next generation of renal physiologists (in the broadest sense) and to encourage them to undertake an academic career.
How can we involve students so that they will learn (and not just remember) the most important scientific principles that should guide them during all their career? According to my personal experience, two factors are critical to reach this goal:
1) program a series of inspiring lectures delivered by outstanding and enthusiastic speakers, role models in their specific field
2) involve the students in active and interactive learning activities. The «blended» e-learning module combining face-to-face meetings and distance learning activities that will be opened to the students next fall is well adapted to that aim, particularly to a class of students working in five, geographically distant, campus in Switzerland.
Involvement of enthusiastic students and teachers is the key for a successful learning. Benjamin Franklin probably would have agreed with that conclusion!

Bernard Rossier

EDUCATION	TRAININGS	JUNIOR GRANTS
PhD & Postdoc Programme Education in integrative kidney physiology and pathophysiology (IKPP) **E-Learning** Platform for distant learning in combination with face to face meetings	**Special courses in:** Publication writing Presentation skills Grant applications Leader skills Sensibilizing of gender issues etc.	**Competitive Junior Grant** Grants to foster young scientists for a next career step **Mini Sabbatical (protected time)** Grant to focus on research work, writing of habilitation, writing of grant applications, int. exchange and networking
Education in renal physiology	**Improvement of personal skills**	**Advancement of research career**

Fig. 1: The combination of education in renal physiology, training of transferable skills and support of personal research career shall help young scientist on their career path.

PORTRAIT

RESEARCH IS THE CREATIVE ELEMENT

Interview with Prof Reto Krapf

Reto Krapf, you are chairman of the Department of Medicine and professor of medicine at the State Hospital Bruderholz, Faculty of Medicine at the University of Basel. How did you choose to become a physician?
There was no tradition in my family of studying medicine. I had this picture of the general practitioner, as the one of our family, and decided to study medicine. After having finished my education I did a residency in pathology and in forensics at the University Hospital in Berne, Switzerland. After, I did several internships and residencies at different state and university hospitals in Switzerland before I moved to the US as research fellow. I went to join F.C. Rector at the Cardiovascular Research Institute of the University of California in San Francisco (UCSF). We, my wife and the three children stayed there for three years. The first two years I purely focused on research. I began to work with the technique of micro-perfusion of the proximal tubule. I then switched to the newly available techniques using non-toxic fluorescence dyes to measure intracellular pH variations and transport mechanisms; first on the proximal tubule and later on the Henle loop. In my third year at UCSF I became assistant professor of medicine and took over clinical duties as head of "renal clinic". Although we had an excellent time in San Francisco, we decided for personal reasons to go back to Switzerland. After four years back at University Hospital Berne I was elected as chief physician for internal medicine (clinic B) at the State Hospital of St. Gallen.

Do you still enjoy being a physician?
Yes, absolutely. It is fascinating to understand and apply the tremendous medical knowledge accumulated up to date on a patient by performing diagnosis, applying therapies and seeing the corresponding effects. Did the medication work as hypothesized? Was the therapy successful?

It is often said, a physician only needs to take care of patients. Is there an advantage for a physician in doing research?
Research always fascinated me and still does. Over the years, I kept doing research, as it is the creative element for my work! So I believe that doing research helps to be critical in what you are doing and planning. And this I see as a clear advantage for the clinical work. It helps trying to understand the cause instead of only treating the phenomenon. I therefore strongly recommend to my young doctors to do research at least for a year or two.

One can say you made a dream career. Who influenced you mostly? And what were key events on your career path?
On the scientific side, I was strongly influenced by Floyd Rector, Jr. and Robert Alpern at UCSF. On the clinical side there was Hugo Studer and Werner Staub from the University Hospital in Bern who stimulated my enthusiasm for internal medicine. I am privileged that my teachers and role models are still close friends.
But I also need to say that sometimes I was just lucky. I could publish early in good journals and was elected already with 38 as director at the State Hospital in St. Gallen.

At Kidney.CH you took over this year the responsibilities for the reference center "Human Studies". What are your hopes and visions for this?
My hope is to improve clinical research in the field of nephrology. I also wish to foster and improve the interactions of the different centers in Switzerland in a way to create a new culture to elaborate common protocols like they do with so much success for HIV cohort or the oncologists within the Swiss working group for clinical research (SAKK).

Reto Krapf
is chairman of the Department of Medicine and professor of medicine at the State Hospital Bruderholz, Faculty of Medicine at the University of Basel. He is member of the Kidney.CH steering committee and leads the reference center Human Study Group at NCCR Kidney.CH.

EDUCATION

Currently in Switzerland almost all PhD programmes are organized and run within local universities. They offer excellent training in cell and molecular biology among others, but no or very little training in renal physiology and pathophysiology. Participation to one of these locally recognized PhD programmes is often mandatory for PhD students and there is no Swiss-wide agreement about the roles and responsibilities of these programmes.

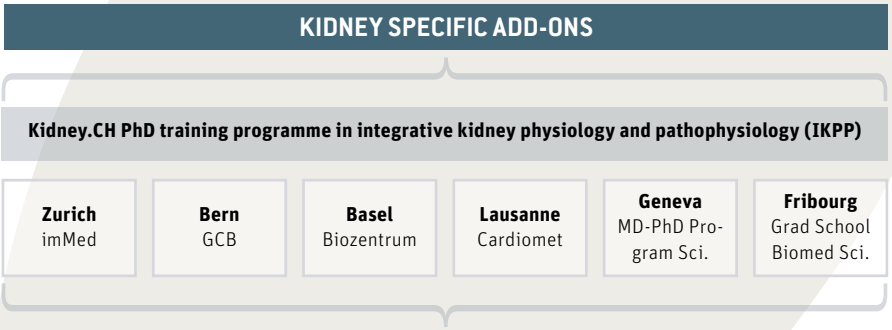

Fig. 2: Scheme of existing PhD programmes and Kidney.CH specific add-ons.

Our initiative therefore focuses on offering and building add-ons in kidney physiology and pathophysiology to these existing local PhD programmes. Our Kidney.CH PhD-students receive their basic training by attending the general lectures, seminars and courses (for example bio-informatics, imaging, genomics, proteomics, statistics etc.) at their local universities. In addition to these basic, locally based trainings, we offer lectures, seminars and workshops on kidney and homeostasis-related topics not well represented in the existing programmes.

Our special education programme with its specific add-ons is mandatory for all PhD students and postdocs enrolled in our NCCR Kidney.CH. But it is also open to other PhD students and MDs from NCCR associated research groups.

To reach our objectives of training the next generation of renal (patho-) physiologists, we combine a variety of educational tools, i.e. classical lectures, workshops and peer teaching, and eLearning. Currently we have four full lecture days scheduled per year, where "students" meet in Berne, which is reachable from all participating universities within a reasonable timeframe of less than two hours. Bringing all students and postdoctoral fellows together also creates an important platform for direct interactions.

The lecture days are based on a clinical case, which is discussed and presented in groups. The case is followed by formal lectures according to the day's specific learning topic, guided paper discussions and selected progress reports of NCCR projects. This structure guarantees the approach from bedside to bench and back, by choosing a "real life" story of a clinical case and thus allowing participants to think globally and integratively about the physiological and pathophysiological topics of the day. It also allows a learner-centered discussion to start the day.

KIDNEY.CH LECTURES

The lecture days are based on a clinical case, which is discussed and presented in groups. They are followed by formal lectures according to the day's specific learning topic, guided paper discussions and selected progress reports of NCCR projects.
Some selected teaching topics are:

- INTRODUCTION IN KIDNEY STRUCTURE & FUNCTION
- GLOMERULAR & TUBULAR FUNCTIONS
- HOMEOSTATIC KIDNEY FUNCTIONS
- KIDNEY INTERPLAY WITH ORGANS
- TUBULAR DYSFUNCTIONS
- BIOETHICS
- RENAL REPLACEMENTS
- SCIENTIFIC WRITING
- ANIMAL MODELS
- BIOINFORMATICS & -STATISTICS
- GLOMERULAR DISORDERS

E-LEARNING

To support the teaching of the "lecture days", an eLearning course is currently being developed. To that purpose Kidney.CH and the Health Sciences eTraining Foundation (HSeT) joined forces last summer. HSeT is a specialist in the field of eLearning and already successfully runs an online platform. The content development will be under the lead of Bernard Rossier and Jean-Pierre Kraehenbuel in collaboration with specialists from NCCR Kidney.CH.

Starting with an article from the literature and/or with a practical problem we will review the theoretical principles necessary to understand the basis of the presented articles (article-based learning) or problems (problem-based learning). After the course, the trainee should be able to:

- describe and apply the basic physiological and pathophysiological concepts of nephrology to medically relevant questions.
- acquire basic anatomical knowledge (virtual microscope) to understand the functional anatomy of the nephron
- critically read, analyze and present a scientific paper and address the unsolved questions.

A first course shall be available by the end of this year.

CAREER TRAININGS

Goal of this tool is to support our young scientists in advancing their personal skills. Besides the wide range of events offered at local universities, we offer selected topics of so-called transferable skills exclusively to our young scientists. This covers topics such as scientific writing, communication, grant application, conflict management and project management to name a few. Acquiring some transferable skills will help for both, careers in academia and industry.

COMPETITIVE JUNIOR GRANT

The step from a postdoctoral fellow to an independent researcher is often difficult. With our competitive junior grant we set up a tool aiming at facilitating this transition. By giving young academics the opportunity to design, implement and lead their own research projects within NCCR-Kidney.CH, this grant helps taking the next career step.

The financial support is of up to CHF 60'000 per year for the duration of maximum three years. The grant can't be used for own salaries. In addition, the associated institute needs to guarantee lab space, equipment, last and corresponding author rights to the junior and sufficient material support for the project.

We believe that the education and training activities setup at Kidney.CH will give our students and young scientists good opportunities for their career building.

Uyen Huynh-Do is senior consultant and professor at the University Hospital Berne. She leads the education programme and advancement of women at Kidney.CH

Jan Loffing is professor at University of Zurich. He is vice-director of Kidney.CH and, amongst others, supervises the education programme

STUDENT'S DAY

On the 22nd of March, the second Kidney.CH Student's Day took place in Berne. This excellent event was organized by three of our young researchers:

Mads Soerensen, University of Zurich, Mathilde Janot, University Hospital Berne and Jérémie Canonica, University of Lausanne (picture from left to right).

Topic in the morning was a capacity building workshop on IP and patent search where Prof Heinz Müller from the Swiss Institute of Intellectual Property and Dr Bernhard Hostettler from the Industry gave insights into the world of patents and how to extract useful information. The afternoon then was fully dedicated to kidney research with a brilliant mini-symposium entitled "from bench to bed side".

Prof Jens Leipziger from Aarhus University in Denmark spoke about luminal nucleotides and the regulation of epithelial transport. Prof Michael Köttgen from University of Freiburg, Germany informed on ABCG2, urate transport and gout and how he – by accident – came across ABCG2. Prof Peter Mathieson from the University of Bristol, UK then finished with insights into signalling within and between glomerular cells.

THANK YOU FELIX FREY!

In view of his retirement this summer, Felix Frey left Kidney.CH early 2012. We warmly thank Felix for his central contribution in planning and setting up Kidney.CH and for his fruitful contributions.
We wish you Felix all the very best for the future!

NEW PARTICIPANTS

With great pleasure we welcome Bruno Vogt and Andreas Serra as new associate participants of Kidney.CH. Bruno Vogt will as successor of Felix Frey be the new director of the Department of Nephrology and Hypertension at the Insel Hospital in Berne and he joins our research module Salt & Water. Andreas Serra is senior consultant at the Department of Nephrology at the University Hospital of Zurich and joins research module Nutrients & Metabolism.

JUNIOR GRANTS

Two candidates were selected for this year's junior grants. One grant went to Geneva to Thomas Ernandez for a study on the role of the primary cilium in flow-dependent regulation of sodium transport in the collecting duct. Another grant went to David Hoogewijs from Zurich to study the role of hypoxia-inducible cytoglobin in CKD. Congratulations to both!

Thomas Ernandez
is senior consultant at the Dept. of Nephrology at University Hospital Geneva. His junior grant project is integrated into module Salt & Water.

David Hoogewijs
is senior researcher at the University of Zurich. His junior grant project fits well into the research module Oxygen.

EVENTS

COMPANY VISIT: ESBATECH
June 29, 2012
Schlieren, Switzerland

NEXUS SYMPOSIUM 2012 – BONE AND THE KIDNEY
Sep 20 – 23, 2012
Copenhagen, Denmark

KONGRESS FÜR NEPHROLOGIE 2012: 4. JAHRESTAGUNG DER DEUTSCHEN GESELLSCHAFT FÜR NEPHROLOGIE
Oct 6 – 9, 2012
Hamburg, Germany

ASN KIDNEY WEEK 2012
Oct 30 – Nov 4, 2012
San Diego, CA, USA

44TH ANNUAL MEETING SWISS SOCIETY OF NEPHROLOGY
Dec 5 – 7, 2012
Zurich, Switzerland

Kidney – Control of Homeostasis is a Swiss research initiative, headquartered at University of Zurich, bringing together leading specialists in experimental and clinical nephrology and physiology from the Universities of Basel, Berne, Fribourg, Geneva, Lausanne and Zurich and corresponding University Hospitals.

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