SWISS NATIONAL CENTRE OF COMPETENCE IN RESEARCH

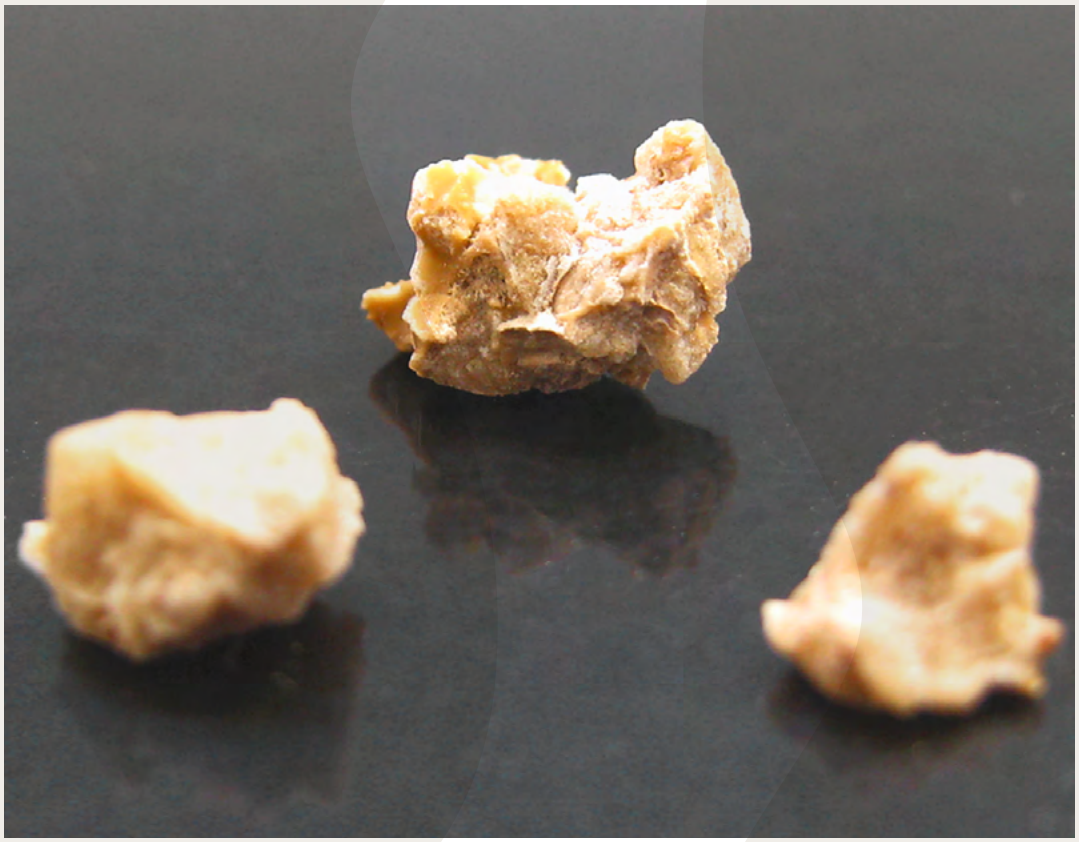
KIDNEY
CONTROL OF HOMEOSTASIS

NEWSLETTER ::: NO. 11 ::: DECEMBER 2015

Kidney—Control of Homeostasis is a Swiss research initiative, headquartered at University of Zurich, which brings 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.

NCCR Kidney.CH
Institute of Physiology
University of Zurich
Winterthurerstrasse 190
8057 Zurich | Switzerland
Tel: +41 44 635 5216
Fax: +41 44 635 6814
www.nccr-kidney.ch
info@nccr-kidney.ch

A BETTER UNDERSTANDING OF KIDNEY STONES



Although kidney stones are small they cause painful symptoms and could be an indicator of more severe conditions

Kidney stones are often seen as painful but trivial. They could however be an indicator of a profound disequilibrium of the body's metabolism or point at even more severe conditions such as hypertension, osteoporosis or cardiovascular and chronic kidney diseases.

Patients tend to underestimate the significance of kidney stones and rely on simple mechanistic explanations of stone formation. They often assume they just need some urological help to remove the stones. However, recent data suggests that kidney stones should be considered a warning sign: they form when the urine's chemistry is altered chronically, which could indicate a profound disequilibrium of the patient's body metabolism or could be a sign of non-optimal nutrition or lifestyle habits. Kidney stones may also be a sign of a more severe condition since they are associated with hypertension, osteoporosis and cardiovascular and chronic kidney diseases. In some rare cases, kidney stones are even caused by genetic diseases that may lead to renal failure.

All patients experiencing recurrent kidney stone episodes should therefore be thoroughly examined. Risk factors for kidney stone formation—as well as for bone, metabolic and cardiovascular diseases—need to be carefully assessed in stone formers. And

→

Pascal Houillier is a professor at Paris Descartes University and practices medicine at Georges Pompidou University Hospital; he is also a member of the NCCR's advisory board.

An example to other research initiatives

In the last two decades, biomedical research has evolved in such a way that inter-institutional and interdisciplinary collaboration has become almost indispensable to achieving groundbreaking results.
Not only can isolated groups rarely cover every aspect of a research programme, many decisive research questions in biomedicine can only derive from patient care. Furthermore, the ultimate validation of findings needs to come from clinical studies.

It seems that the NCCR Kidney.CH has been inspired by all those principles. It brings together renal clinicians and scientists and provides the variety of classical and innovative approaches needed in modern research. Most importantly, it is a forum where senior and junior experts meet regularly to discuss hypotheses and share results.
The NCCR also provides the framework necessary for building large cohorts of patients, which are mandatory when conducting research programmes on common and rare diseases and carrying out clinical trials.

The NCCR Kidney.CH is an excellent example of an ambitious and successful kidney research programme. It can be an inspiration to others, and similar initiatives should be implemented in other countries.

Pascal Houillier

proper management—including nutritional and physical activity advice, a correction of cardiovascular and metabolic risk factors, and a specific drug treatment—needs to be offered, with follow-up over time.

COLLECTING DATA ON KIDNEY STONE PATIENTS

The Swiss Kidney Stone Cohort (SKSC) was initiated in 2013, within the framework of the NCCR Kidney.CH and in collaboration with five Swiss university nephrology clinics. The objective of the cohort is to collect epidemiological data and biological samples from patients in Switzerland experiencing recurrent stone episodes, and thus to provide researchers with extensive material from these patients. At the beginning of the project, a common investigation protocol was established that encompasses the collection of epidemiologic, anthropomorphic, and biological data (DNA, blood, and urine). Participating patients need to collect two urine sample series, each comprising all urine passed during 24 hours; they also have to complete a five-day food diary and fill in questionnaires on frequency of food intake and physical activities. Patients' fresh morning urine is examined for the presence of crystals and a subset of patients have their pulse wave velocity measured, providing an index of the rigidity of the main arteries—indicative of cardiovascular risk. All the biological samples are analysed and bio-banked under a range of conditions (i.e. acidified and/or alkalinized urine, serum, and plasma). DNA is extracted and stored centrally.

Based on an initial analysis of the samples, the patients are given either dietetic advice and/or are treated with a suitable medication. After three months, the patient's adherence to the recommendations is checked and the effects of the therapy are re-evaluated and the therapy adjusted. Subsequently, and for up to ten years, annual follow-ups take place aiming to boost the patient's adherence to the therapy; in addition, cardiovascular and metabolic risk factors are checked and the remaining stone-burden is evaluated radiographically.

A 'WIN-WIN' RESEARCH PLATFORM

By participating in the Swiss Kidney Stone Cohort patients benefit by being closely monitored for their stone risk and for more general metabolic and cardiovascular risk factors. Researchers, meanwhile, have access to a range of high quality samples of urine and blood, respectively—including DNA, and to anthropomorphic and epidemiologic data from this extensive population of stone formers. Clinical nephrologists, for their part, benefit from the network and expertise of the five university centres.

So far, around 200 patients have been recruited and analyzed and have received follow-up for one year. A preliminary analysis of the data in September 2015 offered a first glimpse of patient characteristics, which led to two posters being presented at the annual meeting of the Swiss Society of Nephrology in December 2015. In addition, a first call for scientific projects using material from the cohort was launched and a nested study will be initiated. Data quality has also been monitored and results indicate a need to change the way in which nutritional status is being evaluated in the cohort. In particular, the need for a stronger involvement of dieticians in the management of patients has been identified as a critical factor.

KIDNEY STONE SYMPOSIUM—2016

A prestigious international advisory board has been elected to guide the cohort with regards to its long-term strategic goals and scientific projects. On February 25, 2016, this advisory board will meet for the first time, at an international kidney stone symposium in Bern. This event will be a unique opportunity to showcase the Swiss Kidney Stone Cohort and to inform nephrologists and general practitioners about new findings regarding kidney stones.

Olivier Bonny,
the leader of the SKSC is an assistant professor at the Department of Pharmacology and Toxicology of the University of Lausanne, Médecin Associé at the Service of Nephrology of Lausanne University Hospital, and an associated participant within the NCCR Kidney.CH

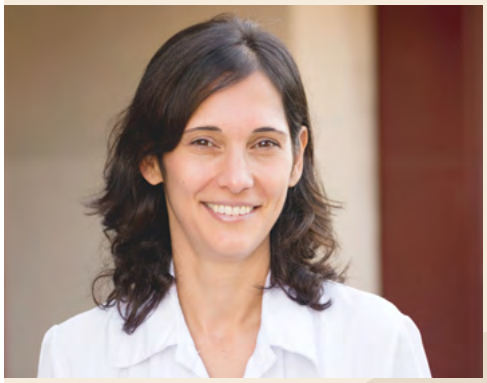
THE SWISS KIDNEY STONE COHORT:

GRAZIA CEREGHETTI: THE NEW SKSC COORDINATOR

The Swiss Kidney Stone Cohort welcomes Dr. Grazia Cereghetti as its new national coordinator. Cereghetti holds a PhD from ETH Zurich and was trained in the field of clinical trials at the Clinical Investigation Unit of the University Hospital of Geneva.

CAREERS WITHIN THE NCCR KIDNEY.CH

Scientist, clinician and mother—A follow-up interview with Sophie de Seigneux



Sophie de Seigneux was among the first recipients of an NCCR Kidney.CH Junior Grant. When she was awarded the grant in early 2011, she was just beginning to tackle the challenge of being a first-time mother on top of working as a clinician and researcher. In 2012 she also received an Ambizione Grant from the Swiss National Science Foundation. We ask her how her career has progressed since then.

Could you give us a short update as to what you have been doing over the last two years?

I was awarded a Professeur Boursier scholarship from the Swiss National Science Foundation and was appointed Médecin adjointe agregée (senior lecturer) at the Service of Nephrology at the University Hospital of Geneva. This allows me to dedicate half of my time to clinical work and the other half to research. While I pursue both basic scientific research and clinical studies on chronic kidney disease, I am also, at the clinic, responsible for consultations in general ambulatory nephrology and in genetic renal diseases. On the personal side, I had a second daughter—Emilie, who is now nine months old; Alicia is three and a half now.

How did the NCCR Kidney.CH Junior Grant and the Ambizione Grant advance your career?

Both grants allowed me to pursue my research and to publish some interesting papers, and they also led, in large part, to my being granted the Professeur Boursier scholarship. The grants were valuable not only because of their funding aspects, but also because they allowed me to build up a network. Networking, I think, is crucial and being part of the NCCR Kidney.CH helps a lot in this respect.

Having children is often seen as an obstacle to a woman's career. Your experience appears to prove that one can combine family and work. How do you manage?

I receive a lot of support, both from my husband and from my parents who help me take care of Alicia and Emilie. Flexible working hours and the understanding approach of my colleagues are also important factors.

Do you think that your field of research is male-dominated and offers fewer opportunities for women?

I'm not sure that Nephrology is more male-dominated than other areas of research. I do believe, however, that management positions are, in general, mostly occupied by men—in research and also in clinical medicine. At the moment, though, there seems to be a trend towards supporting women in sciences and to developing their medical careers.

'Advancement of women' as part of gender equality is an important topic in all public research fields. Did you have a mentor, or would you like to mentor young female scientists?

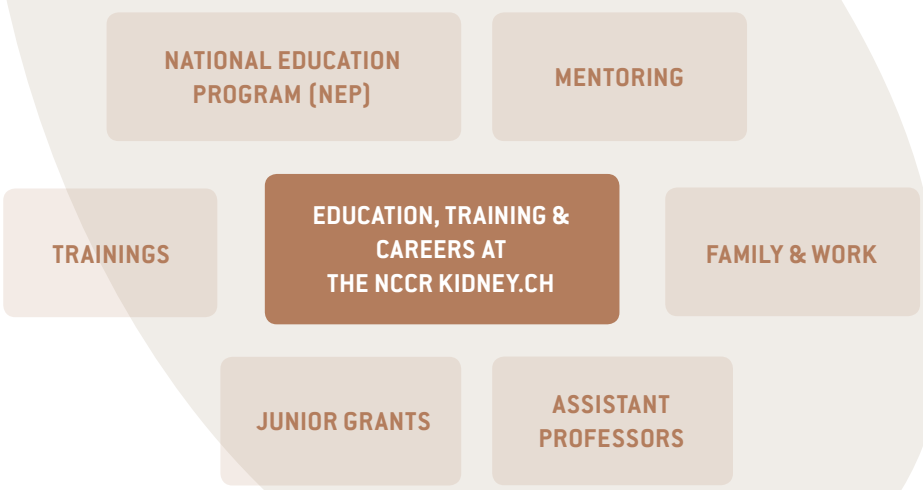
Yes, I was part of a mentorship programme and I'm currently mentoring both men and women interested in clinical work and research. Professor Pierre-Yves Martin was my mentor. He works in my scientific field and has been giving me good advice since I was a medical student. The commission de la relève in Geneva has also lent me their support.

Concerning family and career: What advice would you give young, female scientists who are wondering if a scientific career is compatible with having a family?

To become a successful scientist is difficult for both women and men. It is important to know early on in your career what you want to achieve. But you can't plan everything. You need to be lucky enough to meet people that truly want to promote young scientists and that will help you launch your career. Having children and a career is possible, but it requires a lot organizational skills and the support of your family—as I mentioned earlier.

Regarding your current projects: You have just been awarded an NCCR Kidney.CH Human/Clinical Project grant. What are your research interests?

My overall interest lies in the pathophysiology of chronic kidney disease. On the experimental level, I'm working on the role of proteinuria and hypoxia in CKD progression. On the clinical level, I focus on the role of mineral metabolism in CKD associated vascular disease, and I think this will become a major therapeutic goal. We are currently starting a study, in collaboration with Andreas Pasch, about the role of dialysis initiation on serum's propensity to calcify and about the effect on arterial wall properties. Thanks to the NCCR Kidney.CH, this study will start in Geneva, Lausanne and Zurich.



EDUCATION, TRAINING & CAREERS:

Education, training and career planning play an important role within the NCCR 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.

To reach our goal we follow a manifold approach by educating our young scientists in basics in kidney physiology and pathophysiology, giving support to balance family and work, and creating opportunities to advance personal careers.

JOINT NCCR WORKSHOP: STUDYING AND SHARING

Historical setting: Schloss Ueberstorf

From November 9 to November 11, 2015, the two NCCRs RNA & Disease and Transcure, in collaboration with Kidney.CH, organised the first joint workshop for young scientists, at Schloss Ueberstorf in the Canton of Fribourg.
An international team of three coaches from hfp-consulting trained 24 PhD students and postdocs in how to improve their presentation skills. To do so, participants had to learn to give a presentation without the aid of any electronic equipment. Participants also enhanced their interpersonal communication skills by learning how best to give competent feedback to others — a skill that can be used daily in the lab.
Feedback from the participants revealed that this joint workshop also provided an excellent opportunity for scientific exchange.

RESULTS OF THE 2ND HCP CALL

On October 21, 2015, the NCCR Kidney.CH Steering Committee approved three proposals for human/clinical and translational cooperative projects (HCP).

Overview of approved HCP projects
(Main applicant / project title)

Sophie De Seigneux (University of Geneva): Effect of dialysis initiation on serum calcification propensity.

Alex Odermatt (University of Basel): Investigations into the circulating factors regulating hepatectomy-induced phosphate wastage in man.

Olivier Devuyst (University of Zurich): Uromodulin as a biomarker for the risk of chronic kidney disease.

E-LEARNING MODULE 4 LAUNCHED: OXYGEN HOMEOSTASIS

On October 22, 2015, the 4th e-learning module — on the role of the kidney in oxygen homeostasis — was launched with a kick-off meeting in Bern. The NCCR Kidney.CH offers these modules in collaboration with the Health Science eTraining Foundation (HSeT).
Twenty-five young scientists from all over Switzerland listened to presentations from Prof. Vartan Kurtcuoglu (University of Zurich), who talked about the physics of gases and oxygen distribution in the kidney, and Prof. Roland Wenger (University of Zurich), who focused on the oxygen regulation of EPO production.
Until March 2016, the participants have to study a number of annotated articles on oxygen homeostasis, all of which are available online via the e-learning platform of the Integrative Kidney Physiology and Pathophysiology (IKPP) programme. Tutors will also provide them with questions and exercises that need to be answered and executed. On March 17, 2016, the participants will meet again to present and discuss their work in front of a panel of experts from the NCCR Kidney.CH.

JUNIOR GRANTS 2015

Eilidh Craigie

Alessandro Luciani

Eilidh Craigie and Alessandro Luciani each received one of this year's NCCR Kidney.CH Junior Grants. Both are postdocs — at the institutes of Anatomy and Physiology, respectively — at the University of Zurich (UZH). Eilidh Craigie, from Andrew Hall's lab, studies the regulation of proton pumping in renal intercalated cells, focusing in particular on the role of mitochondria. Alessandro Luciani is a researcher in the lab of Olivier Devuyst, and aims to investigate the role of autophagy and phosphoinositides in regulating endo-membrane trafficking and transport in the proximal tubule.
The Junior Grant award of CHF 60,000 per year for a maximum of three years is intended to help increase candidates' professional independence and to promote their projects.

6TH CALL FOR JUNIOR GRANT PROPOSALS

The 6th call for Junior Grant proposals was launched in October 2015. After a preselection phase, applicants will need to submit their full proposals and have to attend an additional interview in February 2016.

EVENTS

1ST SWISS KIDNEY STONE SYMPOSIUM 2016
February 25, 2016
Inselspital Bern ... save the date!

6TH NCCR KIDNEY.CH RETREAT
February 25–26, 2016
Muntelier Löwenberg, Switzerland

E-LEARNING MODULE 4 FINAL MEETING
March 17, 2016
Bern, Switzerland

53RD ERA-EDTA CONGRESS
May 21–24, 2016
Vienna, Austria ...more

6TH INTERNATIONAL KIDNEY.CH SYMPOSIUM
Renal O_2 sensing & Epo Regulation
June 1, 2016
Zurich, Switzerland

Imprint
Editor: Jens Selige and Inken De Wit
Design: bigfish.ch
Print: SuterKeller Druck AG

KIDNEY CONTROL OF HOMEOSTASIS
SWISS NATIONAL CENTRE OF COMPETENCE IN RESEARCH

University of Zurich[UZH]

FNSNF
Swiss National Science Foundation