Editorial

Dear Biozentrum Alumni,

We are pleased to introduce you, once again, to a Biozentrum alumna: Serej Ley, who spent four years as a scientist in Papua New Guinea and experienced things that most of us only know from books or films. The second interviewee hardly needs introduction as he is known to most of you. Raymond Strittmatter, Head of the Mechanical Workshop, is celebrating his 40-year jubilee at the Biozentrum and casts a backward glance for us. AlumniNews also takes a stroll down memory lane on the occasion of Erich Nigg’s farewell and would like to express its warmest thanks to him for his great dedication and his important contributions to the Biozentrum’s success over the last nine years.

In this issue we not only say farewell but also welcome Alex Schier, the new Director of the Biozentrum and Biozentrum alumnus, and to Camilo Perez, new Assistant Professor of Structural Biology. And last but not least, we present you the “Titan” We wish you enjoyable and interesting reading.

Prof. emeritus Hans-Peter Hauri,  
President of the Biozentrum Alumni Board
For years you have been working on the international stage. Which has been your most exciting project so far?

Serej Ley

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What was the project about?

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I carried out a molecular-epidemiological study to investigate which tuberculosis causing bacterial strains were circulating in Papua New Guinea and what antibiotic resistance they carried. My project comprised a mixture of fieldwork and lab work. This involved examining sputum samples from patients who came for routine check-ups to the hospitals. But we also visited villages to actively look for tuberculosis patients. At that time, I was based at the Papua New Guinea Institute of Medical Research, in Goroka, where I had my own small research team. My supervisor Prof. Hans-Peter Beck was, however, in Switzerland at the Swiss TPH. So, I had to work very independently and organize everything myself.

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And what did you do when you went to the villages?

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Papua New Guinea is a completely different world. What is life like there?

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You can’t compare it to life in Switzerland. While carrying out fieldwork, we lived with the locals in their villages. They live in simple wooden houses and straw covered huts. There is neither electricity nor running water. The people cook over a fire, wash themselves in the river and use a simple pit latrine as a toilet. The whole day they work in their gardens and so provide for themselves. The health centers are equipped with a power generator, but are for many a day’s walk away. To get there, people sometimes have to walk along non-existent roads and through rivers. For some people it is therefore very difficult to get to the centers, especially when they are sick.

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As strangers, how were you received by the villagers?

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As a guest, the village community looks after you. They cooked for us and the people treated us with much consideration and respect. So we were often offered the only chair or the best bed. But Papua New Guinea is a land of contrasts. On the one side, the people are unbelievably friendly and fascinating, but they still continue to have their cruel traditions and rituals.

Alumninews

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For instance, there is still an old belief in sorcery, for which people are even tortured and killed. These contrasts are very strenuous to deal with mentally.

An Were you ever confronted with superstitions?
SL Yes. We also collected blood samples for our study. One day when we entered a village, the locals hid from us. It turned out that they were afraid that we would inject evil spirits into them. Such cultural misunderstandings can make work complicated.

An Did you have any experience, which left a particularly deep impression on you?
SL Despite all the cordiality, Papua New Guinea is, in some parts, a very unsafe country. While I was there, something very sad happened. I still find it difficult to talk about it. At the time, a whole research group from the institute simply disappeared. This included friends and work colleagues of mine. We still don’t know what happened to them but we assume that they were abducted and murdered.

An That was a most shocking experience. What happened to you and how did you deal with it?
SL I was overwhelmed by conflicting emotions. The first impulse was to leave the country, but by no means do you want to leave your friends behind. You want to help but feel so helpless. There is much grief and anger and then you get bombarded with media reports about the incident. It is a weird emotional roller coaster ride. I was panicking about my loved ones but felt bad that I first thought about myself and those close to me. On the other hand, this incident brought us all much closer together. And despite this negative experience, I also experienced many wonderful things in those years.

An Back to your project. Is lab work the same irrespective of where you are?
SL No, there are huge differences. Papua New Guinea is logistically very difficult. For example, it is quite difficult to maintain the cold chain over the great distances. For enzymes it is crucial that they remain continually cooled. The delivery of primers and other lab materials can take up to six months. So you keep checking what and how much you need to order over and over again. I learnt to plan extremely far ahead. I believe that all those, who have ever worked in Papua New Guinea, would agree that you simultaneously have to be a researcher, logistics manager, travel agent, finance consultant and psychologist.

An Did your experiences abroad also change you personally?
SL I learnt much about myself, for instance not to take everything I have for granted.

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An You have worked with various pathogens in diverse countries. Are you tempted by new challenges?
SL For me, variety is quite appealing. I like to read up extensively on a new topic. But the experience gained by working with one pathogen can mostly be applied to other pathogens, too. There are always some parallels and the concepts often remain the same. In my present postdoc position at Stellenbosch University in Cape Town, I am continuing with research on the tuberculosis bacteria, this time however, with a focus on bioinformatics. This field is completely new to me. As a non-computer scientist it is a real challenge. But I love challenges.

An How did it come about that you worked in Papua New Guinea? After all you did your Masters at the Biozentrum.
SL At the time I worked in Prof. Urs Meyer’s lab in Pharmacology. I had the good fortune to work with micro-arrays at the Biozentrum when the Swiss TPH was looking for someone with such experience. And so I started there as a research assistant and worked in the field of drug resistance in malaria parasites. When my partner was then offered a postdoc posi-
The inventor.

For 40 years, Raymond Strittmatter has been enthusiastically seeking solutions for tricky tasks at the Biozentrum. The custom-made products from the Mechanical Workshop range from microscope adapters to treadmills for mice. Yet it is not only for scientists that he gladly does a bit of magic – he did this together with Gottfried Schatz for more than 20 years for school children, to help them appreciate and understand science.

**Alumninews** Did you always have an interest in technology?  
**Raymond Strittmatter** Originally, I intended to become a draftsman, specializing in architecture. But my family wanted me to learn a “decent trade”. Technical things had always interested me. Already as a young boy, I dismantled everything from a tape recorder to a motorcycle. I like to tinker and am most intrigued with problems for which there is no straightforward solution. And this is often the case with all the custom-built items for the scientists. But we manage to solve about 98 out of 100 cases. This is also thanks to the good teamwork with the electronics workshop, the network that I have established with many workshops over the years as examiner, and lots of creativity.

**An** And which was the most fascinating customized product?  
**RS** I can’t really say. It is always the one which I am trying to construct. Once we received the request for a mouse treadmill. I thought this would be a relatively easy job, but it turned out to be pretty tough. The difficulty was to stop the belt from pulling slightly to one side, until a conveyor belt specialist gave me the hint to build in a slight drop of 0.5°. Another job, which I really found fun, was to construct a learning box for mice. With this, the mice learn to reach through a slot in a box to flip a lever on the other side. This starts a water pump that rewards the mice with drops of water. A micropump for such a mechanism costs a fortune. So, together with the electronics workshop, we converted an affordable swimming pool pump to do this job.

**An** How much time does your team spend producing tailor-made products?  
**RS** Prototyping takes up about 40 percent of our time. These items include microscope adaptors, rotators, special shakers, pipette holders, aluminum racks, coating equipment etc. When we still have some capacity, we produce equipment...
that we always need to have in stock, such as electrical milling tools, gel dryers or similar devices, and we occasionally also help other institutes with custom-built articles. For instance, we made dental implant testing tools for the Institute of Dentistry. Our every day work, however, is determined by the repairs required for washing machines, autoclaves, vacuum pumps, incubators, centrifuges – there are total of more than 1000 lab devices – along with the 100 or so -80° freezers. These account for about 40 to 50 percent of our work, are not predictable and usually require urgent attention.

An You took over as Head of the Mechanical Workshop in 1998. What goals did you pursue then and now?

RS With great support from the Human Resources Department and with the approval of Basel's Executive Council – a requirement at that time – I was able to study mechanical engineering part time and take over the management after my predecessor's retirement. However, on one condition: That we work with computer-operated machines in the future. Of course, not everybody was thrilled by this and some thought that I was bringing in some kind of “job killers”. But we have to keep moving with the times to remain competitive. Just recently, a new machine, which enables us to work in 3D, was approved for the new building. This is not to be taken for granted and is a great token of appreciation.

An Looking far back into the past: How was it when you started at the Biozentrum?

RS In those early days, we naturally only worked with conventional machines. PCs were not yet on the horizon. That’s how it came about that in addition to our usual daily tasks, we also occasionally looked after a secretary’s type writer, when a key or the ribbon was stuck. I remember well when the first Mac with its small monitor came in and everybody stood around marveling.

An And how was the atmosphere at the institute?

RS That was basically very familiar. Although the founding fathers belonged to another generation and hence their style of leadership was more patriarchal, they were socially very competent. Of course, since then the Biozentrum has grown but I still find it familiar. It is just no longer a small but rather a large family, in which we support each other. And so, once in a while, after three or four years, a former PhD student or postdoc having come to Basel for a congress, takes the opportunity to drop by. These are special moments.

An Are there other special moments you like to remember?

RS Oh yes, many. But my excursions with Gottfried Schatz were particularly memorable. As an emeritus professor, he began to demonstrate experiments as a magician in kindergartens and primary schools and asked me if I would help him. I became his magician’s apprentice, so to speak. We were underway once or twice a year to different parts of Switzerland. These were incredible days. On the way we discussed about life, the universe and everything, which I found very enriching, and also the children with their spontaneity and enthusiasm were very uplifting. We always came back home very satisfied.

An You have worked at the Biozentrum for 40 years. Your retirement must be approaching. What are your plans?

RS Well actually, retirement is not yet around the corner. I have submitted a request for a work extension to 67 years, that is until 2021, because I enjoy working, my wife is still employed, too, and my son still studying. What is also very important to me is that I want to be around for the move into the new Biozentrum building and set up the workshop there. This will be demanding but also very exciting, as we have been involved for so long and also made some contributions. And, of course, I will not be idle even when I’m retired. My son has taken the road to architecture and I have again realized how much this still interests me. That’s why I have joined a course on “drawing objects” at the Basel School of Design. My plan is to then continue with a course on architectural drawing. It just feels good to be involved in something completely different and to look at things with other eyes. [1]

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It came out of the blue, the offer from the Biozentrum. Erich Nigg had just bought a house close to Munich. This was where he wanted to settle down. But things turned out differently. Erich Nigg became the first Director of the Biozentrum. Now this era is drawing to a close. Alumninews takes a stroll down memory lane.

It is the end of the 60s. A documentary film shows men dressed in white coats trying to find a way of producing “ham” from petroleum, in order to help fight world hunger by manufacturing synthetic foods. They called themselves biochemists and they impressed the high school graduate Erich Nigg, who at the time also felt the desire to help combat hunger. This idea still followed him at the beginning of his doctorate at the ETH in Zurich with Giorgio Semenza. But then he joined the biophysicist R. J. Cherry. He was an Englishman and Erich Nigg, who’s English was limited to Bob Dylan songs, found that it was now high time to improve his abilities.

The change was not difficult. It was in his nature to always look for new challenges. “I was never one of those scientists who, since childhood, knew exactly to which questions they were seeking an answer. There are simply so many different things that interest me,” explains Erich Nigg. Nevertheless, the original quest did not disappear; his striving to help and discover new knowledge. “I was involved in my research with 150 percent passion. I just needed to find things out. In retrospect, I think that the intensity of my emotions, whether joy or frustration, was the greatest when I still carried out experiments in the lab myself. Over the years, the aspiration to go beyond making my own discoveries and to contribute to a greater whole has grown stronger,” says Erich Nigg.

After having worked in many places – the Nigg family relocated ten times, from Zurich to California and back again, then to Lausanne and Munich – Erich Nigg moved to the Biozentrum to become its Director in 2009. “The proposition of taking on the directorship was both an honor and a challenge. Since my early days as a scientist, the Biozentrum was for me a beacon and Switzerland’s finest institute for molecular and cell biology. A spirit of optimism prevailed in Basel. During my research career, I had often questioned decisions on science policies, and so I wanted to seize this opportunity to take on responsibility,” relates Erich Nigg. With Erich Nigg, the Biozentrum also broke new ground and, in terms of management, implemented the change from a rotation system to that of having a devoted Director. This had the advantage of making longer term planning easier and bringing the management function into the spotlight. “It was clear to me since 2009, Erich Nigg has been the Director of the Biozentrum and Professor of Cell Biology. With his team, he investigated the segregation and distribution of human chromosomes during cell division. Erich Nigg studied biochemistry and microbiology at the ETH in Zurich, where he obtained his doctorate in 1980. He then worked as a postdoctoral fellow at the University of California in San Diego. In 1982, he returned to the ETH Zurich and in 1987 became a research group leader at the Swiss Institute for Experimental Cancer Research (ISREC). Subsequently, he became a Professor of Molecular Biology at the University of Geneva, followed by an appointment to Director at the Max Planck Institute of Biochemistry in Martinsried, Germany, in 1999.
that, as Director, I had to throw a switch and reduce my own research for the benefit of the Biozentrum, in order to be able to meet the many tasks," says Erich Nigg.

And this was important. At that time, many people argued that the Biozentrum was in a crisis, although Erich Nigg considered this verdict to be not entirely justified. He argues that younger scientists had followed in the footsteps of the Biozentrum’s founding fathers, many of them eminent scientists recruited from around the globe, and that this next generation simply needed more time to establish an international reputation. Nevertheless, it was one of Erich Nigg’s primary concerns to alter this perception, to establish new standards of quality and to help the Biozentrum regain its high standing. And this he accomplished. “During the last years, we have been able to recruit very good scientists. Especially among the youngest there are some great talents,” concludes Erich Nigg.

Among Erich Nigg’s most important contributions are the new Core Facilities. By offering highly specialized expertise, these platforms provide the scientists with access to leading edge technologies. Moreover, they are efficient and economical, they stimulate scientific exchange among the researchers, and they help to establish common priorities – or, to put it in a nutshell, they promote a collaborative spirit. This is a matter of great importance to Erich Nigg. Not only in research, but also in the non-scientific foundations of the institute – the Workshops, Floor Managers, Facility Management, the Administration etc. – he always tried to promote a sense of identity, of belonging and “we-ness”.

And even with all these responsibilities, along with the daily business typical for a renowned scientist, Erich Nigg’s own research did not suffer excessively. “In comparison to earlier times, I kept my group relatively small. Having reduced resources and fewer people actually had the advantage that my lab had to be more focused. As a research group leader, I saw my role primarily as a “guardrail” to ensure that our research moved ahead on a productive path. Apart from that, I have always tried to give young scientists ample freedom, and the time and room required for creative research.”

In his research, he has been supported for 40 years by his wife Elena Nigg. Initially trained as a nurse, Elena retrained as a lab technician after raising their children. “I still remember how I explained the properties of DNA, RNA and proteins to Elena during walks in the forest. Over the years, she has become my most experienced lab technician and lab manager,” says Erich Nigg with a smile. But Elena Nigg is not the only family member in Erich Nigg’s team. Shortly before moving to the Biozentrum he fulfilled his childhood dream of having a dog, and so the Australian Shepherd “Vasco” moved into the Director’s Office, where he greets guests with a friendly welcome. So, at the end of January, 2018, not only Erich Nigg will reach emeritus status, but Elena and Vasco will also go into retirement. Erich and Elena are particularly looking forward to having more time for their grandchildren. In addition, in his own atelier in the winter garden of his house, Erich will soon be able to exchange his former lab coat for an artist’s smock and devote himself to his new passion, painting.

The “Erich Nigg Farewell Symposium” will take place on February 1st, 2018. > more

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Alex Schier appointed new Director

The Biozentrum is delighted to welcome the Biozentrum alumnus Prof. Alex Schier as its new Director. He will start on February 1, 2018.

Born in 1964 in Basel, Alex Schier studied cell biology at the Biozentrum, where he earned his doctorate in 1992 under Prof. Walter Gehring. As a postdoc, he conducted research at the Massachusetts General Hospital and Harvard University, USA. In 1996, he was recruited as Assistant Professor to the Developmental Genetics Program in the Skirball Institute and the Department for Cell Biology of the New York University School of Medicine. He returned as Professor to Harvard University in 2005, where he headed the Department for Molecular and Cell Biology from 2014 until 2017. “It is exciting to come back to Basel and apply the lessons I learned in Switzerland and America to help catalyze the Life Sciences in Basel,” says Alex Schier. “Erich Nigg has strengthened the Biozentrum’s reputation as a world-class institute and recruited outstanding scientists to Basel. As the new Director, I look forward to writing the next chapter in the Biozentrum’s history together with my colleagues.”

Alex Schier is internationally renowned for his pioneering research on the development of vertebrates, using zebrafish as a model organism. He has received several academic awards, among them the Merit Award and the Pioneer Award from the National Institutes of Health.

Alumninews will present a detailed portrait of Alex Schier in its spring edition.
One morning, only a few weeks ago, the Nobel Committee in Stockholm once again reached for the phone to inform this year’s prize winners about their luck. This is also how they surprised the Biozentrum’s alumnus Prof. Jacques Dubochet. Along with two other scientists, he was awarded the Nobel Prize for Chemistry 2017 for the development of cryo-electron microscopy. The professor emeritus, who was last involved in research and teaching at the University of Lausanne, also worked at the Biozentrum from 1971 to 1978. In 1974, Dubochet graduated with his doctorate from the group of Eduard Kellenberger, who was one of the Biozentrum’s founding professors.

“To the very last, the two had a very close friendship,” recalls Henning Stahlberg, who himself was once a PhD student of Dubochet in Lausanne and is now Professor of Structural Biology at the Biozentrum. “I was of course very excited to hear that, with Jacques, a former researcher of the Biozentrum has been honored with the Nobel Prize. In the electron microscopy community, we all anticipated that these three pioneers would one day receive a Nobel Prize.” The time spent in Jacques Dubochet’s lab has influenced Henning Stahlberg deeply. He followed in the footsteps of his supervisor and continues to work in the field of electron microscopy. And so the researchers have stayed in contact over the years, regularly exchanging the latest ideas. “Jacques still comes to Basel about every three months. He passes by, dropping in to see what we are up to and to hear what is happening in this field of science,” says Henning Stahlberg.

This prize winning method is also regularly in use at the Center for Cellular Imaging and Nano Analytics (C-CINA), headed by Henning Stahlberg. In the heart of C-CINA, beside many other electron microscopes, stands the “Titan”. The name says it all. At a height of 4.5 meters, this electron microscope is a giant among its kind at C-CINA. But despite being seemingly robust, the “Titan” is astonishingly sensitive. So it is hardly surprising that one must descend into a shielded, low-vibration cellar in order to catch a glimpse of this colossus. But thanks to its sensitivity and extremely high resolution, the electron microscope produces needle-sharp images of biomolecules, in which even individual atoms can be detected. The development of so-called cryo-electron microscopy triggered a revolution. This technique made it possible to capture snapshots of molecules in action. To obtain such snapshots, the samples must be cooled down to below -180° C in a split second. Shock freezing prevents the formation of destructive ice crystals, because the water hardens into a solid, glassy state. Such deep-frozen biological molecules can be completely preserved in the vacuum of the electron microscope. This freezing is almost as if time would stand still for the molecules. The rapid advances in image recording and data processing have led to high-speed cameras in the electron microscope that can record every single electron by taking 400 shots per second and thus produce sharper images than ever before. This allows images being taken in an automated manner, and pieced together to uncover 3D structures. These images give an impressive insight into how the molecules of life are constructed and how they work. This relatively new technology makes previously hidden processes within the cells visible and opens the door to a hitherto unknown nanocosmos.

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Alumninews Where do you come from? 
Camilo Perez I was born in Bogota, the capital city of Colombia, where I grew up together with my parents and two siblings. My mother comes from the coastal area of Colombia and my father from Bogota, which is interesting because Colombia is a very diverse country. So, one can say that I grew up with a funny mixture of two different cultures.

An In your research you investigate membrane proteins. How did you end up in this field? 
CP I carried out my Diploma thesis in biochemistry in the lab of the biophysicist Luis Osses. This choice determined much of my career. He offered a project to investigate ion channels in the membrane of *Plasmodium falciparum*, the parasite that causes Malaria. The project sounded very interesting to me, but to be honest, I had no idea how challenging it would turn out to be.

An In 2008, you moved to Germany to start your PhD at the Max Planck Institute for Biophysics in Frankfurt. Did you experience culture shock? 
CP Yes and no. I had been to Europe twice before, for internships in Göttingen and Paris during my Master studies. But the first time I came to Europe was really a shock – in a positive way: I was astonished about the well-organized public transport system. I could really appreciate it, as in Bogota it is so chaotic.

An Why did you decide to do your PhD in Europe? 
CP During my internships I got to know about the International Max Planck Research School fellowships from the Max Planck Society in Germany. And then I found a PhD program on membrane proteins at the Max Planck Institute for Biophysics in Frankfurt and felt this was a 100 percent match. I sent my application and got the IMPRS position. Later, they told me that I was the first candidate from Colombia that they had ever invited for an interview.

An How does research in Colombia differ from research in Europe? 
CP I have to admit this part was the real culture shock. The research level here in Europe is much higher due to the support that institutions receive from the government. In Colombia you have to pay to do your PhD. In Europe, you get your salary. However, research in Colombia is also totally different in terms of ordering material. Sometimes it can take half a year to get something.

An You started at the Biozentrum less than half a year ago. And it looks like your lab is already running. So, you obviously also planned ahead? 
CP Yes, absolutely. When I found out that I will be a SNSF professor in Basel, 

Planning ahead makes research easier.
I immediately started planning how to install my lab. I started ordering equipment and in April and May I already held interviews with several candidates. One week after starting they did their first experiments...

**An** Why did you decide to come to the Biozentrum?

**CP** I had always wanted to become a PI. The professorship program of the SNSF is ideal for this but you first have to find a host institution. And additionally, you also have to show that you are mobile and do not stick to one institution. So, after carefully looking many institutions in Switzerland, I notice the outstanding research and facilities at the Biozentrum and decided to apply.

**An** You did your postdoc at the ETH Zurich in the lab of Kaspar Locher, who collaborates with Henning Stahlberg. So, did you already get to know Henning then?

**CP** Not really. In Kaspar's lab, I worked on a membrane transport protein of the flipase type and wanted to solve its structure. We had two different possible approaches to this. Either with crystallography or with cryo-electron microscopy. So, we decided to contact Henning to help us with cryo-EM.

**An** So, Henning helped you to solve the structure?

**CP** No, the funny part is that in the end we were very successful with crystallography and did not need Henning's help anymore. But in the future with my own projects, I will contact him again. So, hopefully our collaboration was just postponed.

**An** What are your research plans for the next years?

**CP** Well, I will definitely keep on working with membrane proteins since there are so many essential pathways in cells that depend on the activity of this type of proteins. What I am interested in are membrane proteins which are involved in the cell wall biogenesis in pathogens. It would be great to keep uncovering answers to the questions about antibiotic resistance. A problem this big will only be solved by a combination of efforts of experts from different fields. At the Biozentrum, there are many other researchers working in the fields of infection biology and structural biology. That opens a lot of opportunities for collaborations.

**An** You have a twelve years old daughter. So, you must have been quite young when you became a father?

**CP** Yes, I met my wife, who is also a scientist, during our studies at the National University of Colombia. At first, the situation was quite a shock for us. I was 24 and had not even finished my diploma studies when I became a father. It was quite complicated for us to manage everything, as neither of us wanted to give up our dream of becoming a research scientist. When I left Colombia to go to Germany for my PhD, my wife and my daughter followed me half a year later. My wife found a PhD position at the Goethe University in Frankfurt. So, in the end we both managed to continue our careers.

**An** What do you miss the most from your native country?

**CP** I still miss the coffee from Colombia, of course. It tastes so different. The coffee in Switzerland is much too strong. I always have to mix it with water, otherwise I could not drink it.

**An** Your wife is working at the ETH in Zurich. Do you plan to move to Basel?

**CP** That is something we are discussing. For the moment, I think we both feel comfortable with the current situation. While I commute between both cities, I use the time in the train for reading and planning. So, as I appreciate the transport system in Europe, now seems to be the time to use it more often…

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Michael Hall receives Lasker Award.

The Lasker Basic Medical Research Award 2017 goes to Prof. Michael Hall. It is one of the most distinguished research awards in biomedicine worldwide. The American Albert and Mary Lasker Foundation hereby honors Michael Hall for his fundamental discoveries in cell growth that have opened up a new field of biomedical science. With his discovery of the protein TOR, the biochemist was able to identify a key element in the regulation of cell growth. By activation and inactivation of different signaling pathways, it controls cell growth and size. Uncontrolled cell growth plays a major role in the development of a number of diseases. Dysregulation of the intricate TOR signaling network is involved in the development of cancer, diabetes, cardiovascular diseases, and in aging processes. The work of Michael Hall has led to a fundamental change in how one thinks about cell growth and has provided critical knowledge for the development of anti-cancer drugs. Michael Hall is the sole recipient of this year’s Lasker Award for Basic Medical Research.

Anatole Abragam Prize for Prof. Björn Burmann.

Björn Burmann, until recently a postdoc in Prof. Sebastian Hiller’s group, has received the Anatole Abragam Prize of the International Society of Magnetic Resonance (ISMAR). With the prize, ISMAR recognizes Björn Burmann’s pioneering contributions to the determination of structure and dynamics of chaperone-protein complexes at atomic resolution using high-resolution NMR spectroscopy. The Abragam prize is one of the most distinguished awards for young scientists in the field of NMR spectroscopy.

Bacteria have a sense of touch.

Prof. Urs Jenal

All inner and outer surfaces of our body are potential entry gates for pathogens. The first few seconds – the moment of touch – are often critical for successful infections. Some pathogens switch on their virulence in response to mechanical stimuli and acquire the ability to attach to the host tissue. The research group led by Prof. Urs Jenal has recently discovered that Caulobacter bacteria use the flagellar motor as a mechanosensitive device to sense and rapidly attach to surfaces. This mechanism is also used by pathogens to colonize and attack host tissue.
High-speed locomotion neurons found in the brainstem.  
Prof. Silvia Arber

When we run to catch a bus, the flawless cooperation of muscles to gain high speed is stunning. To execute locomotion at high speeds, a clearly defined subpopulation of neurons in the brainstem is essential. These high-speed neurons are intermingled with others that can elicit immediate stopping. How defined groups of brainstem neurons can regulate important aspects of full motor programs, reports a study by Prof. Silvia Arber. These findings provide an important step forward for a better understanding of the neuronal underpinnings at work in the brainstem during the control of movement.  > more

Bacterial nanosized speargun works like a power drill.  
Prof. Marek Basler

Millions of tiny microbes on leaves, stones or our skin jostle for space. In order to get rid of unpleasant competitors, some bacteria use a nanosized speargun. The team of Prof. Marek Basler has now gained new insights into the construction, mode of action and recycling of this weapon, the so-called type VI secretion system (T6SS). By comparing the structures of the contracted and newly resolved extended state, the researchers were able to model how the T6SS works in detail. Within less than two milliseconds, the T6SS sheath contracts to half of its length and at the same time the toxic spear spirals out like a screw.  > more

A protein that extends life of yeast cells.  Prof. Mihaela Zavolan

For about one hundred years it has been known that nutrient restriction and moderate stress can significantly prolong life. The researchers led by Prof. Mihaela Zavolan and Prof. Anne Spang have now discovered that the transcription factor Gcn4 decreases protein synthesis and extends the life of yeast cells. The transcriptional suppression of genes that are important for cellular protein synthesis by Gcn4 seems to account for its lifespan extension effect. Gcn4 is conserved in over 50 different organisms, including mammals, and it likely play a significant role in the aging of these organisms as well.  > more

RNA molecules live short lives.  Prof. Attila Becskei

RNA molecules transfer the genetic information of DNA and provide a template for the production of proteins that regulate all the cell's processes. Prof. Attila Becskei's group has developed a new method to measure the half-life of RNA molecules. The study revealed that commonly used methods provide distorted results and that RNA molecules live an average of only two minutes, ten times shorter than previously assumed.  > more