

Allocution of Professor Mirjam Christ-Crain

Laureate of the National Latsis Prize 2009

on the occasion of the Prize Ceremony
Thursday, 14th January 2010
Rathaus, Berne

It is a great honor and a great joy for me to receive this phantastic distinction, which is the National Latsis Award. I warmly thank the Latsis Foundation and the Swiss National Science Foundation for choosing me for this prestigious Award. This Award is an enormous motivation for me to follow my research projects and to invest my future time and energy into research.

Of course, it is not only me, who deserves this great appreciation, but it is my whole research team. And in a certain way I would almost say that I receive this Award as a representative for all researchers of my generation who daily contribute to a progress in medicine with great enthusiasm and persistency. To receive such an Award is not only a great honor, but also a responsibility. I am well aware of this meaning of the Award. Strictly speaking is this prize not only an Award for already achieved merits but also expression of great expectations. I definitely feel a certain pressure. Ladies and gentlemen, I can assure you that I will do everything to satisfy these high expectations at least to a certain degree.

Endocrinology is the science of hormones. And what makes hormones so fascinating is that they are everywhere in our body and everything that happens in our organism is somehow related to hormones. That's why we are trying to extend endocrine research into all different fields of diseases. In other words, my understanding of endocrinology doesn't end with the so called classical endocrine diseases; it goes clearly beyond that: I look at all sort of important and very common diseases like pneumonia or others from an endocrine point of view. I am convinced that hormones as biomarkers can tell us a lot about all these diseases. I might call this field of research the topic of "extended endocrinology".

To make this more clear to you, I would like to tell to you now a little bit of my career and try to explain the most important results of my work:

As a clinical endocrinologist, I started doing clinical research at the University Hospital Basel in 2001, in the research group of my mentor Professor Beat Mueller. The idea

there was: to use hormones as biomarkers to make a better diagnosis and a better therapy for all sort of diseases.

First, we explored the hormone procalcitonin. This hormone is increased in blood when a bacterial infection is present. In contrast, in a viral infection, procalcitonin is low. These characteristics of procalcitonin are therefore a unique opportunity to differentiate bacterial from viral infections. This was so far not possible with routinely used laboratory tests or with a clinical examination. Why is this so important? The differentiation between bacterial and viral infections has great clinical implications, when it comes to the use of antibiotics: Until now the problem was that too many antibiotics were used when they were not needed. And this high rate of antibiotic prescription leads to a dangerous increase in antibiotic resistance rate. And here comes the important thing: the hormone Procalcitonin can tell you whether an infection is viral or bacterial and therefore whether you should use antibiotics or whether you better don't use them. In other words: the hormone procalcitonin improves diagnosis in medicine by differentiating viral from bacterial infections.

We verified this concept in 5 randomized controlled clinical trials including more than 2'500 patients in different hospitals in Switzerland. In our studies, we were able to show that procalcitonin guidance reduced antibiotic prescription and duration by 50%. This reduction will have a great positive impact on the worldwide increasing antibiotic resistance rates.

2005, I went to London, to St. Bartholomews hospital, where I worked in the group of Prof. Ashley Grossman. In London, I focused on a different biomarker, the famous stress hormone cortisol. First, I tried to understand the molecular mechanisms of this hormone. And then, I started a project investigating the question whether cortisol can help us to predict the outcome in different diseases. Again, I focused my research on pneumonia. I developed a new assay to measure the free form of the stress hormone cortisol. I found that this stress hormone mirrors the severity of pneumonia better than previously used prognostic blood markers and clinical examination. When a patient comes to the hospital and has a high level of cortisol, he has a much higher risk to die from pneumonia than a patient with a low cortisol level. In this case, the biomarker cortisol tells us how severe an infection is.

Back in Switzerland, in 2007, I started to build my own research group, continuing with stress hormone research. Together with one of my research fellows, Dr. Mira Katan, who is by the way a great researcher and a great doctor, we found that copeptin, another hormone, which is directly produced in the brain, can predict the outcome in patients with stroke. If a patient comes to the hospital with a high level of copeptin, he has a high risk to die or to remain handicapped. On the other hand,

when a patient comes with a low level of copeptin, we could observe that he has a very good chance to recover within a few months from his stroke.

2009 I received a research professorship of the Swiss National Science Foundation. This professorship gave me and still gives me the unique chance to build up a bigger research group and to plan further longterm multicenter clinical trials. My ongoing and future projects focus on different aspects of stress hormones. We now investigate whether treatment with stress hormones, with corticosteroids, can help to more rapidly cure patients with pneumonia. Furthermore, using these biomarkers we plan to improve hospitalization by making it better and shorter. Last but not least, this will help to optimize the allocation of the limited health care resources.

All these projects would not have been possible without a stimulating and supporting research environment. Above all, I want to thank my mentor, Professor Beat Müller, now head of Medicine in Kantonsspital Aarau. He was and is a pioneer in clinical research with innovative and courageous ideas. He always supported me without hesitation and gave me great motivation and encouragement when it was needed. Like nobody else, Beat Müller is a living example of a researcher with enthusiasm: he has got the famous “feu sacré” and he has given it to me. Beat, I thank you so much for all that. He also taught me the importance of mentoring. A good mentor is a generous and altruistic person. I hope that I can once do for my mentees what he did for me. The mentor behind my mentor was Professor André Perruchoud. He supported and helped me in many crucial moments in a generous and warmhearted way. Thank you very much. Furthermore, I want to thank Prof. Jürg Schifferli, who gave me support with my research professorship. I also want to thank my mentees, without them and their commitment and loyalty, all current research projects would not be possible. I was always lucky to find very motivated, young and talented people who are as enthusiastic about research as I am. And then once again, I want to thank the Latsis Foundation and the Swiss National Science Foundation for giving me this important Award and, thus, for believing in me and my projects. And last but not least, I want to thank my family, my husband, my two children, my parents and parents in law. Without them, it would not be possible for me to combine research with a happy family life.