



# We were all PhD students...

TWELVE PERSONAL STORIES



200  
1810 – 2010 *Years*



**Karolinska  
Institutet**



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# Preface

What is doctoral education? What is it like to present a thesis and defend it at a public disputation? What is special about doctoral education at Karolinska Institutet? These are some of the questions that the Board of Doctoral Education attempts to answer in this brochure.

Karolinska Institutet is celebrating its bicentenary in 2010. Today we educate more students than any other medical faculty in Sweden. Approximately one third of the students at Karolinska Institutet are PhD students, and this is therefore a major part of the daily activity at Karolinska Institutet. Doctoral education has undergone many changes during the 200-year history of Karolinska Institutet, not only due to the shifting nature of research in itself, but also as a consequence of changes in how doctoral education is viewed and ideas about how it should be organised. No matter how this development is viewed, doctoral education at Karolinska Institutet remains a very attractive option in 2010, and competition for admission is fierce. And this is something we are proud of.

The portraits that follow present 12 people who have completed their doctoral degrees at Karolinska Institutet at various periods. They have been given the opportunity to describe their time as a PhD student and the impact it has had on their professional life. What did they learn? What was important? What do they remember most vividly from that period? How did their lives then continue, and what was the significance of their doctoral education at Karolinska Institutet?

Some themes emerge repeatedly. Many point out how important their supervisors have been, and the creative environment that the supervisors encouraged. How important it was to be respected, to be stimulated, to leave behind the role of student and start doing real research.

To become a worthy participant in a dialogue that never ends and in which there are always unanswered questions. To be able to experience an international environment in which boundaries disappear when confronting the common task of development and examining new ideas together. To be involved in developing new methods of treatment and new drugs in order to be able to offer improved care to patients. Learning how to evaluate arguments critically, to handle large quantities of information and complex issues, learning an approach to developing and ensuring the progression of the work. These and many other themes can be found in the portraits that follow.

These presentations also make it clear that doctoral education is a profoundly personal experience – something that imprints itself onto the student and often has a fundamental significance in his or her career. And each presentation is unique! You will meet 12 former PhD students – six men and six women – from Karolinska Institutet on the pages that follow. All of them have made amazing contributions in very different fields. Read these portraits and allow yourself to be impressed and inspired!

**CLARA HELLNER GUMPERT**  
*Dean of Doctoral Education*





# Katarina Bjelke

The pathway from research student to director-general has been pretty much direct. Katarina Bjelke has been head of the Division for Research Policy at the Ministry of Education and Research for a couple of years now.

**Katarina Bjelke** was born in 1965 and took her doctorate in 1997 with a thesis concerning peripheral nerve damage. She became a licensed dentist in 1991. Katarina Bjelke has broad experience in the administration of research and research finance. She was appointed head of the Department of Research and Doctoral Education at Karolinska Institutet in 2003. She has been director-general at the Ministry of Education and Research since 2008, with responsibility for research policy. Katarina Bjelke is chair of the auditors of the Nobel Foundation. In her youth she competed in alpine downhill racing, but now tends to take things easier on the slopes.

**KATARINA BJELKE TRAINED AS A DENTIST** and has worked both in the clinic and in research. She became interested in research early on in her studies. The teachers at the Department of Anatomy were committed and they had the ability to create a healthy and stimulating atmosphere. Further, Katarina found the nervous system fascinating, and became involved in several projects. It wasn't long before she was on the teaching staff of the department, giving lectures herself.

“One of the fields we studied was nerve cells in the spinal cord and brain, and the changes that arise following peripheral damage in the facial region. This then became the subject of my doctoral thesis,” says Katarina.

The period at the Department of Anatomy was extremely positive. It was home to a group of research students who helped and supported each other, and it was characterised by an open and friendly atmosphere. Everyone had daily contact with their supervisor. It was good soil in which to grow. The group was also involved in extensive international collaboration, and travelled to conferences, got

to experience other research labs, and received guest researchers.

“I realised early on how international research had become, and this has certainly contributed to my ever-present interest in international issues.”

When Katarina took her doctorate, she had already worked for some years as a dentist. Karolinska Institutet was looking for someone to work with research funding in the Grants Office, and she jumped at the chance. She felt that she wanted to do something completely different from her previous work. She now gained great benefit from her experiences as a research student, having seen the world of research from the inside and understanding what it was like to apply for research funds. She also worked with issues of research policy and research education, seeking new international collaboration within various fields with strategic significance for Karolinska Institutet. She was involved in drawing up comprehensive research agreements with several universities in various parts of the world.

A few years later, Katarina became head of the Department of Research

“I realised early on how international research had become, and this has certainly contributed to my ever-present interest in international issues.”

and Doctoral Education at Karolinska Institutet.

“I thought it was the best job in the world. It was a mixture of many topics: recruitment, finance, ethics, international issues, etc. The dynamism of the office was marvellous.”

A background in research and administrative experience in research and research education have been highly significant in Katarina’s career. A post as director-general at the Ministry of Education and Research was announced in 2008, and Katarina applied and was awarded the position.

“I like working with the big picture. One of our tasks is to coordinate the government’s research policy. We are now working with knowledge transfer, such that we can ensure that research results become practical improvements. Another important issue is that of scientist mobility – and the obstacles that prevent it – between the academic world, the business world and official bodies. This also involves mobility between countries. The goal is, naturally, that the knowledge that research creates is to benefit citizens in the form of better health, innovation and growth.”



# Ewa Björling

Research, clinical practice, politics. Ewa Björling has a wide repertoire. She was appointed Minister for Trade at the Ministry for Foreign Affairs in 2007. Her period as a researcher has been an important step along the way.

**Ewa Björling** was born in 1961 and took her doctorate in 1993 with a thesis dealing with B-cell immunity against HIV. She is a dentist, a qualified dental surgeon, and was appointed associate professor of virology in 1999. Ewa Björling led a research group at Karolinska Institutet for several years. She has been a member of the board at the Swedish International Development Cooperation Agency and chair of the National Council for Coordination of HIV Prevention. She was elected an MP for the Moderate Party in 2002, and appointed Minister for Trade in 2007. Ewa Björling likes speed – she drives a Porsche 911.

**WHEN THE MODERATE PARTY'S EWA BJÖRLING** was appointed as Minister for Trade, she had been a member of the Parliamentary Committee on Foreign Affairs for five years, where her areas of expertise had included trade issues. She had also been active in the issues of international development and human rights. She wanted to develop cooperation with all countries, not least the countries of Africa, where one of the objectives was to prevent the spread of HIV/AIDS.

During her time at the Department of Microbiology, Tumor and Cell Biology at Karolinska Institutet, Ewa gained experience from international work, and from meeting and understanding other cultures.

“The atmosphere was very international. There was a steady stream of visiting scientists from all parts of the world, we participated in scientist exchange schemes, and we organised seminars with external speakers. I have benefited enormously from all of this experience in my work at the ministry.”

Ewa Björling's pathway to research into HIV and her appointment as associate professor of virology was

not straightforward. She is a dentist, a registered dental surgeon, but research came to play an evermore important role. This is not surprising – she has “always been a curious person”. As a child, she wanted to become a vet, but was open to the idea of a future as a physician or dentist, preferably in combination with research. It was the idea of carrying out practical work while at the same time facing intellectual challenges and facing new problems that appealed to Ewa. This led to her taking courses in both medicine and psychology during her training as a dentist, and starting in research. Her first interest was a type of paramyxovirus, but after being accepted as a research student she concentrated instead on HIV. Her supervisors were Erling Norrby and Francesca Chiodi: “two very different personalities who complemented each other well”.

Ewa spent time at Scripps in California, both as a research student and afterwards. One of the techniques she learnt there was a new method of producing synthetic monoclonal antibodies. She brought the method home to Sweden and established it



“There was an open atmosphere at Karolinska Institutet, you were allowed to think unconventional thoughts: it was a very stimulating place to be. I have left a piece of my heart there.”

here. It was initially used for HIV, and later for other types of virus. It is now used at many labs and has contributed to the development of new antiviral agents.

Ewa started to get involved in local politics towards the end of the 1990s, and was elected an MP in 2002.

“It was hectic. It was difficult to find time for work as a dental surgeon, I had my own research students at the time and sometimes we had to hold lab group meetings in my office at the parliament!”

Ewa has always felt a pull towards the world of research, but now she has left this world behind her, at least for the present. “Minister for Trade is a fantastically interesting job,” she says, and her previous experience has given her many benefits. With a background in research she can rapidly deal with large quantities of information in a short period, and she is open to new ideas.

“There was an open atmosphere at Karolinska Institutet, you were allowed to think unconventional thoughts: it was a very stimulating place to be. I have left a piece of my heart there.”



# Jonas Friséén

Clinical work or continued research – not an easy choice. But he realised that he would find it difficult to stay away from the lab, and so he chose research. Today, Jonas Friséén is internationally recognised for his work in stem cell research.

**Jonas Friséén** was born in 1966 and took his doctorate in 1993 with a thesis dealing with damage to the nervous system. He became a licensed physician two years later. Jonas Friséén was appointed professor of stem cell research at Karolinska Institutet in 2001. He is a member of, among other bodies, the Nobel Assembly at Karolinska Institutet, and has been awarded several prestigious international prizes for his research. He is founder of the pharmaceutical company Neuronova. His leisure time revolves around his family, reading fiction, and wind surfing in the summer.

**WHEN JONAS FRISÉÉN STARTED STUDYING MEDICINE**, he was intending to become a doctor. He took a course in neuroanatomy and became fascinated by how the nervous system works. He envisaged a future within neurology, possibly as a neurosurgeon or a psychiatrist. One of the teachers, Kaj Fried, who was working on damage to the peripheral nervous system, welcomed Jonas into his lab. Kaj Fried later became Jonas' principal supervisor, together with a colleague in the lab next door, Mårten Risling, who was working on the central nervous system.

Thus, Jonas studied medicine during the day, and worked evenings and weekends in the lab. During the final two years before taking his doctorate, however, he worked exclusively in research.

"I was probably overambitious at the time, but it was just so much fun! Being creative, working on my own initiative, producing ideas and finding ways to solve problems and make progress – all of this was so tempting. There's no map showing where research will lead, and that's

what makes it so challenging. I met my supervisors pretty much every day, and they gave me considerable leeway to work independently."

There were, of course, some courses taught for research students but these were not compulsory, and Jonas chose not to take them. But he did take part in one course, and this was to be of major significance. It was an international summer course, held on the island of Elba, and it dealt with the reaction to damage in the nervous system. It resulted in one of the teachers inviting Jonas to a research lab in Munich, where he spent the whole of that autumn. A totally new technology was being used at the lab, one that allowed a broader approach to the problem. Back in Sweden, Jonas started collaboration with other research groups at Karolinska Institutet, and this paved the way for using more advanced methods in investigating the nervous system.

Jonas made several important discoveries during his time as a research student and the subsequent years, including the discovery that the adult human brain contains certain im-

“There’s no map showing where research will lead, and that’s what makes it so challenging.”

mature cells. He characterised these cells and showed that they were stem cells, which can develop to become different types of nerve cell. He also mapped their locations in the brain. The results were published in 1999, including publications in the journal *Cell*.

Stem cell research has progressed rapidly during the past ten years.

“Progress has been much faster than I imagined. The cells known as ‘iPS stem cells’ are most interesting today: these were discovered a couple of years ago by a Japanese research group. They discovered that it is possible to reverse normal skin cells such that they revert to the stem cell stage, and from there can be directed to become completely different types of cells.”

Jonas’ research has, among other things, led to two new drug candidates: one for the treatment of Parkinson disease, the other to slow the progress of disease in ALS. These are now being studied in Phase I clinical trials. The substances have been developed by the pharmaceutical company Neuronova, founded by Jonas.



# Jan-Åke Gustafsson

He has always been happiest when the pace is high, even when he was a research student. It took Jan-Åke Gustafsson less than two years to complete his thesis. And three years later he had qualified as a physician.

**Jan-Åke Gustafsson** was born in 1943 and took his doctorate in 1968 with a thesis that dealt with the major role played by the gastrointestinal flora in the metabolism of steroid hormones. He qualified as a physician in 1971. Appointed professor of chemistry in 1976 and professor of medical nutrition in 1979. He built up the Novum research park in Huddinge, and founded the KaroBio company in 1987. He has been awarded several major prizes and is a member of several scientific academies, including the Swedish Academy of Sciences, the Swedish Academy of Engineering Sciences and the American National Academy of Sciences. Jan-Åke Gustafsson was appointed head of the Center for Nuclear Receptors and Cell Signaling in Houston, Texas, in 2009.

**JAN-ÅKE GUSTAFSSON'S TEENAGE PLANS DID NOT INCLUDE STUDYING MEDICINE** and becoming a doctor. He wanted to be a priest. But learning Latin didn't appeal to him, so he believed that he could make his contribution to humanity as a cancer surgeon instead.

Jan-Åke came into contact with several colourful personalities while studying chemistry at the old Chemistry lab. One of these was Sune Bergström, later to become Nobel laureate in medicine: "an enormous talent and driving force". Bengt Gustafsson, carrying out research into medical symbiosis, was another who would have great significance.

Bengt Gustafsson had built up activities in the field of gnotobiology, which is the study of bacteria-free animals. One aspect of the work involved determining the microflora in the gastrointestinal tract and determining its significance in cancer, and in the absorption of nutrients and other processes. Jan-Åke was to characterise and compare different products of hormone metabolism, metabolites, in bacteria-free and normal rats. He found major differences

between the animals, and between male and female rats. Further study would give the basis for his doctoral thesis. And it wasn't long afterwards that he started supervising his own research students. He has supervised 100 research students through the years, and there will probably be more.

In 1979, ten years after taking his doctorate, Jan-Åke was appointed as professor in medical nutrition.

"The relationship between diet and cancer had not previously received attention. I wanted to create a science of nutrition based on modern molecular science. Nutrition was not simply a case of counting calories."

However, letting go of the direct contact with patients and choosing research was a painful process. Meeting patients had made a strong impression on Jan-Åke, and may explain his commitment to translational research.

One person who provided invaluable support for Jan-Åke was Jerzy Einhorn. The two started collaborating at the beginning of the 1970s, and Einhorn became a close friend and mentor. Together, they studied the pattern of oestrogen receptors in

“I was probably a very demanding research student. But I did keep up a high level of production.”

tumours: “the first clinical application of my research”.

The discovery of nuclear receptors was the most important discovery in Jan-Åke’s career, and these receptors remain central to his work. They have subsequently become the target of drug development. Several trials are in progress, one of them for the oestrogen receptor ER-beta, another for a receptor known as LXR-beta. The latter receptor is important in cholesterol metabolism and it plays a role in the development of the brain, the immune system, and in Alzheimer disease.

“It is a thrilling feeling when you discover something totally unexpected. It is my dream that the discoveries of ER-beta and LXR-beta will lead to pharmaceuticals that can cure or alleviate diseases such as various types of cancer.”

Most of Jan-Åke’s time is taken up as head of a research centre in Houston, Texas, but he still has roots that reach back to Karolinska Institutet. Houston offers good clinical opportunities, including the largest cancer hospital in the world. He is looking forward to setting up collaboration between Karolinska Institutet and the research centre.



# Johan Harmenberg

Research, fencing or medicine? Not an easy choice for a twenty-year-old. He ended up choosing all three. Initially, it was fencing that took up most of his time. And so it was that Johan Harmenberg became both world champion and Olympic gold medallist in épée.

**Johan Harmenberg** was born in 1954 and took his doctorate in 1982 with a thesis covering the mechanism of action of the antiviral agent acyclovir. He is a qualified doctor, and has held a number of leading positions in companies such as Astra, Pharmacia & Upjohn and Medivir AB, with responsibility for clinical studies. He became managing director of the pharmaceutical company Axelar AB in 2007. Johan Harmenberg has combined research and development with an active sporting career. He has been both world champion and Olympic gold medallist in épée.

**JOHAN HARMENBERG HAS A MULTI-FACETED BACKGROUND.** He has switched scene often, both as a student and as a scientist, and describes himself as curious while remaining focused. He started medical studies at Karolinska Institutet straight after upper secondary school, tired of it after one week and left for the US. He was there a year and studied, among other subjects, maths, physics and computing at the Massachusetts Institute of Technology, MIT, then returned to Sweden and took up his medical studies again. He brought home a totally new fencing technique, one that he had developed in collaboration with a trainer in the US. Three years later in 1977, he became world champion in épée, in both team and individual events.

“I had at the time already started to work in research, but I had my sights set on taking the Olympic gold in 1980. I also wanted to go back to MIT, and I travelled there in the autumn of 1978 as a research student. One of the teachers was Nobel laureate David Baltimore. Another teacher was Robert Weinberg. One

of the tasks he gave me was to catch mice in the basement of the student residence. He needed the mice for his research.”

Johan took courses in subjects that included biochemistry, immunology, virology and tumour biology. His research focused on antiviral agents, initially against herpes simplex, and the results he obtained have contributed to today's new drugs against oral herpes.

He came back to Karolinska Institutet and his medical studies after taking Olympic gold in 1980. The years that followed saw further interruptions in his studies. Research was much more interesting. Johan's supervisor was Britta Wahren, head of the Department of Virology at the Swedish Institute for Infectious Disease Control. And he was supported by Bo Öberg, who was working at the time at Astra on antiviral agents. Johan's thesis covered the mechanism of action of the antiviral agent acyclovir.

And so Johan switched scenes several times while he was a research student, and he believes that this

“Another teacher was Robert Weinberg. One of the tasks he gave me was to catch mice in the basement of the student residence. He needed the mice for his research.”

was a major advantage. Eventually, he did indeed complete his medical training, taking 17 years to achieve his licence to practise, having spent a lot of that time doing other things.

The next step for him was a natural step, following on from his research into pharmaceuticals. His new career was to be in clinical trials. The pharmaceutical company Roche needed someone who could lead clinical trials, and contacted Johan. He ended up spending some years there. Management positions at several pharmaceutical companies involved in drug development and patient studies followed, until he became managing director for the relatively young company Axelar AB in 2007. This was a company within the Karolinska Institutet's sphere of influence.

He hasn't yet hung up his épée, and has won several European veteran championships, and other tournaments.



# Jan M. Lundberg

Jan M. Lundberg realised while a research student how important it is to build a bridge between pure research and clinical reality. We use the term “translational research” for this today, but the concept hardly existed 30 years ago.

**Jan M. Lundberg** was born in 1953 and took his doctorate in 1981 with a thesis that dealt with co-existing neurotransmitters in the autonomous nervous system. He was appointed professor of neurotransmission research at Karolinska Institutet in 1992. He is one of the founders of the Aerocrine AB company. Jan M. Lundberg moved to Astra in 1995 and continued his career in applied pharmaceuticals research, holding, among others, the post of global preclinical research manager at AstraZeneca. He was a member of the government committee dealing with research policy. He became global research manager at Eli Lilly, USA, in 2010. His leisure time is filled with hunting, fishing and cross-country skiing. He has competed in the Vasalopp 19 times.

**ONE SPECIAL EVENT** prompted Jan M. Lundberg to abandon his medical studies in Gothenburg. He participated in a seminar on newly discovered signal substances in the nervous system where one guest speaker was Tomas Hökfelt from Karolinska Institutet. This was in 1977. Jan knew immediately that this was what he wanted to do.

“Tomas Hökfelt was extremely important to me. He was something of a pioneer and perfectionist, and this has influenced my relationship to research.”

Jan had two principal supervisors: Tomas Hökfelt and Anders Ånggård, who carried out clinical work at the Karolinska Hospital while also working in his lab at the Department of Pharmacology at Karolinska Institutet. Jan is convinced that having more than one supervisor, preferably one who works with preclinical research and one who works with clinical research, is a great advantage. It is important as a clinician to have a solid foundation in pure research. He explains that many of the students he himself was later to supervise were

clinicians, and several of them are now clinical professors.

The period as a research student was very productive, not only within the limits of the thesis work, since Hökfelt allowed the students to try out their own wings.

“Doing research is a bit like slalom skiing – you have to find the best and simplest path. Hökfelt also had the ability to encourage commitment, collaboration and a positive atmosphere in the group. This is an experience I have since benefited from myself.”

A research student spends long hours at the lab, as well as evenings and weekends. The family had four children, and Jan’s wife, a nurse, was responsible for supporting the family. Jan sometimes took the children to the lab.

Jan received his doctorate in 1981 for a thesis on coexisting neurotransmitters in the autonomous nervous system. This was followed by an intense career at Karolinska Institutet. He continued to work on sensory neurotransmitters and pharmacological peptide receptor



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antagonists. He also worked on how nitrogen oxide, NO, and endothelin affect the air passages and the cardiovascular system. He initiated collaboration with industry at an early stage. The industrial partners could develop substances that affected various mediators and that could subsequently be developed to create new drugs. When he left Karolinska Institutet to go to Astra in 1995, Jan had over 500 publications, and was ranked as one of the most cited authors internationally. He remains so today.

“My time as a research student taught me, among other things, to strive for collaboration, to have a sense of imagination and to be meticulous. Anders Änggård, my supervisor, made a great impression on me with his experimental expertise and his commitment to the patients. Always considering what’s best for the patient – that’s what is most important for a medical researcher.”



# Mikael Svensson

An interest in the nervous system was awakened during his medical studies. Today, Mikael Svensson is professor and director of the Department of Neurosurgery at Karolinska University Hospital – one of the world’s oldest and largest centres of neurosurgery.

**Mikael Svensson** was born in 1962 and presented his doctoral thesis, which examined the role of the microglia in nerve damage, in 1993. He has been director of department at the Department of Neurosurgery at Karolinska University Hospital in Solna since 2007, with approximately 350 employees. Mikael Svensson likes sailing, and when not at sea devotes his leisure time to photography, painting and building wooden model boats. A work of precision that requires nimble fingers – ideal for a neurosurgeon.

**HE FOUND IT DIFFICULT TO RESIST** the challenges of investigating the nervous system, understanding how damage arises and how patients affected by disease or accident can be helped. Mikael Svensson was encouraged by his teachers, and chose his future pathway.

Approximately 2,500 surgical procedures are carried out at the Department of Neurosurgery each year. Half of these are emergency cases, including patients with head injuries from accidents and patients affected by stroke. The rest are planned procedures, such as surgery for brain tumours or aneurysms, and blood vessel abnormalities in the brain or spinal cord.

“Reconstructive neurosurgery is an interesting development in the field. New methods mean that the possibilities of repairing damage to the nervous system by microsurgery have increased. One example is treatment for extensive damage to the nerves that pass from the spinal cord to the arm (known as plexus damage). It is now possible to implant new nerves (grafted nerves) from the

spinal cord, and this means that the patient is not paralysed,” says Mikael.

Another example – which is still in its infancy – is surgery for patients with spinal cord injury. Mikael and his colleagues have developed a technique for the transplantation of nerve grafts using a prosthesis in the spinal cord. Severed nerves can be made to grow through this implant. The method can be combined with transplantation of stem cells in order to stimulate the growth of new nerve cells.

One of Mikael’s teachers in neurology, Håkan Aldskogius, would later become his supervisor during research education. Mikael learned the importance of being focused, planning and strategic thinking from Håkan, and he learned the importance of creating a positive working environment with both young and senior scientists, preferably scientists from different backgrounds. Mikael also did a lot of teaching during his period as a research student, and this has been valuable in developing his educational philosophy for meeting students, and meeting patients and relatives.

“My time as a research student at Karolinska Institutet was the most important period of my career.”

“My time as research student at Karolinska Institutet was the most important period of my career. Without Karolinska Institutet and the years as a research student, my career would have been completely different. I now take my role as supervisor for my own research group very seriously, since I know what research education at Karolinska Institutet means in understanding various disease conditions more fundamentally.”

Mikael's professorship in neurosurgery is the “Olivecrona professorship”, named after Herbert Olivecrona, the first professor of neurosurgery in Sweden. Mikael is responsible for the Olivecrona Prize, sometimes known as the Nobel Prize of neurosurgery, which has been awarded since 1976 to internationally renowned neurosurgeons. Mikael is also responsible for arranging the Olivecrona Symposium each year.



# Britta Wahren

The discovery that viruses can cause tumour diseases was fascinating. It also determined the direction of her research. Britta Wahren has devoted most of her career as a scientist and clinician to viruses and tumours.

**Britta Wahren** was born in 1938 and took her doctorate in 1966 with a thesis dealing with immunity against virally caused tumours, qualifying the same year as a physician. She has worked as a clinical virologist and as an oncologist at the Radiumhemmet in Solna. Britta Wahren has been head of the Department of Virology at the Swedish Institute for Infectious Disease Control, and was appointed as professor of clinical virology at Karolinska Institutet in 1992. She is participating in several EU collaborations, and is the president of an active research school under the auspices of Europrise, a European network for HIV vaccines and microbicides. Her work in collaboration with the pharmaceutical company Medivir has led to several patented inventions. She is a sports car aficionado, and drives a Pontiac Firebird.

**STARTING RESEARCH AS A YOUNG STUDENT** at the end of the 1950s could be a very informal business. Several of those who were research students at that time have confirmed this. One of Britta Wahren's fellow students suggested that she visit the Department of Cellular Research, where Torbjörn Caspersson was the head. She just happened to bump into Georg Klein instead. He picked up the phone and called a colleague Olle Sjögren, saying: 'I've got a girl here who's going to start working with you.' That was how matriculation was dealt with.

"I became immensely fascinated by how a tumour virus could give rise to immunity against cancer, as Olle Sjögren had recently discovered. I showed in my thesis work that it is possible to vaccinate against the virus that causes spontaneous leukaemia in mice. Vaccinating the mice against this RNA virus – which is very similar to HIV – prevents the development of leukaemia later in life."

Britta spent half of her period as a research student with Caspersson, and the other half with Georg Klein,

who had been appointed head of the new Department of Tumour Biology.

"Seminars were held often, and we were all expected to join in, and we were often invited to Georg and Eva Klein's home to discuss various research projects. There were no courses for research students at that time. Most people who took a doctorate then were medical students. There are many more research students nowadays, and they have taken different programmes of education. This requires a stricter structure and a completely different system."

Britta took her doctorate in 1966 with a thesis that described immunity against virally produced tumours. She was awarded the highest honours and this meant that she was automatically awarded an associate professorship. It wasn't long before she was supervising her own research students. There have been over 50 students through the years, and she is still supervisor for research students. Her philosophy as supervisor is founded on her own experiences from her period as research student – to be

“There are many more research students nowadays. This requires a stricter structure and a completely different system.”

given the chance to work independently, while at the same time having access to colleagues who work with similar issues, possibly from different viewpoints. “It is also important to be disciplined,” she says, and admits that she herself was not very disciplined when young. She learned discipline later from working with Jerzy Einhorn. He had recruited her to work at Radiumhemmet, where she worked as a clinician for many years, specialising in oncology.

Throughout her career, Britta has worked with viruses and her work has led to new diagnostic methods, new antiviral drugs, and now a promising new vaccine against HIV. Some of her research students are now working to develop the vaccine further, and she hopes that it will lead to better protection against the disease in combination with the currently available HIV disease-modifying drugs, and possibly also a prophylactic vaccine.



# Harriet Wallberg-Henriksson

Harriet Wallberg-Henriksson made an important research breakthrough while still a research student. And she continues to break new ground today, although in a rather different manner. She was appointed the first female president of Karolinska Institutet in 2004.

**Harriet Wallberg-Henriksson** was born in 1956 and took her doctorate in 1987 with a thesis that described the mechanism of sugar transport into cells. She was a sports teacher, physician, professor of physiology in 1999. She was dean of research at Karolinska Institutet during the period 1999–2001 and then principal secretary in medicine at the Swedish Research Council. She is a member of the Nobel Assembly. She was appointed president of Karolinska Institutet in 2004. Harriet Wallberg-Henriksson has an interest in physical activity that extends beyond the research lab. She has been a football coach and was a competitive cross-country skier in her youth.

**HER INTEREST IN PHYSIOLOGY WAS AROUSED** at an early age, when Harriet Wallberg-Henriksson was training to be a sports teacher. One of her teachers was P.O. Åstrand, professor of exercise physiology at Karolinska Institutet. He offered her a teaching post at the Department of Physiology, and it was here that it all began. If anyone had told her then that 25 years later she would be president of Karolinska Institutet, one of the most prestigious medical universities in the world, Harriet would have replied: “You must be joking”.

Harriet soon discovered that she needed deeper knowledge in medicine, and so she applied for, and was accepted, to study medicine.

“I had read somewhere that exercise is good for diabetics, but I couldn’t find any scientific evidence for this. So I drew up a research plan and presented it to John Wahren, who was professor in clinical physiology at the time. He thought it was a good plan, so it was simply a matter of starting work in his group. He was to be one of my thesis supervisors.”

This was in 1979. The thesis was nearly finished after a couple of years, when Harriet interrupted the work and travelled to Washington University in St. Louis, USA. She put the clinical studies on hold and now started to work exclusively on experimental studies. Her supervisor in the US was John Holloszy. One of her discoveries was that muscular work, exercise, affects glucose absorption and insulin sensitivity, and she was able to determine the mechanism. She showed that it takes place through special transport molecules, which facilitate the passage of sugar into muscle cells. This was to be the subject of her doctoral thesis. The original plan had been that the thesis would concentrate on the clinical studies she had carried out. In fact, the thesis now came to deal with the experimental studies. Her research has contributed to a new perspective in treating type 2 diabetes in particular, and the development of drugs in use today that target the muscle cells.

Both of her supervisors were extremely good role models.

“I hope that I can inspire all those young men and women who today stand on the threshold of their research careers.”

“John Wahren had excellent qualities for leading a team, he let me take on a lot of responsibility, and always supported me. He let me present my results at major conferences throughout Europe, and I got to meet the best scientists in the field. This was really inspiring. John Holloszy taught me to think critically about research and the results I had obtained, to see the relationships between my results and previous knowledge, and he emphasised how important it is to really study the literature.”

Her period as a research student was highly significant for her career. It taught her, among other things, different ways of solving problems, to pick up all the important information, and not to jump hastily to a less than properly considered conclusion.

“Role models are important,” says Harriet, “and the president of Karolinska Institutet is a very public person, for better and for worse. I hope that I can inspire all those young men and women who today stand on the threshold of their research careers.”



# Sarah Wamala

The journey has been a long one. Sarah Wamala has followed a pathway from childhood in a small village in Uganda, escape to Sweden, and an intensive research career. For the past few years she has been director-general of the Swedish National Institute of Public Health.

**Sarah Wamala** was born in 1967 and has degrees in economics and biostatistics. She presented her doctoral thesis, which examined socio-economic status and cardiovascular vulnerability in women, in 1999 at Karolinska Institutet. She became associate professor in community medicine in 2002, with a focus on public health science and social epidemiology. Sarah Wamala has been head of the Department of Health Promotion and Disease Prevention at Stockholm County Council and has been associated with Karolinska Institutet as a researcher. She was appointed director-general of the Swedish National Institute of Public Health in 2008. Sarah Wamala is also green-fingered: just now she's working hard on African spinach.

**SARAH WAMALA CAME TO SWEDEN** aged 20, bringing with her a degree in economics from Makerere University in Kampala. She realised at an early stage that the economic circumstances that control a person's life have an enormous significance for health and well being, and this realisation led to a desire to study more deeply how society's structures and other psychosocial factors affect health. Sarah immediately started to learn Swedish and study biostatistics at Stockholm University. It was as part of these studies that she found herself carrying out work-place studies at what was then the Department of Psychosocial Environmental Medicine at Karolinska Institutet. It was here she met Kristina Orth-Gomér, who was carrying out research into women and cardiovascular disease. Kristina would subsequently become Sarah's supervisor.

"At the time, there wasn't much published about the links between work, career and cardiovascular disease, particularly not for women. This may be the reason that my thesis aroused quite a bit of attention when I presented it in 1999," says Sarah.

The thesis shows, among other results, that women with low education and women in unqualified jobs run a four times greater risk of suffering from coronary artery disease than women with higher education. They have a less healthy composition of blood fats, higher blood pressure and a higher risk of experiencing a recurrence of heart attack. Women with poor education also had a higher rate of divorce, were more often the subject of violence, and experienced marital problems more often than women with academic qualifications.

"Kristina Orth-Gomér was an excellent supervisor: she really helped my development. She encouraged me to take courses abroad, including courses at the School of Public Health in Cambridge and at Tufts University, near Boston. These were high-intensity months from which I really gained a lot," says Sarah.

Her experiences as a research student and later as a scientist convinced her that we must invest more in preventative medicine, and this should also be reflected in medical education. Doctors today are primarily educated to treat disease, not prevent it.



“We must invest more in preventative medicine, and this should also be reflected in medical education. Doctors today are primarily educated to treat disease, not prevent it.”

“We must reward those who promote health. It’s just the opposite at the moment – local health centres earn more when they have many patients who visit.”

One of the tasks of the Swedish National Institute of Public Health is to provide the information required for politicians to take the right decisions concerning the promotion of health among the population. Much of this is based on statistics and scientific evidence. Sarah regards it as a major advantage that she was able to meet many women during her time as a research student and gain insight into their situation, and how their health is affected by socio-economic class and other circumstances. She points out how important it is not to view statistics solely as numbers: these numbers must be coupled with a understanding of what they mean in terms of individuals.

Sarah has broadened the perspective of her research in recent years: she is now, for example, principal investigator on a research project nearing completion looking at the effects of globalisation on women’s health in southern Africa.



# Barbro Westerholm

With hindsight, Barbro Westerholm can conclude that learning how to interpret data, how to analyse an argument logically, and how to recognise the strengths and weaknesses of a document are probably the most important experiences from her time as a research student. These skills have proven to be invaluable.

**Barbro Westerholm** was born in 1933 and trained as a doctor before taking a research doctorate in 1964 with a thesis that dealt with the release of substances during allergic reactions. Her appointments have included that of director-general of the National Board of Health and Welfare, medical head at Apoteksbolaget, and vice chair of the WHO board of governors. Barbro Westerholm has also been chair of the Swedish Pensioners' Association, and represents the Liberal Party of Sweden in the Swedish parliament, where she is a member of the Committee on Health and Welfare and the Committee on Education. Her leisure time revolves around boats, preferably sailing, and spending time in the Stockholm archipelago.

**WHEN BARBRO WESTERHOLM COMPLETED HER MEDICAL TRAINING,** she initially planned to go into clinical work, preferably as paediatrician. But it was not to be. A number of research scholarships became available around the time that she completed her training. The pathway to becoming consultant was easier with a research doctorate, so Barbro applied and was accepted as a research student.

Börje Uvnäs at the Department of Pharmacology was assigned as her supervisor. One of the topics he was working on was what happens in the skin when it is stung by jellyfish or stinging nettles. It was this that determined the choice of topic for Barbro, and her thesis examined the release of substances during allergic reactions.

“The thesis wasn’t actually that original,” admits Barbro. “The research I’ve done since then has been in a completely different league. My later work has mainly concerned pharmaceutical epidemiology, and I have been privileged to work with the world’s leading epidemiologists.”

It was Börje Uvnäs who intro-

duced her to the field. Barbro also worked as a midwife and assistant nurse while working as a research student, and Börje did not consider that a pharmacologist should be involved with such work. So he arranged for her to be appointed as presenting physician for pharmaceutical cases to be considered by the National Board of Health and Welfare.

“This commission determined my future. After I received my doctorate, Börje Uvnäs suggested that I get involved in Swedish pharmaceuticals control. So I postponed the idea of clinical work once again.”

There was an intense debate at the time concerning the side effects of drugs, particularly in the wake of the thalidomide tragedy. The National Board of Health and Welfare appointed a working group chaired by Uvnäs and with Barbro as secretary. The task of the group was to propose a Swedish pharmacovigilance system. The system initially dealt with the side effects of oral contraceptives, and was the starting point for Swedish epidemiology.

“We were able to identify and pre-

“The supervisor challenged us, backed us up when we made mistakes, and defended us from outsiders.”

vent several pharmaceutical adverse effects. This work also involved me participating regularly in meetings arranged by WHO.”

Thus, Börje Uvnäs was to become a key figure.

“He challenged us, backed us up when we made mistakes, and defended us from outsiders. He gave us credit for our successes and looked after us when we failed. After the dissertation, he would discuss the future with each one of us.”

Barbro emphasises how important it is to have fun in the workplace and create a positive atmosphere.

“I remember vividly a Christmas party with the Nobel laureates that was held in one of the pharmacology labs. At one stage the mulled wine caught fire as it was being heated in a fume cupboard. The cupboard exploded and showered glass fragments over all of us, including one of the Nobel laureates.”

“The years as a research student were like a rollercoaster ride with its ups and downs. But most of all – it was fun!”



# Hans Wigzell

It was an extremely intense research environment. A hothouse for young scientists. His period as research student at what was then the Department of Tumour Biology gave Hans Wigzell a flying start to his research career.

**Hans Wigzell** was born in 1938 and took his doctorate in 1967 with a thesis that covered the control and regulation of the immune system. He completed his medical studies at the same time. He was appointed to his first professorship of immunology five years later, in Uppsala. He was appointed as professor of immunology at Karolinska Institutet in 1982. Hans Wigzell's posts have included that of head of the Swedish National Laboratory of Bacteriology and the Swedish Institute for Infectious Disease Control, chairman of the Nobel Committee, president of Karolinska Institutet and scientific advisor to the Swedish government. He is a member of the management team at the investment company Karolinska Development. He has also participated in popular scientific theatre.

**HANS WIGZELL ENDED UP WORKING WITH GEORG AND EVA KLEIN** pretty much by chance. He had started medical studies but found the lectures boring, and was looking for something else to do. A neighbour who worked at Karolinska Institutet suggested that he pay a visit to Georg Klein and the Department of Tumour Biology.

“So I wandered in there, posed a pile of questions, and Georg made me welcome on the spot.”

Hans describes how the environment there was extremely creative. He soon realised how little was known about how the immune system works, despite the important role that it plays in many different contexts – transplantation, vaccination, allergies, tumour development, etc. This determined the direction of his research.

The first challenge was to identify tumour-specific antigens. And now things started to really heat up. Hans published his first scientific article – he was sole author – as early as 1961, dealing with immunological reactions in leukaemia. A few years later

he discovered, in collaboration with Eva Klein and Rolf Kiessling, a new type of cell, the NK cell, which is a white blood cell that attacks tumour cells.

Hans admits to an ever-present childlike curiosity.

“What is most fascinating is to connect results from different experiments and suddenly discover a previously unthinkable relationship. It's really exciting when that happens!”

Hans didn't have an official supervisor when he was a research student. But he always felt strong support from Georg Klein – who was an important role model – and the rest of the research group. Hans believes that the most important part of research education lies in the actual research activities, in participating in discussions and seminars, and travelling to conferences.

“We were a gang of young research students, all around 25 years old, internationally known as ‘Klein's Kids’. All of us came from this creative environment, where the lights were often burning until late at night. It was an electrifying pace.”

“Having top-flight grades does not guarantee that you’re suitable for work in research. Someone who is a bit of a weirdo can prove to be extremely talented.”

Spending some of the research student period abroad can give new impulses. After a few years at the Department of Tumour Biology, Hans was awarded a research post in England. The different environment there made a deep impression on him. One aspect was the way in which scientists from different subjects would meet in the pub on Friday nights: the discussions were often lively and could stimulate the conception of completely new ideas. One of Hans’ results at this time was the development of a technique for measuring cell death (using Chromium-51), a technique that is still used all over the world.

Hans doesn’t believe in too formal a system for research education – this introduces a risk that talented scientists are missed. “Having top-flight grades does not guarantee that you’re suitable for work in research. Someone who is a bit of a weirdo can prove to be extremely talented.”



# We were all PhD students...

TWELVE PERSONAL STORIES

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**Produced by Karolinska Institutet 2010**

Editor: Lena Lewin, Faculty Office – Research and Doctoral Education | Text: Ann-Marie Dock | Translation: Tamarind Translations

Design: Sofia Lindberg, The Information and Public Relations Office | Print: DanagårdLiTHO | ISBN: 978-91-85681-26-6

Photo: p. 4, 7, 11, 15, 23, 25 and 27: Camilla Svensk, p. 5, 13, 17, 19 and 29: Bildmakarna, p. 21: Gustaf Andersson, p. 9: Ylva Sundgren



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