



Rudolf Magnus Institute of Neuroscience

Rudolf Magnus Bulletin 32 May 2007

interview

From biologist to Professor in medical education

Gerda Croiset, working at the division of Neuroscience, department of Pharmacology and Anatomy, has been appointed as Professor in the field of medical education since the first of June 2006. April 25th she gave her view on the medical education system in her 'oratie' (oration) entitled "Dokter Plus".

Gerda Croiset obtained her MSc. in Biology in 1985 and started her career within the Rudolf Magnus Institute for her PhD training. She defended her thesis, entitled: "The impact of emotional stimuli on the immune system" in 1989 and remained within the Institute as postdoctoral fellow till 1992. In the meantime she studied medicine, and in 1995 she became a MD. She, however, didn't practice medicine, but started to concentrate on the educational part of the medical training. She became a senior lecturer in 2002 and has now been appointed full professor.

I asked Gerda to describe how she became involved in teaching and what to her account led to her appointment as professor in medical education at the Utrecht University. "In 1999 a new medical program had to be implemented, this was the start of my educational career. Although a lot of people warned me, that it would be the end of my scientific career I decided to put a lot of my time and energy in the development of educational programs. And I have never regretted it. After this decision I followed a lot of courses to become a professional in teaching, management and coordination, and educational policy. I was one of the first to follow the CEUT program (Certificaat Centre of Excellence in University Teaching) of the Utrecht University. In the meantime I got acquainted with a lot of people within the University and participated in a lot of different discussions concerning education in all kind of platforms. This has resulted in two main achievements which I would like to mention here: the development and start of the biomedical prestigious research master Neuroscience & Cognition and the development of the medical program SUMMA."

In 2003 the bachelor/master structure has been introduced at the Utrecht University. Within the medical faculty this has resulted in the introduction of 10 biomedical research master programs. Gerda was asked to develop a neuroscience orientated master program. She started with the idea of developing a master program UMCU based, however, she was told that neuroscience at the Utrecht

University was not only the UMCU and if she could not incorporate all the other neuroscience elements present at the University as well. Together with Edward de Haan of the Helmholtz Institute she accepted the challenge to develop one coherent and logic master program in which 6 faculties and three institutes participate all with a complete different view on neuroscience. In the end they were very successful and established a very broad and interesting research master program, the master Neuroscience and Cognition. The program consists of two years with a (broad) theoretical component and a large practical component, and gets attention throughout the Netherlands and internationally. In 2004 the master was rewarded as one of the few prestigious master programs of the Utrecht University.



Gerda Croiset

The second program she was largely involved in was the development of an educational program training students to become at the same time clinician and research scientist, the SUMMA. With Gerda's background, being both a PhD in biomedical sciences and a MD, she was the perfect person to make such a program happening. The idea of a four-years medical program was revolutionary both in the Netherlands, since it was new to be MD in four years, and in the world, since it combines the medical with the research training. Since the program is very demanding the bachelor students are heavily selected, only the top Life Sciences bachelor students stand a change of being selected and on top they have to be highly motivated to become both a researcher and a clinician. In the beginning this was hardly accepted, however, after a couple of very successful years running the program, with highly motivated and excellent students, she has proven that this concept really works.

PhD theses

2007-11

May 10, 2007

Theo van Erp

Hippocampus and memory abnormalities in schizophrenia contributions of genes and environment

R.S. Kahn, N.F. Ramsey and H.E. Hulshoff-Pol
supervisors

Theo van Erp performed his PhD in the department of Psychiatry and completed his thesis in the section of Developmental Disorders. Currently he works at the University College of Los Angeles.

The main finding described in the thesis of Theo van Erp is: that lack of oxygen during birth in combination with a high genetic risk for the development of schizophrenia results in a smaller hippocampus. This area of the brain is involved in memory. Twin studies have shown that the size of the hippocampus is genetically determined. In schizophrenia patients this genetic load has been determined at 42%, whereas in healthy people this is even higher with 71%. On top of this, studies have shown that as well patients as their healthy twins show memory deficits partly correlated with the lesser volume of the hippocampus.

The presented research shows that hippocampus and memory deficits found with schizophrenia patients are partly influenced by genes which increase the risk on the development of schizophrenia and partly by environmental factors.

2007-12

May 24, 2007

Sophie van Rijn

Xploring social cognitive pathways to psychopathology studies with Klinefelter (XXY) men

R.S. Kahn, A. Aleman, E.H.F. de Haan and H. Swaab
supervisors

Sophie van Rijn started her PhD in august 2002 after her training in cognitive neuroscience. She completed her thesis in the section Developmental Disorders at the department of Psychiatry. She currently holds a position as assistant professor at the department of Clinical Child and Adolescent Studies at Leiden University.

De novo occurring genetic variations provide an opportunity to study the effects of genes on brain development and behavior. In this regard, Klinefelter syndrome, characterized by a XXY chromosomal pattern, is of significant interest. Although intelligence in XXY men is generally within the normal range, specific effects on brain structure, cognition and behavior have been observed. The most prominent behavioral problems are found in the domain of social adaptation. In a series of experiments we have investigated social cognitive capacities dealing with language, emotion and social insight in XXY men. As disabilities in social cognition and social behavior are characteristic of autism spectrum- as well as

schizophrenia spectrum disorders, we also examined whether XXY men display increased levels of autism- or schizophrenia spectrum pathology.

We observed deficits in various domains of social cognition in XXY men, which may contribute to the difficulties in social interactions that have been described for these men. For instance, XXY men were less able to recognize emotions from facial expressions and tone of voice in speech. With regard to the neurobiological underpinnings, reduced activation in brain regions important for social information processing (the amygdala and fusiform gyrus) as well as reduced hemispheric lateralization for language was found in XXY men using functional MRI. Our findings indicate profound social cognitive deficits, underlying functional brain abnormalities, and increased autism- and schizophrenia-related psychopathology in XXY men. The extra X chromosome in Klinefelter syndrome may play a role in abnormal development of some of the brain mechanisms involved in language, emotion and social behavior, which are considered core domains of disabilities in autism and schizophrenia. Although speculative, studying Klinefelter syndrome might help us understand pathways from genes to psychopathology in the autism- and schizophrenia spectrum.

news and other things

Louk Vanderschuren receives Top-grant

Louk Vanderschuren, from the department of Pharmacology and Anatomy, has received a Top research grant from ZonMW (the Netherlands Organisation for Health Research and Development), for his proposal entitled "Maladaptive changes in striatum and cortex function in the development of cocaine addiction".

Drug addiction is an enormous health problem, but an effective pharmacotherapy for addiction is at present not available. A hallmark feature of drug addiction is the loss of control over drug taking, apparent as continued drug use despite adverse consequences. Previously, Louk Vanderschuren has shown that rats with extensive cocaine self-administration experience are indeed resistant to adverse outcomes, because their cocaine seeking was not affected by presentation of an aversive stimulus- unlike animals with only limited cocaine experience. In the present project, this model of compulsive drug seeking will be used to test the hypothesis that distinct neural circuits mediate drug seeking in animals with a limited vs. an extended cocaine taking history. To that aim, a combination of behavioural, functional neuroanatomical and molecular approaches will be used. The ultimate goal of this research is to contribute to the development of new pharmacotherapeutic strategies that specifically interfere with the compulsive aspects of drug use, thus targeting drug addiction at its core. This project will be carried out in collaboration with Pieter Voorn (VUmc, Amsterdam) and Guus Smit (VU, Amsterdam).

Linda Verhagen receives New Investigators Award

Linda Verhagen, PhD student at the department of Pharmacology and Anatomy received a New Investigators Award for her research abstract titled: "Food-anticipatory activity during activity-based anorexia", which she will present at the Society for the Study of Ingestive Behavior (SSIB) meeting this July.

At the meeting she will present data on her research into the role of dopamine in a rat model for anorexia nervosa, the so called activity based anorexia model (ABA). This research has been based on prior research in anorexia nervosa patients in which it has been shown that treatment with a dopamine/serotonin ligand is very effective. Treatment results in a reduction of hyperactivity, amount of stress and hypothermia. Linda shows that a blockage of the dopaminergic system in the brain results in reduction of hyperactivity, and a remainder in the drive to eat.

Myrthe Merkestein receives Top-Talent scholarship

Myrthe, student from the master program Neuroscience and Cognition of the Institute, has been rewarded by NWO with a scholarship for her PhD training for her research project entitled: 'What happens in our brain when we get ready for dinner?' She will perform her training in the group of Roger Adan at the department of Pharmacology and Anatomy.

Publication in Nature

Recently an article with Jeroen Pasterkamp of the department of Pharmacology and Anatomy has been published in Nature.

The first results of an ongoing collaboration between Osaka University (Japan), the Johns Hopkins University School of Medicine (USA) and the Rudolf Magnus Institute of Neuroscience were recently published in Nature (April 2007). The paper describes a novel and surprising role for the "neuronal connectivity" protein Semaphorin7A in immune system function and disease.

Jeroen Pasterkamp, comments:

A few years ago we identified Semaphorin7A (Sema7A) as a protein essential for axon tract formation in the developing nervous system (Nature 2003). At that time it was already becoming clear that Semaphorins can also mediate functions unrelated to neuronal connectivity, for example in the immune system. We therefore teamed up with our Japanese colleagues to take a closer look at a potential role for Sema7A in immune system function and disease. To our surprise we found that neurons and immune cells use the same receptors to detect Sema7A, resulting in the activation of highly similar signal transduction pathways. These results underscore that the immune and nervous systems share molecular resources and that studying these molecular relationships may provide valuable insights into function and disease in both systems. In line with this idea we are currently following up on the observation that Sema7A acts at the immunological synapse. Given the prominent expression of Sema7A in

the postnatal and adult brain we believe that Sema7A may also be critical for integrity and function of neuronal synapses. This is presently under investigation at the department of Pharmacology and Anatomy.

Brain Awareness week

Several neuroscientists from the Rudolf Magnus Institute participated in Brain Awareness Week School visits. During one day they gave lectures at a high school in their neighbourhood, or their own former high school. Three short impressions of this day:

Ruud van den Bos working at the department of Ethology and Welfare of the Faculty of Veterinary Sciences visited the Lorentz Lyceum in Arnhem

When Mariken de Krom announced by mail that during the Brain Awareness Week school visits were scheduled, I responded immediately with a positive reply. For, I firmly believe that we as university researchers and teachers should take every opportunity to get into contact with the next generation of students and convey our message in an easy and concise way. It is easy to score among the interested peers, yet it is a challenge to interest others and explain why it is so important what we do. So, I set out to Arnhem on Thursday 15th March to visit The Lorentz Lyceum to tell a tale of the brain of modern Ulysses to 25 VWO-6 students. How to stay on target, while rewards in the world persuade you to do otherwise or, in other words, how to stay on track while your brain is lured into getting on fire all the time. The story apparently went down well as later on I received a very positive mail from Kees Strijker, the biology teacher of this class. Rather than waiting for the next Brain Awareness Week, we may think of organising more of this kind of teaching opportunities ourselves.

Marten Smidt from the department of Pharmacology and Anatomy visited a high school in Breukelen.

Title of the talk: Molecular mechanisms in central nervous system development. I was invited by the organiser from the "brain awareness week" to participate in a program where researchers would give a lecture on their "old" high-school. Since my high school is located in "Friesland" I opted for a high school near my work place (Utrecht). After some time I was invited by the biology-teacher from a "VWO" in Breukelen. She asked me to give a lecture about my research efforts to a senior "VWO" class (year 6). Arriving at the school I wondered how this experience would influence my view on how school kids appreciate biology, so also for me it was a little experiment. Starting the lesson, most students were interested and clearly exited about what was about to happen. In the beginning of the lesson the teacher explained what I would do and told everyone that it might run late. All the students were ok with that and wanted me to start.

Immediately after I started, the students tried to get more information that fits their own interest. Since I also spoke a bit about developmental effects of drugs of abuse, the students wanted to know everything what would happen if they would take these types of substances, also about alcohol. The lecture went so well that they didn't want me

to stop and kept on asking more questions about the topic of brain development. Also after I finished the lecture several students were waiting to speak to me about the things they had heard and to ask more relevant questions. My personal feeling about the morning was very positive. The students were eager to learn and had a fair amount of natural interest into the topic. I had the idea that this positive feeling was mirrored by the students and the teacher.

I think that this initiative "the brain awareness week" is very good and might have successors in other fields or research. This might be a very good way to inform younger students about the possibilities in research and to make them aware of what is happening in research institutes.

Tom Roeling, from the department Pharmacology and Anatomy, visited a high school in Nijmegen.

On the Monday of the brain Awareness week I gave a lecture about the neuroanatomical substrate of feeding disorders, entitled: Why do we eat? (and why don't we). The audience was a group of 17 year old students. Besides my own lectures a second lecture was scheduled by an emeritus professor in psychoneuropharmacology. He gave an overview of the research on dopamine and psychiatric diseases. I was pleasantly surprised by the fully equipped auditorium and the interested students present. I was a bit afraid they might lose interest after one lecture; however, they stayed interested and quiet all through the meeting. Instead of giving a high intellectual lecture I focused mainly on my own curiosity in aspects of my research. Unfortunately due to time I was not able to give an demonstration on neuroanatomy as I had planned, better next time. The students had plenty of questions afterwards and it was clear they understood what I had been talking about. No doubt we can welcome at least some of them in the inner circle of neuroscientists before long. And as for next year: where can I enlist?

University Day 2007: "Denken in Beeld"

Theme of this year's University Day, 31st of March 2007, was 'the art of thinking'. Each year the University organizes the University Day just after the celebration of the *Dies Natalis* for his former students, the so called alumni. The goal of the day is to inform the alumni on new developments within research and education within the University of Utrecht, of course all with a high social character. This year the University Day for the medical faculty has been organized by the Rudolf Magnus Institute. The program consisted of a lecture series on particular topics in the Neuroscience field, among others Magriet Siskoon, author of the bestseller "Het maakbare brein", followed by a afternoon with five different workshops, so called 'brainshops'. A total of 150 Alumni, mostly physicians, from all age-groups listened with great attention to the speakers and were very enthusiastic and actively involved during the 'brainshop' sessions. The atmosphere during the whole day was very good and thanks to the special effort of the researchers of the Rudolf Magnus Institute the day was a real success.



Researchers from the Institute gave workshops on their field of work

Rudolf Magnus Graduate School Certificate

The Director and the Research Training Committee of the Graduate School took pleasure in presenting the Rudolf Magnus Graduate School Certificate to the following Doctors:

Jeannette Hofmeijer (April 16, 2007), Marion Scholten (April 23, 2007) and Sven Schiemanck (April 26, 2007).

agenda and announcements

May 7, 2007 Neuroscience seminar

Jennifer Raymond,

'Multiple, distinct components of cerebellum-dependent learning,

ErasmusMC, Rotterdam, Colloquium room K
16:00, tea and coffee from 15:45

more information: <http://www.erasmusmc.nl/neuro/>

May 10, 2007 Neuroscience meeting

Language, Cognition and Parkinson's Disease: A Multidisciplinary Meeting, Groningen

more information: <http://www.let.rug.nl/parkinson/>

May 6-12, 2007 'Nationale Hersenweek'

Theme: Brain in motion ('Hersenen in beweging')

More information: <http://www.hersenstichting.nl>

May 8-11, 2007 Genetics and Imaging

Integrating imaging and genetic in cognitive research

Amsterdam

More information: <http://www.imaginggenetics.org>

May 17-20, 2007 Neuroscience conference

Applied Neuroscience for healthy brainfunction, Nijmegen

More information: <http://www.appliedneuroscience.nl>

May 23, 2007 Research Lunch Psychiatry

Research lunch department of Psychiatry

Aula Psychiatry, UMC Utrecht
12:30, lunch provided

contact, i.sommer@umcutrecht.nl

May 23, 2007 Swammerdam lecture

Edvard Moser, (University of Trondheim, Norway)

'Entorhinal grid cells and hippocampal memory: how do we keep track of where we are?'

ONWA Amsterdam

more information: <http://www.onwa.med.vu.nl/swammerdam>

May 31, 2007 Symposium visual perception

Coherent visual perception: from early integration to higher stages of visual analysis

Faculty of Social and behavioural Sciences UvA

More information:

<http://www.fmg.uva.nl/psychonomics/SymposiumVisualPerception.cfm>