G.F.S.V.
PHARMACIAE SACRUM
SINDS 1881

Dies Scientific Symposium

"The MeloDIES of Audiology"

February 8, 2023

Program Dies Scientific Symposium
"The MeloDIES of Audiology"

9:00 - 9:30	Welcome	
9:30 - 10:00	Opening	
	Praeses 141st Dies Natalis	S.A.L. Wever
	Praeses G.F.S.V. "Pharmaciae Sacrum"	M.J. Boerrigter
	Chairman	Prof. dr. A.J.W. Scheurink
10:00 - 10:45	**Dr. ir. E. de Kleine** *Spontaneous otoacoustic emissions (SOAEs) in the research of carbamazepine and pitch perception.*	
10:45 - 11:15	Coffee Break	
11:15 - 12:00	**Prof. dr. ir. D. Baskent** *Music therapy for medical rehabilitation in audiology.*	
12:00 - 12:45	**S.J. van Tuinen-Pyott** *Development of new pharmaceutical strategies to prevent and treat hearing disorders*	
12:45 - 13:30	Lunch break	
13:30 - 14:15	**Prof. dr. P. van Dijk** *The relation between tinnitus and brain function, an overview of (f)MRI studies.*	
14:15 - 15:00	**Dr. M. van den Berge** *Auditory brainstem implant (ABI) as an implant for hearing improvement.*	
15:00 - 16:00	Closure with a drink	

Preface

Praeses 141st Dies Committee "Relive MeloDIES"

Dear reader,

This year we celebrate the 141st anniversary of our study association. This year, the theme will all be around 'Relive MeloDIES', celebrating together on tunes that never get old. Monday, we celebrated the start of the Dies with the Opening Party. Today, it is time for the scientific symposium. This scientific symposium is connected to "Relive MeloDIES" by discussing different topics about "The MeloDIES of Audiology". Our committee was very interested in this not frequently handled issue in the pharmacy. What types of hearing conditions are there and are these possible to redeem with medication or other types of therapy? Also, there is great interest in whether medication may influence hearing, and how this possibly works. Besides, is it possible to use music as a therapy? In the lectures, knowledge and experiences from our speakers are shared.

At first, Dr. ir. Emile de Kleine will talk about how patients who use carbamazepine experience a change in pitch. With a special technique called 'spontaneous otoacoustic emission' this phenomenon is studied, and this will be discussed by the use of case reports.

In her talk, Sonja van Tuinen-Pyott will share new insights into the pathophysiology of hearing loss and how these insights are being used to develop new pharmaceutical strategies to prevent and treat hearing disorders. Prof. dr. Pim van Dijk will tell us about the relationship between tinnitus and brain function. He will enlighten this in an overview of (f)-MRI studies. Furthermore, Dr. Minke van den Berge will elaborate on the therapy for tinnitus, by informing us about the 'Auditory Brainstem Implant'. Also, she will include a form of neurostimulation in which the auditory nerve was directly stimulated with a ring electrode, as a possible treatment for tinnitus. Lastly, Prof. dr. ir. Deniz Baskent will talk about a form of hearing loss therapy, different from implants. In her lecture, she will disclose using music therapy and music training for rehabilitation in audiology. This she will do by presenting relevant literature and her own work on music therapy and training in audiology, while discussing such important clinical care questions.

The scientific symposium will not last without a chairman. Prof. dr. Anton Scheurink will function as chairman of the day to lead us through all the facets of audiology, in which we learn how this is present in current health care.

We, as a committee, look forward to the scientific symposium and thank the speakers that are willing to discuss their own fields of expertise.

With kind regards,
On behalf of the 141st Dies Committee of G.F.S.V. "Pharmaciae Sacrum",

Susannah Wever
h.t. praeses

Preface

Praeses 141st board of G.F.S.V. “Pharmaciae Sacrum”

Dear reader,

On behalf of the entire board, I would like to cordially welcome you to the Scientific Symposium in honor of the 141st Dies Natalis of Pharmaciae Sacrum. The Dies Committee has been busy for a year shaping this Dies Natalis week, including the Scientific Symposium. Every year the scientific symposium is organized to broaden our knowledge about the pharmaceutical workfield. This starts with coming up with an interesting and original theme. This scientific symposium is dedicated to the theme “The MeloDIES of Audiology”, which is based on the theme of the Dies Natalis, “Relive MeloDIES”.

Various speakers will shed light on this theme from their field of expertise. The subject of audiology is strongly connected to our brain function. Hearing damage leads to a high risk of tinnitus, due to an overworking and overactive brain. In therapy, music can be used to induce neuroplasticity in our brain. In audiology this music therapy may induce the perception of emotions or speech. Furthermore, as prevention and treatment, regenerative medicine can be used to reverse hearing loss. Another aspect are implants in the brain that make hearing possible for people who are totally deaf and don’t benefit from other aids. In all, there is a lot known, however there is also much room for development. All these topics will be discussed during this day, which makes the scientific symposium inclusive and broad.

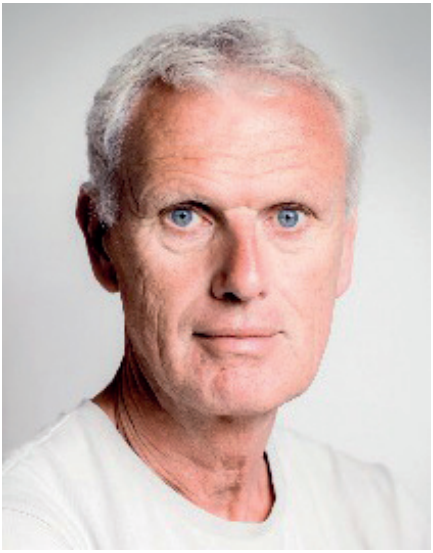
Finally, I want to congratulate the committee with the organization of this scientific symposium. I wish everyone an educational and fun day, by keeping yours to the ground.

Kind regards,
On behalf of the 141st board of G.F.S.V. “Pharmaciae Sacrum”,

Myrthe Boerrigter
h.t. praeses

Chairman

Prof. dr. A.J.W. Scheurink



Curriculum vitae

Prof. dr. A.J.W. (Anton) Scheurink is professor in neuro-endocrinology at the Centre for Behaviour and Neurosciences. He studied Biology at the Rijksuniversiteit Groningen (RUG) and earned his PhD in Animal Physiology, finishing both cum laude. After a period as postdoc in the United States he returned to the RUG as a professor in 2011 and has worked there since. He also was head research coordinator of the anorexia center at the Karolinska institute in Stockholm. Prof. dr. Scheurink specializes in the neural control of energy regulation in the body and the regulation of body weight (with a special focus on eating disorders). In January 2015 he was elected as lecturer of the year. Prof. dr. Scheurink is also president of the Examination Committee of Biology and Life Sciences & Technology, coordinator of the B-track research master Behavioral Cognitive Neurosciences, member of the Examination Committee of the research master Behavioral Cognitive Neurosciences and president of the Admission Committee for the master Biomedical Sciences.

Dr. ir. E. de Kleine

Spontaneous Otoacoustic Emission (SOAEs) in the research of carbamazepine and pitch perception

The lecture will cover three different topics: absolute hearing, carbamazepine (CBZ) and otoacoustic emissions. Case reports describe that patients who start taking CBZ sometimes notice that their perception of pitch changes (about half a tone lower). This concerned all people with absolute hearing, which is the ability to recognize a musical tone without the need to hear a reference tone. We have measured spontaneous otoacoustic emissions (SOAEs) in three subjects, while using carbamazepine compared to while not using carbamazepine. SOAEs are sounds generated in the inner ear. In all cases, a clear increase in the pitch of the SOAEs was found. The underlying mechanism is probably an increase in the stiffness of structures in the inner ear. This might also be the reason for the change in pitch perception, as reported in people with absolute hearing.

Curriculum vitae

Emile de Kleine studied Applied Physics at the University of Twente. He conducted his PhD research within the department of Ear, Nose and Throat (ENT) surgery of the University of Groningen. The study included so-called otoacoustic emissions central (i.e. sounds coming from the ear), especially in relation to Méniere's disease. During the final phase of his PhD research he was hired to train as a clinical physicist in audiology. Since 2004, he works as a clinical physicist-audiologist at the department of ENT of the University Medical Center Groningen. His areas of interest are cochlear implantation and tinnitus. In the field of tinnitus, the Groningen research group performs a leading role with many international publications.

Prof. dr. ir. D. Baskent

Music therapy for medical rehabilitation in audiology

Music is a universal language, a pleasurable experience for all humans, and an effective way of communicating emotions. Music can make one instantly happy or melancholic, and can bring back many memories. Music can also be a great tool for rehabilitation in health care. In audiology, the effects of hearing loss can be reduced with use of hearing aids or cochlear implants, and also with speech communication training tools. Recently, we have also been exploring music therapy and music training for rehabilitation in audiology. Some research has shown music training can make not only music perception better, but also emotion perception, and maybe even speech perception. Yet, this finding is not easily replicable. On the other hand, music training may simply provide a pleasurable training experience for listening in general. As a result of mixed findings, some rehabilitation centers are entirely enthusiastic about music training in audiology, while others are more skeptical. In this lecture, I will present relevant literature and our own work on music therapy and training in audiology while discussing such important clinical care questions.

Curriculum vitae

Deniz Baskent studied Electrical and Electronics Engineering at the Bilkent University in Ankara. She conducted her PhD research within the department of Biomedical Engineering at the Southern California University in Los Angeles. The study was focused on speech recognition under conditions of frequency-place compression and expansion. After completing her PhD, she worked as a Research Scientist at the Starkey Hearing Research Center in Berkeley. In 2011 she became an associate professor at the University Medical Center Groningen. At the moment she is a Professor of Auditory Perception at the University of Groningen with an expertise in auditory and speech perception with hearing-impaired listeners and users of auditory prostheses.

S.J. van Tuinen-Pyott

Development of new pharmaceutical strategies to prevent and treat hearing disorders

In her talk, van Sonja van Tuinen-Pyott will share new insights into the pathophysiology of hearing loss and how these insights are being used to develop new pharmaceutical strategies to prevent and treat hearing disorders.

Curriculum vitae

Sonja van Tuinen-Pyott is an Associate Professor in the Department of Otorhinolaryngology at the University Medical Center Groningen and University of Groningen. She received her BSc in Biochemistry and Molecular Biology from Penn State University (USA) and her PhD in Neuroscience from Stanford University (USA). She was also a Fulbright Scholar and Max Planck Fellow in the Department of Membrane Biophysics at the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany.

Van Tuinen-Pyott's research focuses on the fundamental biology of sensory transduction in the inner ear, the pathophysiology underlying hearing and balance disorders, and the consequences of hearing and balance disorders on health and wellbeing. Her research aims to achieve this goal. She uses an interdisciplinary toolkit that leverages physiological, imaging, transcriptomic, genomic, and comparative and evolutionary approaches to investigate the auditory and vestibular pathways in animal models.

Prof. dr. P. van Dijk

The relation between tinnitus and brain fuction, an overview of (f)-MRI studies

Tinnitus is a very common and potentially devastating condition. Several lines of evidence suggest that it may originate from adaptation of the brain to pathology of the inner ear. In this presentation, I will consider the characteristics of brain function and structure that relate to the presence of tinnitus. Together these suggest that the brain shows extensive adaptations to sensorineural hearing loss (inner ear hearing loss). However, in the case of tinnitus, the adaptations appear incomplete. Thus, future treatments for tinnitus may have to promote brain plasticity in order to achieve full adaptation to sensorineural hearing loss.

Curriculum vitae

Pim van Dijk studied Physics at the University of Groningen. Afterwards, he conducted a PhD research in the field of Physics and Biophysics of hearing at the University of Groningen. He was a researcher and audiology trainee at the department of Otorhinolaryngology in Groningen and Maastricht. Since 2004, prof. dr. van Dijk is a medicinal physicist, audiologist and Professor of Audiology in the department of Otorhinolaryngology at the UMCG. He also holds a position as visiting scientist in multiple departments and multiple universities. Additionally, he is a member of the Editorial Board of Hearing Research, board member of the Huizinga Foundation, and coordinator of TIN-ACT.

Dr. M. van den Berge

Auditory Brainstem Implant (ABI) as an implant for hearing improvement.

Sometimes tinnitus is the result of a blood vessel pressing on the auditory nerve. Doctors can identify this by means of an MRI scan, and a so-called decompression operation can remedy this. For people with tinnitus, however, this operation often turns out to be unsuccessful, Van den Berge researched. For patients who had dizziness symptoms in addition to the tinnitus, the operation was more often successful. However, the research shows that not all compressions also give symptoms. This makes it difficult to assess whether the tinnitus is the result of a conflict of the blood vessel and auditory nerve.
In addition, Van den Berge also looked at a form of neurostimulation in which the auditory nerve was directly stimulated with a ring electrode, as a possible treatment for tinnitus. This turned out not to be a suitable treatment because damage to the hearing occurred after the operation. That is why Van den Berge also investigated a pilot with an auditory brainstem implant (ABI), an implant that is originally intended for hearing improvement and that you place on the brain stem with surgery. The first preliminary results show that such an implant indeed reduces tinnitus without affecting hearing.

Curriculum vitae

Dr. M.J.C. (Minke) van den Berge-Gorter (1989) studied Medicine at the University of Groningen. During her PhD research, she was affiliated with the Department of Ear, Nose and Throat (ENT) Surgery of the University Medical Center Groningen (UMCG). She is now working as an ENT doctor in training from the UMCG and will complete her training in March 2023.

In 2020, she obtained her PhD on the topic “Neurosurgical interventions at the cochlear nerve & nucleus for treatment of tinnitus”. Patients with tinnitus, also called ringing in the ears, hear a sound for which there is no external source. There is no cure and, therefore, this condition can seriously affect the quality of life. In addition, not all treatments are suitable for all patients with tinnitus. In this thesis, Van den Berge investigates various neurosurgical treatment options for patients with severe tinnitus.

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