

# program

SEPTEMBER 19-22, 2012  
MÖVENPICK CONFERENCE CENTER  
AMSTERDAM



7TH  
INTERNATIONAL  
SYMPOSIUM

on objective  
measures  
in auditory  
implants

# saturday september 22<sup>nd</sup> 2012

LOCATION: MAINDECK PTA (PASSENGER TERMINAL AMSTERDAM)

AND ZURICH I + II

**08.30 - 09.00** keynote speaker: *Paddy French*  
Next generation sensors and  
actuators in Medicine

**location** Maindeck PTA

**09.00 - 10.30** plenary session 5  
Objective measures and future  
technologies

**location** Maindeck PTA

**moderators** David McAlpine and Jef Mulder

- Advances in integrity testing for Nucleus implants – *Britta Böhnke, Kiel* (Sat001)
- Intra-operative techniques for the measurement of residual hearing during cochlear implant surgery – *Halit Sanli, New Port* (Sat002)
- Infrared stimulation of the cochlear nucleus: implications for the ABI – *Rohit Verma, Boston* (Sat003)
- Estimating neural threshold without artefact subtraction from the linearity of the eCAP recording – *Robert Morse, Birmingham* (Sat004)
- An additive instantaneously companding readout system for cochlear implants – *Cees Jeroen Bes, Delft* (Sat005)
- Comparison of ECAP measurements using traditional and novel equipment – *George Tavartkiladze, Moscow* (Sat006)

**10.30 - 11.30** Coffee break & poster session group 2

**11.30 - 12.30** parallel session 7a  
Objective evaluations

**location** Maindeck PTA

**moderators** Bram van Dun and Wim Soede

- Detecting and avoiding cochlear implant artifacts in cortical auditory evoked potential recordings – *Bram van Dun, Chatswood* (Sat007)
- Electrically-Evoked Auditory Change Complex in children with Auditory Neuropathy Spectrum Disorder – *Shuman He, Chapel Hill* (Sat008)
- Application of ASSR for evaluating the hearing preservation in cochlear implantations – *Sabine Haumann, Hannover* (Sat009)
- Cortical processing of changes in music and speech in children with cochlear implants; role of music – *Rivta Torppa, Helsinki* (Sat010)
- Cochlear implant artifact cancellation using a high bandwidth high sample rate approach – *Myles Mc Laughlin, Irvine* (Sat011)

## **Sat05. An additive instantaneously companding readout system for cochlear implants**

**CJ Bes**, WA Serdijn

TU Delft, DELFT, Netherlands

Major Cochlear Implant manufacturers have included the possibility of recording neural responses. However, the possibilities are severely restricted due to the occurrence of saturation in the single channel amplifier and analog to digital converter (ADC), and the relative high noise levels. This is most clearly illustrated by the fact that objective neural thresholds are mostly found at the upper end of the subjective electrical dynamic range (Hughes, Brown, Lopez and Abbas, 1999). Recording on these relative high levels has as major drawback that different neural waveforms originating from different fibre populations are combined (Briaire and Frijns, 2005). Potentially the neural response data, thresholds, but also the spread of excitation and neural recovery functions, could provide insight in what the optimal stimulation strategy should be, and how to program the current levels of the implant for individual patients. Especially in very young children this should lead to increased performance. Researchers are now confronted with the limitations of existing neural response readout systems needed for reading out the evoked compound action potential (eCAP). These limitations urge the need for a new neural response readout system having a dynamic range of 126dB, that is small, low noise, power efficient and can handle input signals exceeding the supply voltage. Existing techniques do not offer solutions to meet the above specifications. An overall readout system design is proposed containing an additive instantaneous companding input system, multiplexer, compensation circuit, amplifier and an ADC in order to record the eCAPs from the stimulated auditory nerve.