

Research Annual Report 2007



Helmholtz Research School (HRS)

Audiology and speech, voice and language pathology

Plasticity and dynamics of sensori-motor systems



EMC HRS-01-62-01 - Audiology and speech, voice and language pathology

Programme design in brief

Research Questions

- I. Early detection of hearing impairment.
 - a. Follow-up of children that failed the newly introduced universal neonatal screening.
 - b. Testing children with auditory processing difficulties by comparing physiological tests (long-latency auditory evoked potential) with psychophysical tests.
- II. Diagnostic procedures
 - a. Development of a clinically acceptable test of spectral resolution to fine-tune hearing aids of patients.
 - b. Speech prediction from pure-tone audiogram. We calculate the speech audiogram from the pure-tone audiogram using the SII approach and a SII-words core transform established earlier. Diagnostic and rehabilitative procedures are assessed.
- III. Procedures for hearing aid fitting
 - a. The research focuses on the competence of the hearing aid dispenser in his new task in the triage of the patients, the required training to be able to perform these tasks and the cost-effectiveness of a deregulated system.
 - b. In a European project (HEARCOM) a system is developed to classify the hearing capacity of people with hearing complaints and to classify the environment in relevant terms (Speech quality, reverberation, background noises). The basic concept is to have all tests and material available on the internet. Next we are developing a website both for patients and professionals.
 - c. Hearing loss and hearing-aid fittings in people with learning disabilities were assessed
- IV. Technical improvement in hearing aids
 - d. Improvement of hearing-aid algorithms. An algorithm to improve speech intelligibility in noise in cochlear implant users was developed and evaluated.
 - e. An array microphone system developed by TU-Delft and marketed by Varibel is being assessed
- V. Stuttering in pre-school children. The cost-effectiveness of the emands-and-Capacities-Model based treatment (the Dutch standard treatment) compared to the Lidcombe-Programme (the Australian standard treatment): a randomized trial.
- VI. Traditionally, voice quality is judged perceptively, but acoustic measures are more objective. Therefore the "Dysphonia Severity Index" (DSI) was constructed, using four different objective (acoustic) measures. However, the applicability of the DSI still needs to be examined. To be able to offer optimal therapy to particular groups of patients, it is very important to carefully compare the effects of different treatment strategies.
- VII. Is the phonologic and speech motor development in ex-premature children different from children born a-term?

Key figures

Department	SP1	SP2	SP3	SP4	SPtot	T1	T2	T3	Ttot	IS	FS	OP	Ptot
otorhinolaryngology	1,24	0	1	0	2,24								
Total	1,24	0	1	0	2,24	1	0	0	1	5	0	0	6

Theses

Looij, M.A.J. van (2007, september 26). Hearing loss in HDR syndrome. EUR. Prom./coprom.: Prof.Dr. C.I. de Zeeuw, Prof.Dr. L. Feenstra & Dr. G.A. van Zanten.

Article/Letter to the editor

Bogaardt, HCA, Hakkesteegt, M.M., Grolman, W & Lindeboom, R (2007). Validation of the Voice Handicap Index using Rasch analysis. *Journal of Voice*, 21(3), 337-344.

Mondria, T., Gier, H.H.W. de & Boon, A.J.W. (2007). New device to control combined lingual and palatal myoclonus. *Movement Disorders*, 22(4), 573-576.

Speleman, L., Kerrebijn, J.D.F., Look, M.P., Meeuwis, C.A., Foekens, J.A. & Berns, P.M.J.J. (2007). Prognostic value of plasminogen activator inhibitor-1 in head and neck squamous cell carcinoma. *Head & Neck-Journal for the Sciences and Specialties of the Head and Neck*.

Tan, M.L. & Borst, J.G.G. (2007). Comparison of responses of neurons in the mouse inferior colliculus to current injections, tones of different durations, and sinusoidal amplitude-modulated tones. *Journal of Neurophysiology*, 98(1), 454-466.

Tan, M.L., Theeuwes, H.P., Feenstra, L. & Borst, J.G.G. (2007). Membrane properties and firing patterns of inferior colliculus neurons: An in vivo patch-clamp study in rodents. *Journal of Neurophysiology*, 98(1), 443-453.

EMC HRS-01-94-01 - Plasticity and dynamics of sensori-motor systems

Programme design in brief

The central theme of research at the Department of Neuroscience is "Plasticity and Dynamics of Sensori-Motor Systems". This central theme is investigated by 18 groups using a variety of technical approaches, including molecular biology, cell biology and physiology, neuroanatomy, systems electrophysiology, and behavioral and clinical studies. At the systems level the research topics of the individual groups focus on transduction mechanisms or motor learning. Of special interest are the interactions of visual, auditory, vestibular or proprioceptive sensory inputs with motor outputs such as the oculomotor system, locomotion, and hand and neck movements. At the cellular level the research topics center around the synaptic mechanisms underlying these dynamic and plastic processes.

Key figures

Department	SP1	SP2	SP3	SP4	S _{Ptot}	T1	T2	T3	T _{tot}	IS	FS	OP	P _{tot}
neurosciences	21,6	20,74	5,59	0	47,93								
pediatrics	0	0	0,5	0	0,5								
Total	21,6	20,74	6,09	0	48,43	4	1	0	5	48	6	9	68

Theses

Giessen, R.S. van der (2007, december 05). Role of electrotonic coupling in the olivocerebellar system. EUR. Prom./coprom.: Prof.Dr. C.I. de Zeeuw.

Hagen, A. van (2007, juni 20). Williams syndrome: from genes to clinical features. EUR. Prom./coprom.: Prof.Dr. C.I. de Zeeuw

Hojjati, M.R. (2007, november 14). Molecular and cellular mechanisms underlying spatial learning. EUR. Prom./coprom.: Prof.Dr. C.I. de Zeeuw.

Looij, M.A.J. van (2007, september 26). Hearing loss in HDR syndrome. EUR. Prom./coprom.: Prof.Dr. C.I. de Zeeuw, Prof.Dr. L. Feenstra & Dr. G.A. van Zanten.

Pijpers, W.C.T.M. (2007, januari 10). Functional anatomy of the intermediate cerebellum in the rat. EUR. Prom./coprom.: Prof.Dr. C.I. de Zeeuw.

Article/Letter to the editor

Andresescu, C.E., Milojkovic, B., Haasdijk, E.D., Kramer, P., Jong, F.H. de, Krust, A., Zeeuw, C.I. de & Jeu, M.T.G. de (2007). Estradiol improves cerebellar memory formation by activating ER? *Journal of Neuroscience*, 27(40), 10832-10839.

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Part of book - abstract

Helmerhorst, T.J.M., Wijnen, J.A. & Stoeckart, R. (2007). Embryologie en anatomie. In W.I. van der Meijden & W.A. ter Harnsel (Eds.), *Vulvopathologie* (pp. 3-11). Utrecht: Van Gorcum.

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