Annual Status Report 2011

Neurobiology Research Unit
Rigshospitalet and University of Copenhagen

Dept. Neurology, Neuroscience Centre
Rigshospitalet
Faculty of Health Sciences
Copenhagen University

www.nru.dk

Table of Contents

1. Research Facilities

Since June 1996 the Neurobiology Research Unit has been located at Juliane Maries Vej 24 in an old villa named Building 92 at the Rigshospitalet campus. In this house, NRU has offices and facilities for data analysis; with approx. 500 square meters, 20 offices and a conference room with kitchen.

The SPECT laboratory of NRU is located at the Department of Neurology on the 8th floor in the main complex of Rigshospitalet. The laboratory includes a room for the Philips IRIX SPECT scanner, a type B approved isotope laboratory, and a small office. Further office and laboratory facilities are shared with other employees at the department.

The NRU experimental laboratory resides at the ground floor in Building 93, Juliane Maries Vej 20, just opposite Building 92. Four laboratory rooms (in total 132.5 m^2) are allocated for NRU, and it shares another three rooms and two offices with the other research groups in the building.

NRU conducts its PET research activities in close collaboration with the PET- and Cyclotron Unit at the Department of Clinical Physiology/Nuclear Medicine, and has access to the PET and MR-PET scanners in the Finsen Building at Rigshospitalet. NRU has a close collaboration with radio-chemists and other key staff members at the PET- and Cyclotron Unit both in research and developmental activities.

2. Objectives, Organization, and Staff

NRU has its main interest within neurotransmission brain research, with particular focus on neuroreceptor imaging and molecular brain imaging. The unit is part of Center for Integrated Molecular Brain Imaging (Cimbi, www.cimbi.org) and is the main partner within Cimbi.

The research group is chaired by Professor, DMSc Gitte Moos Knudsen, Chief Engineer, PhD Claus Svarer is responsible for the data analysis section, and Adjunct Professor, DMSc Jens D. Mikkelsen for the basic neuroscience section. The Chief Technologist is Gerda Thomsen. Professor Olaf B. Paulson and associate Professor Steen G. Hasselbalch are members of the NRU leader group.

In 2011 the NRU staff consisted of:

Senior researchers and postdocs:
Susana Aznar, biologist, PhD
Anders Ettrup, human biologist, PhD
Ling Feng, engineer,
Patrick Fisher, MD, PhD
Vibe Frøkjær, MD, PhD
Steen Hasselbalch, MD, DMSc (half time)
Matthias Herth, chemist, PhD
Klaus Holst, biostatistician, PhD (half time)
Anders Bue Klein, human biologist, PhD
Gitte Moos Knudsen, professor, MD, DMSc
Karine Madsen, MD, PhD
Jens D. Mikkelsen, MD, PhD
Mikael Palner, engineer, PhD
Olaf B. Paulson, professor, MD, DMSc (part time)
Lars Pinborg, MD, DMSc (half time)
Morten Skøtt Thomsen, human biologist, PhD
Claus Svarer, chief engineer, PhD
Morten Ziebell, MD, PhD

PhD students:
Valdemar Lykke Andersen, pharmacologist
Agnete Bentsen, human biologist
Tina Bay, molecular biomedical scientist
Mona El-Sayed, human biologist
Mette Haahr, MD
Hanne D. Hansen, molecular biologist
Majbrit Myrup Jensen, human biologist
Cecilia Ratner, human biologist
Martin Santini, human biologist
Christian Gaden Jensen, psychologist

Graduate researchers:
Peter Steen Jensen, engineer, Center manager
Brenda McMahon, MD
Anna Pors Nielsen, MD
Dea Siggard Stenbæk, psychologist
Sophie da Cunha Bang, MD

Pregraduate students:
Angel Diego Cuñado Alonso, engineering
Anne-Sofie Bech Andersen, medical student
Mille D. Andersen, molecular biomedicine
Christian Arndt, medical student
Lasse Kofoed Bech, chemistry student
Kenda Christensen, medical student
Tina Christensen, human physiology
Betül Cinar, molecular biomedicine
Liv Hjordt Hansen, psychology
Julie Jacobsen. human biology
Christinna V., Jørgensen, molecular biomedicine
Sara Rubæk Jørgensen, molecular biomedicine
Zeenat Khan, medical technology
Nadia Maina Korfitsen, psychology
Sofie Lange, molecular biomedicine
Charlotte Lehmann, human biology
Maria Elena Klibo Lie, molecular biomedicine
Martin Korsbak Madsen, medical student
Eva Torstensen, medical student
Lene Ultved, , molecular biomedicine
Björg Vigfúsdottir, medical technology
Cathrine L. Wimmelmann, psychology

Technical and administrative personnel:
Ashraf Aalimi, engineerstudent, IT support
Dorte Frejwald Christiansen, research adm.
Agnete Dyssegaard, pharmacist
Lone Freyr, nurse
Dorthe Givard, research administrator
Dainius Griguzauskas, engineer student
Christine B. Janssens, medical technologist
Hans Jørgen Jensen, medical technologist
Helle Marijnissen, research administrator
Kenneth Nielsen, IT support
Svitlana Olsen, medical technologist
Mikkel Lohmann Schiøth, pharmacy student
Rasmus Sichlau, research assistant
Glenna Skouboe, medical technologist
Mikkel Søllbeck, pharmacy student
Gerda Thomsen, chief technologist
Paul Weisbjerg, pharmacy student

3. Collaborators in 2011

Center for Integrated Molecular Brain Imaging, Cimbi

www.cimbi.org

Cimbi consists of a multidisciplinary collaboration among institutes and departments in the Copenhagen area. These institutions include:

Neurobiology Research Unit, Rigshospitalet
The PET and Cyclotron Unit, Rigshospitalet
Department of Medicinal Chemistry, The Faculty of Pharmaceutical Sciences, University of Copenhagen
Danish Research Center for Magnetic Resonance, Hvidovre Hospital
Informatics and Mathematical Modelling, Technical University of Denmark
Department of Psychology, University of Copenhagen
Department of Medical Biochemistry & Genetics (IMBG), University of Copenhagen
Department of Health Psychology, University of Copenhagen

COGNITO, Novel treatments for cognitive dysfunction

Cognito is a newly established research project supported by the Strategic Research Council over the next 5 years. NRU is coordinating the project that also involves a number of institutions in Denmark and abroad.

Partners:
LIFE,Department of Basic Animal and Veterinary Sciences,Faculty of Life Sciences,University of Copenhagen
Department of Health Science and Technology University of Aalborg Laboratory of Neurobiology
Center for Applied Human Molecular Genetics, The Kennedy Center, Glostrup
Danish Dementia Research Center, Copenhagen University Hospital
Center for Neuropsychiatric Schizophrenia Research Ndr. Ringvej DK-2600 Glostrup
NeuroSearch NeuroSearch A/S Pederstrupvej 93 2750 Ballerup

The project is aimed to understand cognitive processes in the brain, and both animal and human studies are conducted. The project will in particular investigate the role of the alpha7 nicotinic receptor

EU 7th Framework Programmes

Marie Curie Intra European Fellowship (PIEF-GA-2010-275329) granted to Matthias Herth, PhD.
Development of New PET Radiotracers for In Vivo 5-HT2A and 5-HT7 Brain Imaging" Acronym: 5-HT Radiotracers

EURIPIDES - European Research initiative to develop Imaging Probes for early In-vivo Diagnosis and Evaluation of Response to Therapeutic Substances is a four year, 7 million project, funded by the European Union under European Framework Programme 7 (FP7). Co-ordinated by Dr. Matthias Koepp from the Institute of Neurology at University College London, the project aims to develop new radiotracers for imaging of the P-glycoprotein (P-gp) transporter using PET and validating current PET tracers in patients with suspected over-expression of P-gp function, contributing to drug resistance.
It is hoped that the study will provide both functional evidence in support of the transporter hypothesis of drug resistance, and a potential tool for the prediction of transporter-mediated resistance in patients with major neurological or neurodegenerative conditions as well as patients with tumours.

European Network of Excellence for Brain Imaging under the umbrella of the EANM
SPECT Centres from Italy, Germany, Belgium, Netherlands, Austria, Denmark, United Kingdom, France and Spain.

Companies

EGIS, Budapest, Hungary
Eli Lilly, UK
Glaxo SmithKline Beecham, London, UK
H. Lundbeck A/S
MAP Medical, Helsinki, Finland
NeuroSearch A/S
Philips Medical Systems

4. Awards and Publications

Awards

Vibe Gedsø Frøkjær is granted the L'Oréal Danmark award for women in science 26th January 2011
http://www.rigshospitalet.dk/topmenu/Nyheder+og+presse/Nyheder+fra+Rigshospitalet/Laege+phd+Vibe+Gedsoe+Froekjaer+har+modtaget+legatet+For+Kvinder+i+Naturvidenskab.htm

Patrick M. Fisher is granted the 24. ECNP Fellowship Award 3-7 September, Paris, France
http://www.ecnp.eu/en/awards/ECNP-fellowship-award/winners-fellowship-awards/Winners%202011.aspx

Gitte Moos Knudsen is granted Lassenprisen Wednesday the 7th December 2011 at Bispebjerg Hospital.
http://www.rigshospitalet.dk/topmenu/Nyheder+og+presse/Nyheder+fra+Rigshospitalet/Gitte+Moos+Knudsen+modtager+af+Niels+A+Lassen+prisen.htm

Professor at Harvard Medical School Bruce Rosen is granted the KFJ-prisen 16.12.2011
http://www.rigshospitalet.dk/topmenu/Nyheder+og+presse/Nyheder+fra+Rigshospitalet/Bruce+R+Rosen+professor+ved+Harvard+Medical+School+modtager+Rigshospitalets+Internationale+KFJ+pris.htm

Doctoral and PhD theses

Madsen K. PET Imaging of Cerebral Serotonin 4 Receptors in Relation to Sex, Aging and Alzheimer's Disease. København: Eget forlag 2011:1-54. Forsvaret d. 4.4.2011 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Palner M. Development & Evaluation of Monoaminergic Agonist PET Tracers. København:Eget forlag 2011:1-93. Forsvaret d. 11. marts 2011 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Ziebell M. Evaluation of the Superselective Radioligand [123I]PE2I for Imaging of the Dopamine Transporter in SPECT. København:Eget forlag 2011:1-106. Forsvaret d. 18. marts 2011 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Lisbeth Marner, Communication Among Neurons. Quantitative Measures in Aging and Disease. Disputats, København: Eget forlag 2011: 1-84. Forsvaret d. 16. September 2011 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Master theses

Dea Siggaard Stenbæk: The psychology of Obesity (Supervisor Steen Hasselbalch)

Sofie Lange: Pharmacological Effects of α7 Nicotinic Acetylcholine Receptor Activation on Neuronal Signalling (supervisor Jens D. Mikkelsen)

Angel Diego Cuñado Alonso: Improvement of MRI Brain Segmentation. (Supervisor Claus Svarer)

Internship

Liv Hjordt Hansen (Supervisor Dea Siggaard Stenbæk)

Cathrine L. Wimmelmann (Supervisor Dea Siggaard Stenbæk)

Peer-Reviewed Full-Length Publications

1. Aznar S, Knudsen GM. Depression and Alzheimer's Disease: Is stress the initiating factor in a common neuropathological cascade? J Alzheimers Dis. 2011;23(2):177-93.
2. Ansel L, Bentsen AH, Ancel C, Bolborea M, Klosen P, Mikkelsen JD, Simonneaux V. Peripheral kisspeptin reverses short photoperiod-induced gonadal regression in Syrian hamsters by promoting GNRH release. Reproduction. 2011;142(3):417-25
3. Castellano JM, Bentsen AH, Sánchez-Garrido MA, Ruiz-Pino F, Romero M, Garcia-Galiano D, Aguilar E, Pinilla L, Diéguez C, Mikkelsen JD, Tena-Sempere M. Early metabolic programming of puberty onset: impact of changes in postnatal feeding and rearing conditions on the timing of puberty and development of the hypothalamic kisspeptin system. Endocrinology. 2011;152(9):3396-408.
4. El-Sayed M, Hofman-Bang J, Mikkelsen JD. Effect of brain derived neurotrophic factor on activity regulated cytoskeleton associated protein gene expression in primary frontal cortical neurons. Comparison with NMDA and AMPA. Eur J Pharmacol. 2011; 25;660(2-3):351-7.
5. Erritzoe D, Frokjaer VG, Holst KK, Christoffersen M, Johansen SS, Svarer C, Madsen J, Rasmussen PM, Ramsøy T, Jernigan TL, Knudsen GM. In Vivo Imaging of Cerebral Serotonin Transporter and Serotonin2A Receptor Binding in 3,4-Methylenedioxymethamphetamine (MDMA or "Ecstasy") and Hallucinogen Users. Arch Gen Psychiatry. 2011;68(6):562-76.
6. Ettrup A, Kornum B, Weikop P, Knudsen GM. An approach for serotonin depletion in pigs: Effects on serotonin receptor binding. Synapse 2011;65(2):136-45
7. Ettrup A, Hansen M, Santini MA, Paine J, Gillings N, Palner M, Lehel S, Herth MM, Madsen J, Kristensen J, Begtrup M, Knudsen GM. Radiosynthesis and in vivo evaluation of a series of substituted (11)C-phenethylamines as 5-HT (2A) agonist PET tracers. Eur J Nucl Med Mol Imaging. 2011;38(4):681-93.
8. Ettrup A, Mikkelsen JD, Lehel S, Madsen J, Nielsen EO, Timmermann DB, Peters D and KnudsenGM; [11C]NS14492 as a novel PET radioligand for imaging cerebral α7 nicotinic acetylcholine receptors: in vivo evaluation and drug occupancy measurements. J Nucl Med. 2011;52(9):1449-56.
9. Jennings KA, Licht CL, Bruce A, Lesch KP, Knudsen GM, Sharp T. Genetic variation in 5-hydroxytryptamine transporter expression causes adaptive changes in 5-HT4 receptor levels. The International Journal of Neuropsychopharmacology 2011;16:1-9.
10. Jensen MM, Lange SC, Thomsen MS, Hansen HH, Mikkelsen JD. The Pharmacological Effect of KCNQ (Kv7) Positive Modulators on Dopamine Release from Striatal Slices. Basic Clin Pharmacol Toxicol. 2011:339-42.
11. Jensen PS, Thomsen G, Ziebell M, deNijs, R, Svarer C, Malik U, Skouboe G, Knudsen GM. Validation of a Method for Accurate and Highly Reproducible Quantification of Brain Dopamine Transporter SPECT Studies. J. Nuclear Medicine and Technology2011;39(4):271-8.
12. Klein AB, Williamson R, Santini MA, Clemmensen C, Ettrup A, Rios M, Knudsen GM, Aznar S. Blood BDNF concentrations reflect brain tissue BDNF levels across species. Int J Neuropsychopharmacol. (2011), 14, 347–353.
13. Kornum BR, Knudsen GM. Cognitive testing of pigs pigs (Sus scrofa) in translational biobehavioral research. Neurosci Biobehav Rev 2011;35(3):437-51

14. Kupers R, Frokjaer V, Erritzoe D, Naert A, Budtz-Joergensen E, Nielsen FA, Kehlet H, Knudsen GM. Serotonin transporter binding in the hypothalamus correlates negatively with tonic heat pain ratings in healthy subjects: a [11C]DASB PET study. Neuroimage 2011;54(2):1336-43

15. Liu X, Cannon DM, Akula N, Moya PR, Knudsen GM, Arentzen TE, Steele J, Laje G, Drevets WC, McMahon FJ. A non-synonymous polymorphism in galactose mutarotase (GALM) is associated with serotonin transporter binding potential in the human thalamus: results of a genome-wide association study. Molecular Psychiatry 2011; 16, 584–5

16. Lou AR, Madsen KH, Paulson OB, Julian HO, Prause JU, Siebner HR, Kjaer TW. Monocular Visual Deprivation Suppresses Excitability in Adult Human Visual Cortex. Cereb Cortex. 2011:2876-82.

17. Madsen J, Elfving B, Frøkjær VG, Kornum BR, Thomsen G, Martiny L, Knudsen GM. Synthesis and Biological Evaluation of 125I/123I-Labelled Analogues of Citalopram and Escitalopram as Potential Radioligands for Imaging of the Serotonin Transporter. J. Label Compd. Radiopharm 2011, 54 185–190

18. Madsen K, Haahr M, Marner L, Keller SH, Baaré W, Svarer C, Hasselbalch SG, Knudsen GM. Age and Sex Effects on 5-HT(4) Receptors in the Human Brain – A [11C]SB207145 PET Study. Journal of Cerebral Blood Flow & Metabolism 2011;31(6):1475-81

19. Madsen K, Erritzoe D, Mortensen EL, Gade A, Madsen J, Baaré W, Knudsen GM, Hasselbalch SG. Cognitive Function is Related to Fronto-striatal Serotonin Transporter Levels - A Brain PET Study in Young Healthy Subjects. Psychopharmacology (Berl). 2011;213(2-3):573-81.

20. Madsen K, Neumann WJ, Holst K, Marner L, Haarh MT, Lehel S, Knudsen GM, Hasselbalch SG. Cerebral Serotonin 4 receptors and Amyloid-β in Early Alzheimer's Disease. J Alzheimers Dis. 2011; 1;26(3):457-66

21. Madsen K, Marner L, Haahr M, Gillings N, Knudsen GM. Mass Dose Effects and In Vivo Affinity in Brain PET Receptor Studies – A Study of Cerebral 5-HT4 Receptor Binding with [11C]SB207145. Nuclear medicine and biology 2011;38(8):1085-91

22. Marner L, Knudsen GM, Madsen K, Holm S, Baaré W, Hasselbalch SG. The reduction of Baseline Serotonin 2A Receptors in Mild Cognitive Impairment is stable at Two-year Follow-up. J Alzheimers Dis. 2011;23(3):453-9.

23. Palner M, Underwood MD, Kumar DJ, Arango V, Knudsen GM, Mann JJ, Parsey RV. Ex vivo evaluation of the serotonin 1A receptor partial agonist [(3)H]CUMI-101 in awake rats. Synapse. 2011;65(8):715-23

24. Palner M, Kjaerby C, Knudsen GM, Cummings P. Effects of unilateral 6-OHDA lesion on [3H]NPA binding in striatum ex vivo, and vulnerability to amphetamine-evoked dopamine release in rat. Neurochemistry International 58 (2011) 243–247

25. Rasmussen H, Ebdrup BH, Erritzoe D, Aggernaes B, Oranje B, Kalbitzer J, Pinborg LH, Baaré WF, Svarer C, Lublin H, Knudsen GM, Glenthoj B. Serotonin2A receptor blockade and clinical effect in first-episode schizophrenia patients treated with quetiapine. Psychopharmacology (Berl). 2011;213(2-3):583-92.

26. Ryberg C, Rostrup E, Paulson OB, Barkhof F, Scheltens P, van Straaten EC, van der Flier WM, Fazekas F, Schmidt R, Ferro JM, Baezner H, Erkinjuntti T, Jokinen H, Wahlund LO, Poggesi A, Pantoni L, Inzitari D, Waldemar G. Corpus callosum atrophy as a predictor of age-related cognitive and motor impairment: A 3-year follow-up of the LADIS study cohort. J Neurol Sci. 2011 Aug 15;307(1-2):100-105

27. Salem LC, Hejl AM, Garde E, Leffers AM, Paulson OB, Waldemar G. White matter hyperintensities and prepulse inhibition in a mixed elderly population. Psychiatry Res. 2011 30;194(3):314-8

28. Santini MA, Klein AB, El-Sayed M, Ratner C, Knudsen GM, Mikkelsen JD, Aznar S. Novelty-induced activity-regulated cytoskeletal-associated protein (arc) expression in frontal cortex requires Serotonin 2A receptor activation. Neuroscience 2011, 8;190:251-7.

29. Söderman A, Mikkelsen JD, West MJ, Christensen DZ, Jensen MS. Activation of nicotinic α(7) acetylcholine receptor enhances long term potentation in wild type mice but not in APPswe/PS1ΔE9 mice. Neurosci Lett 2011;487(3):325-9

30. Thomsen MS, Weyn A, Mikkelsen JD, "Hippocampal α7 Nicotinic Acetylcholine Receptor Levels in Patients with Schizophrenia, Bipolar Disorder, or Major Depressive Disorder". Bipolar Disorders 2011;13(7-8):701-7
31. Thomsen MS, El-Sayed M, Mikkelsen JD. Differential immediate and sustained memory enhancing effects of alpha7 nicotinic receptor agonists and allosteric modulators in rats.PLoS One. 2011; 6(11) :e27014.
32. Vestergaard M, Madsen KS, Baaré WF, Skimminge A, Ejersbo LR, Ramsøy TZ, Gerlach C, Akeson P, Paulson OB, Jernigan TL. White Matter Microstructure in Superior Longitudinal Fasciculus Associated with Spatial Working Memory Performance in Children. J Cogn Neurosci. 2011;23(9):2135-46.
33. Williams WP 3rd, Jarjisian SG, Mikkelsen JD, Kriegsfeld LJ. Circadian control of kisspeptin and a gated GnRH response mediate the preovulatory luteinizing hormone surge. Endocrinology. 2011 Feb;152(2):595-606.
34. Ziebell M, Khalid U, Klein AB, Aznar S, Thomsen G, Jensen P, Knudsen GM. Striatal dopamine transporter binding correlates with serum BDNF levels in patients with striatal dopaminergic neurodegeneration. Neurobiol Aging 2011 428.e1-428.e5.

Textbooks and Reviews

Damsted SK, Born AP, Paulson OB, Uldall P. Exogenous glucocorticoids and adverse cerebral effects in children. Eur J Paediatr Neurol. 2011;15(6):465-77

Public dissemination, i.e., radio and TV interviews, newspaper articles

31.01.2012 Vibe Gedsø Frøkjær interview in the Danish tv program "Lounge" in connection to the L'Oréal Danmark award For women in science granted to Vibe on the 26th January 2011
http://www.tv2lorry.dk/artikel/37726?autoplay=1

Knudsen GM. Ecstasy and the cerebral serotonergic transmitter system - TV2 news 28.06.2011.

Jens D. Mikkelsen. An interview where Jens talked about how the internet has an impact on our thoughts and learning processes. This interview was used as promotion for the internet day. (http://www.internetdagen.dk/) where Jens was introductory speaker.

Jens D. Mikkelsen. Feature Article in Berlingske tidende 21/3-2011
http://www.b.dk/kronikker/dum-dummere-internet
Popular scientific communication of research through Danish radio and web-based media:

Anders Ettrup interview by Charlotte Price Persson, Journalist
16. oktober 2011 kl. 05:49.
http://videnskab.dk/krop-sundhed/gris-hjaelper-med-lose-hjerne-mysterium

Anders Ettrup on P1 - Danish radio channel:
Sundhed på P1 31. oktober 2011 kl. 11:03 på P1
http://www.dr.dk/P1/Sundhed/Udsendelser/2011/10/11144626.htm

Gitte Moos Knudsen interview: Seasonal defective disorder.
<http://schjoedt.ipapercms.dk/APPENSION/AP_PENSION_VINTERLIV/>

Jens D. Mikkelsen: COGNITO

http://ing.dk/artikel/124296-banebrydende-dansk-teknik-speeder-behandling-af-alzheimers-op

http://www.dr.dk/Nyheder/Indland/2011/11/23/202403.htm

http://www.dagensmedicin.dk/nyheder/kognitionsforskning-pa-rigshospitalet-far-179-mio/
http://www.rigshospitalet.dk/topmenu/Nyheder+og+presse/Nyheder+fra+Rigshospitalet/Rigshospitalet+faar+millionbevilling+til+kognitionsforskning.htm

Matthias Herth is given the Marie Curie grant 1st Juli 2011

http://www.regionh.dk/FIE/Topmenu/Nyheder/Arkiv_2011/2011-arkiv/EUfellowship_giver_tysk_postdoc_mulighed_for_karriereudvikling_i_Danmark.htm

Multicenter Studies without co-authorship

Jokinen H, Gouw AA, Madureira S, Ylikoski R, van Straaten EC, van der Flier WM, Barkhof F, Scheltens P, Fazekas F, Schmidt R, Verdelho A, Ferro JM, Pantoni L, Inzitari D, Erkinjuntti T; LADIS Study Group. Incident lacunes influence cognitive decline: the LADIS study. Neurology. 2011:1872-8.

5. Other Activities

5.1 Congress Participation

The staff members at NRU have participated in 26 international and national meetings and congresses related to their research fields. Staff members have participated as evaluators of abstracts and as chairmen at scientific sessions.

5.2 Congress/Symposium Organizing

Brain Awareness Week: 'Den moderne hjerne', 15.3.2011 kl .15.30-18.00, Rigshospitalet (in collaboration with Danish Society for neuroscience. Chairman: Gitte Moos Knudsen. Lectures: Jens D. Mikkelsen, Marianne Borritz, Kamilla Miskowiak og Claus Møldrup
NRU Summer Symposium, August 18th, 2011
NRU Christmas Symposium, December 9th

5.3 Pre- and Postgraduate Teaching

PhD course: Basic Kinetic Modeling in Molecular Imaging NRU 9201, 31.01.-04.02.2011

NRU organizes every other week seminars open to the public within the areas of NRU research interests. The meetings are announced on the homepage http://cimbi.dk/

Pregraduate Supervision:

Master's thesis in Molecular Biomedicine: Sofie Lange: Pharmacological Effects of α7 Nicotinic Acetylcholine Receptor Activation on Neuronal Signalling (supervisor Jens D. Mikkelsen)

Osval II: Christian Arndt: Sæsonvariationer i det serotonerge system - fokus på serotonin transporteren (supervisor Gitte Moos Knudsen)

Osval II: Morten Børre Nielsen: Feeding, reward and serotonin (supervisor Gitte Moos Knudsen)

Osval II: Valter Niemelä: Predicting Alzheimer Disease in cognitively normal individuals through high

Abeta levels in PIB-PET (supervisor: Steen G. Hasselbalch)

Osval I: Sandra Ásgeirsdóttir: Can changes in the serotonin system explain the cognitive symptoms in

Alzheimer's disease? (supervisor: Steen G. Hasselbalch)

Osval II: Eva Torstensen: Risk factors for development of cognitive impairment with remitted depression

(supervisor: Steen G. Hasselbalch)

Osval II: Kenda Christensen: Risikofaktorer for depression: spiller inflammation en rolle? (supervisor:

Steen G. Hasselbalch)

Bachelor project: Zeenat Khan and Björg Vigfúsdóttir: Implementation of an automated program for doses and specific activity calculation in PET. (Supervisors Claus Svarer, Ling Feng, Lars Pinborg).

Bachelor project: Frederik Federspiel 5-HTTLPR-polymorfiens funktionalitet samt effekt på kognition, aldersrelateret kognitiv tilbagegang og Alzheimers sygdom(supervisor Olaf B. Paulson)

Bachelor projekt: Stud med. Signe Boye Knudsen Antihypertensivas effekt i forebyggelsen af recidiv af apopleksi (supervisor Olaf B. Paulson)

5.4 International Exchange

Professor Gitte Moos Knudsen: Athinoula A. Martinos Center for Biomedical Imaging, Boston USA

PhD student Martin Santini: Molecular and Psychiatric Neuroscience Laboratory at McLean Hospital, Harvard Medical School, Boston, USA

PhD student Hanne Demant Hansen: Athinoula A. Martinos Center for Biomedical Imaging, Boston USA

PhD student Tina Bay: University of Basel, Department of Biomedicine, Institute of Physiology, Pharmazentrum, Basel, Schweiz at Prof. Bernhard Bettler.

5.5 National and International Committees

National Committees:

President of the Danish Society for Neuroscience (Gitte Moos Knudsen)

Chairman for the steering group for research laboratories at Rigshospitalet (Gitte Moos Knudsen)

Chairman for the Academy of Technical Science, Biology, Chemistry and Geology (Jens D. Mikkelsen)

Program committee member of the Strategic Research Council, Ministry of Science and Innovation (Gitte Moos Knudsen)

RH representative in the Danish Agency for Science, Technology and Innovation's EU 7th Framework Programme Committee (Gitte Moos Knudsen)

Chairman of the neuro-group regarding Neuropsychiatry Publications, Danish Agency for Science, Technology and Innovation (Gitte Moos Knudsen)

Vice Chairman, Department of Neurology, Psychiatry and Sensory Sciences, University of Copenhagen (Olaf B. Paulson)

Chairman of the Research Committee of the Neuroscience Centre at Rigshospitalet (Olaf B. Paulson)

Member of the Research Committee of Hvidovre Hospital (Olaf B. Paulson)

Member of the Committee, (Erhvervsforskerudvalget), Danish Agency for Science, Technology and Innovation (Jens D. Mikkelsen)

Member of the board of directors of the Elsass Foundation (Olaf B. Paulson)

Vice-chairman and member of the board of directors of the Danish Alzheimer Association (Steen Hasselbalch)

Member of the board of the Danish Society of Neurology (Lars H. Pinborg)

International Committees:

Member of the Executive Committee for the European Collegium of Neuropsychopharmacology (Gitte Moos Knudsen)

Member of the program committee for Training Courses at the Brain11 Meeting in Barcelona (Gitte Moos Knudsen).

Members of the Editorial Board of the Journal of Cerebral Blood Flow and Metabolism (Gitte Moos Knudsen and Steen Hasselbalch)

Evaluation:

Reviewer for Docentur in Molecular Neuroimaging at Karolinska Institutet (Gitte Moos Knudsen)

Evaluator for appointment as Distinguished Professor at the University of Pittsburgh (Gitte Moos Knudsen)

Reviewer for professor in neurology at Uppsala University (Gitte Moos Knudsen)

Reviewer for Austrian Science Fund (FWF) (Gitte Moos Knudsen)

Reviewer for Professor in Neural Engineering (Gitte Moos Knudsen) and Experimental Medicine (Jens D. Mikkelsen) at Aalborg University

Evaluator for the EU 7th framework programme (Jens D. Mikkelsen)

Evaluator for the Tryg Foundation (Olaf B. Paulson)

Reviewer for phd in Molecular Imaging at Manchester University (Claus Svarer)

External examiner at the Technical University of Denmark and Aalborg University (Claus Svarer),

External examiner at the Universities of Copenhagen, Århus and Odense (Jens D. Mikkelsen)

Finally, staff members of NRU regularly conduct peer-reviews for several international journals and at international congresses.

6. SPECT Laboratory

Clinical scans

A total of 385 clinical scans have been performed in 2011, Of these 107 were with the dopamine transporter ligand [^{123}I]-PE2I, the remaining with the blood flow tracer ^{99m}Tc-HMPAO.

The SPECT laboratory is the only laboratory in Denmark that conducts interictal and ictal scans as part of pre-surgical planning for epilepsy (29 double scans with ^{99m}Tc-HMPAO SISCOM)).

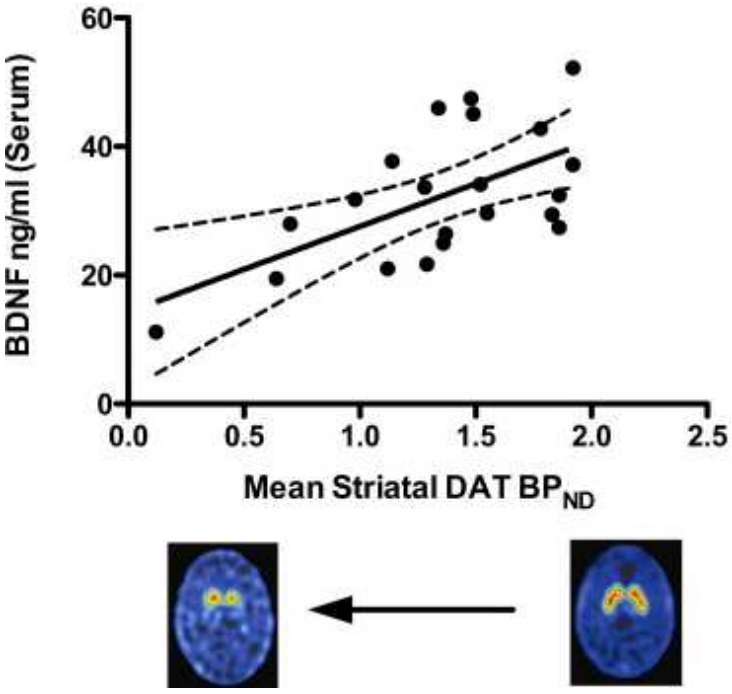
New clinical diagnostic tools 2011

Dopamine transporter (DAT) and [^{123}I]-PE2I described both visually and with semi-quantitative analysis correlated to age-matched healthy subjects database implementation completed January 2010 and in 2011 the semi-quantitative analysis was published as a paper *: Jensen PS, Thomsen G, Ziebell M, deNijs, R, Svarer C, Malik U, Skouboe G, Knudsen GM. Validation of a Method for Accurate and Highly Reproducible Quantification of Brain Dopamine Transporter SPECT Studies. J. Nuclear Medicine and Technology2011;39(4):271-8.*

Research projects carried out in 2011

- Smoking and striatal dopamine transporter availability in healthy volunteers using [^{123}I]FP-CIT (DaTSCAN) and SPECT.
- Body mass index and striatal dopamine transporter availability in healthy volunteers using SPECT and [123I]PE2I.
- ^{123}I-PE2I SPECT as a diagnostic tool in clinically uncertain parkinsonian syndromes
- [^{123}I]-PE2I SPECT in clinically uncertain parkinsonian syndromes and BDNF (see figure.1)
- [^{123}I]-PE2I SPECT and NPH

Figure 1



Ziebell M, Khalid U, Klein AB, Aznar S, Thomsen G, Jensen P, Knudsen GM. Striatal dopamine transporter binding correlates with serum BDNF levels in patients with striatal dopaminergic neurodegeneration. Neurobiol Aging 2011 428.e1-428.e5.

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