Annual Status Report 2009

Neurobiology Research Unit

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

www.nru.dk

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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; approx. 500 square meters, 19 offices and a conference room with kitchen facilities is allocated for NRU.

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 in Building 93, Juliane Maries Vej 20, just opposite Building 92. The ground floor of Building 93 is shared with the Cardiovascular Laboratory. Four laboratory rooms (in total 92.5 m^2) are allocated for NRU, and it shares another three rooms and two offices with the above mentioned research group.

NRU conducts its PET research activities in close collaboration with the Department of Clinical Physiology/Nuclear Medicine, and has access to the three PET scanners in the PET Unit in the Finsen Building at Rigshospitalet. NRU has a close collaboration with the Department of Clinical Physiology/Nuclear Medicine in the research planning 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).

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 and laboratory leader is PhD Susana Aznar.

In 2009 the research staff consisted of:

Senior Researchers:
Susana Aznar, Biologist, PhD
Ditte Z. Christensen, Human Biologist, PhD
David Erritzøe, MD, PhD
Vibe Frøkjær, MD, PhD
Steen Hasselbalch, MD, DMSc (half time)
Gitte Moos Knudsen, Professor, MD, DMSc
Cecilie Löe Licht, Human Biologist, PhD
Lisbeth Marner, MD, PhD
Jens Damsgaard Mikkelsen, MD, PhD
Finn Årup Nielsen, Engineer, PhD*
Lars Pinborg, MD, DMSc (half time)
Morten Skøtt Thomsen, Human Biologist, PhD
Olaf B. Paulson, Professor, MD, DMSc
Karam Sidaros, Engineer, PhD*
Claus Svarer, Engineer, PhD

PhD students:
Anders Ettrup, Human Biologist
Mette Haahr, MD
Jens Munk Hansen, Physicist
Jan Kalbitzer, MD
Anders Bue Klein, Human Biologist
Birgitte Rahbek Kornum, Human Biologist
Karine Madsen, MD
Robin de Nijs, Physicist*
Mikael Palner, Engineer
Morten Ziebell, MD

Junior Researchers:
Agnete Bentsen, Human Biologist*
Anetta Claussen, Engineer
Martin Santini, Human Biologist

Associated Researchers:
Klaus Holst, Biostatician

Students:
Tine Arentzen, biochemistry student
Christoffer Clemmensen, human biology student
Mona El-Sayed, human biology student
Signe Holm-Hansen, human biology student
Christian Gaden Jensen, psychology student
Maria Christina Mikkelsen, medical student
Majbrit Myrup Jensen, human biology student
Sofie Lange, molecular biomedical student
Cecilia Ratner, human biology student
Dea Siggaard Stenbæk, psychology student

Technical Administrative Personnel:
Astrid Beck, technologist student
Anita Dole, medical technologist
Sebastian Bonnesen, research assistant
Pia Farup, secretary
Lone Freyr, nurse
Dorthe Givard, secretary
Troels Kofoed Jacobsen, IT support
Jakob Janot, IT support
Christine B. Janssens, medical technologist
Hans Jørgen Jensen, medical technologist
Peter Jensen, Engineer
Jack Frausing Nielsen, medical technologist
Svitlana Olsen, medical technologist
Blerta Shuka, medical technologist
Rasmus Sichlau, research assistant
Glenna Skouboe, medical technologist
Gerda Thomsen, Chief technologist

* shared with another research group

Guest Researchers:
Julian Neumann, medical student, ERASMUS student, University of Berlin, Germany
Louise Paterson, Research Assistant, Psychopharmacology Unit, University of Bristol, UK
Hans Rasmussen, Psychologist, Glostrup Hospital
Sigurdur Sigurdsson, MD, Dept. of Nephrology, KAS Herlev
Ana del Mar Ruiz Munoz, University of Almeria, Spain

3. Collaborators in 2009

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:

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

EU 6th Framework Programme
DiMI - Diagnostic Molecular Imaging (LSHB-CT-2005-512146)
The goal of the Network of Excellence "Diagnostic Molecular Imaging" (DiMI) - Molecular Imaging for Diagnostic Purposes - is to integrate multidisciplinary research for the development of new probes and multimodal non-invasive imaging technology for early diagnosis, assessment of disease progression and treatment evaluation.
The general objectives of DiMI are to coordinate and efficiently integrate more than 50 research groups from various disciplines to study non-invasively gene expression and function in major diseases such as neurodegeneration, stroke, heart failure, atherosclerosis and autoimmune diseases.
For further information, please visit www.dimi-net.org.
NRU is training platform for image and data analyses for DiMI partners.

EU 7th Framework Programme
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.

Measuring Endogeneous Transmitter Release with PET-tracers (METPETS)
Neurotransmitters are mediating a large part of the communication between nerve cells in the brain, so a key goal of neuroscience is to identify the factors regulating this release. PET and SPECT techniques are currently the only way in which neurotransmitter release in the brain can be measured; this is well proven for one transmitter, dopamine, where studies have revealed important roles in addiction, schizophrenia, and depression. However, the challenges of developing such tracers are so immense that over the past decade there has been little progress with tracers for other transmitters despite the clear need. The best way to progress this critical area is to enable the major European imaging centres to act as an integrated network.

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

Others
Glaxo SmithKline Beecham, London, UK
H. Lundbeck A/S
Language Section, National Institutes of Health, Bethesda, Maryland, USA
Mannheim Central Mental Institute, University of Heidelberg
MAP Medical, Helsinki, Finland
NeuroSearch A/S
Philips Medical Systems

4. Publications

Doctoral and PhD theses

Erritzoe D. PhD-afhandling: In vivo serotonergic markers in overweight and schizophrenic human subjects. København: Eget forlag 2009:1-74. Forsvaret d. 17. april 2009 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Kalbitzer J. PhD-afhandling: The serotonin transporter and behavior: Gene environment interactions. København: Eget forlag 2009:1-120. Forsvaret d. 16. november 2009 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Kornum BR. PhD-afhandling: A pig model for studies of serotonergic mechanisms in memory disorders. København: Eget forlag 2009:1-70. Forsvaret d. 29. oktober 2009 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Licht CL. PhD-afhandling: Changes in the 5-HT4 receptor in animal models of depression and antidepressant treatment. København: Eget forlag 2009:1-61. Forsvaret d. 2. februar 2009 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Marner L. PhD-afhandling: Molecular brain imaging of the serotonin system: Reproducibility and evaluation of PET radiotracers. København: Eget forlag 2009:1-62. Forsvaret d. 13. marts 2009 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Pinborg LH. Disputats: Molecular imaging of receptors and transporters in humans using PET and SPECT: from models to methods and potentials to pitfalls. København: Eget forlag 2009:1-63. Forsvaret d. 4. juni 2009 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Rasmussen H. PhD-afhandling: Imaging serotonin 2A receptors in schizophrenia patients before and after first antipsychotic treatment. København: Eget forlag 2009:1-66. Forsvaret d. 18. september 2009 ved Københavns Universitet, Det Sundhedsvidenskabelige Fakultet.

Master thesis

Christoffer Clemmensen: Serotonin 2A receptor interaction with the microtubule-associated protein 1A. Implications for Alzheimer's disease (supervisor: Gitte Moos Knudsen and Susana Aznar)

Signe Holm-Hansen: Head-to-head comparison of DAT tracers for SPECT 123I-PE2I versus 123I-FP-CIT in healthy subjects and in patients with parkinsonism (supervisor: Gitte Moos Knudsen)

Peer-Reviewed Full-Length Publications

Bendova Z, Sumova A, Mikkelsen JD. Circadian and developmental regulation of n-methyl-d-aspartate-receptor 1 mRNA splice variants and n-methyl-d-aspartate-receptor 3 subunit expression within the rat suprachiasmatic nucleus. Neuroscience 2009;159:599-609.

Bundzikova J, Pirnik Z, Zelena D, Mikkelsen JD, Kiss A. Alpha2-adrenergic impact on hypothalamic magnocellular oxytocinergic neurons in long evans and brattleboro rats: effects of agonist and antagonists. Cell Mol Neurobiol 2009;29:1015-23.

Butini S, Gemma S, Campiani G, Franceschini S, Trotta F,Borriello M, Ceres N, Ros S, Coccone SS, Bernetti M, Angelis MD, Brindisi M, Nacci V, Fiorini I, Novellino E, Cagnotto A, Mennini T, Sandager-Nielsen K, Andreasen JT, Scheel-Krüger J, Mikkelsen JD, Fattorusso C. Discovery of a new class of potential multifunctional atypical antipsychotic agents targeting dopamine D3 and serotonin 5-HT1A and 5-HT2A receptors: Design, synthesis, and effects on behavior. J Med Chem 2009;52:151-169.

de Nijs R, Miranda MJ, Hansen LK, Hanson LG. Motion correction of single-voxel spectroscopy by independent component analysis applied to spectra from nonanesthetized pediatric subjects. Magn Reson Med 2009;62(5):1147-54.

Erritzoe D, Frøkjær V, Haugbøl S, Marner L, Svarer C, Holst K, Baare W, Rasmussen PM, Madsen J, Paulson OB, Knudsen GM. Brain serotonin 2A receptor binding: Relations to body mass index, tobacco and alcohol use. Neuroimage 2009;46:23-30.

Frøkjær V, Vinberg M, Erritzøe D, Svarer C, Baaré W, Budtz-Jørgensen E, Madsen K, Madsen J, Kessing LV, Knudsen GM. High familial risk for mood disorder is associated with low dorsolateral prefrontal cortex serotonin transporter binding. Neuroimage 2009;46:360-6.

Frøkjær VG, Erritzøe D, Madsen J, Paulson OB, Knudsen GM. Gender and the use of hormonal contraception in women are not associated with cerebral cortical serotonin 2A receptor binding. Neuroscience 2009;163:640-5.

Gerlach C. Category-specificity in visual object recognition. Cognition 2009;111:281-301.

Herth MM, Kramer V, Piel M, Palner M, Riss PJ, Knudsen GM, Rösch F. Synthesis and in vitro affinities of various MDL 100907 derivates as potential (18)F-radioligands for 5-HT(2A) receptor imaging with PET. Bioorg Med Chem 2009;17:2989-3002.

Jacobsen JP, Redrobe JP, Hansen HH, Petersen S, Bond CT, Adelman JP, Mikkelsen JD, Mirza NR. Selective cognitive deficits and reduced hippocampal brain-derived neurotrophic factor mRNA expression in small-conductance calcium-activated K+ channel deficient mice. Neuroscience 2009;163:73-81.

Kalbitzer J, Frokjaer VG, Erritzoe D, Svarer C, Cumming P, Nielsen FÅ, Hashemi SH, Baaré WF, Madsen J, Hasselbalch SG, Kringelbach ML, Mortensen EL, Knudsen GM. The personality trait openness is related to cerebral 5-HTT levels. Neuroimage 2009;45:280-5.

Kalbitzer J, Svarer C, Frokjaer VG, Erritzoe D, Baaré WF, Madsen J, Hasselbalch SG, Knudsen GM. A probabilistic approach to delineating functional brain regions. J Nucl Med Technology 2009;37:91-5.

Knorr U, Vinberg M, Klose M, Feldt-Rasmussen U, Hilsted L, Gade A, Haastrup E, Paulson OB, Wetterslev J, Gluud C, Gether U, Kessing L. Rationale and design of the participant, investigator, observer, and data-analyst-blinded randomized AGENDA trial on associations between gene-polymorphisms, endophenotypes for depression and antidepressive intervention: the effect of escitalopram versus placebo on the combined dexamethasone-corticotrophine releasing hormone test and other potential endophenotypes in healthy first-degree relatives of persons with depression. Trials 2009;10:66.

Knudsen GM. Testing for radioligand sensitivity to endogenous neurotransmitter release. Eur J Nucl Med Mol Imaging 2009;36:472-4.

Kornum BR, Lind NM, Gillings N, Marner L, Andersen F, Knuden GM. Evaluation of the novel 5-HT4 receptor PET ligand [11C]SB207145 in the Göttingen minipig. J Cereb Blood Flow Metab 2009;29:186-96.

Kupers R, Frokjaer VG, Naert A, Christensen R, Budtz-Joergensen E, Kehlet H, Knudsen GM. A PET [18F]altanserin study of 5-HT_{2A} receptor binding in the human brain and responses to painful heart stimulation. Neuroimage 2009;44:1001-7.

Kupers R, Schneider FCG, Christensen R, Naert A, Husted H, Paulson OB, Kehlet H. No evidence for generalized increased postoperative responsiveness to pain: A combined behavioral and serial functional magnetic resonance imaging study. Anesth Analg 2009;109:600-6.

Licht CL, Marcussen AB, Wegener G, Overstreet DH, Aznar S, Knudsen GM. The brain 5-HT4 receptor binding is downregulated in the Flinders Sensitive Line depression model and in response to paroxetine administration. J Neurochem 2009;109:1363-74.

Marner L, Gillings N, Comley RA, Baaré WFC, Rabiner EA, Wilson AA, Houlse S, Hasselbalch SG, Svarer C, Gunn RN, Laruelle M, Knudsen GM. Kinetic modelling of [11C]SB207145 binding to 5-HT4 receptors in the human brain in vivo. J Nucl Med 2009;50:900-8.

Marner L, Knudsen GM, Haugbøl S, Holm S, Baaré W, Hasselbalch SG. Longitudinal assessment of

cerebral 5-HT_{2A} receptors in healthy elderly volunteers: An [^{18}F]-altanserin PET study. Eur J Nucl Med Mol Imaging 2009;36:287-93.

Mikkelsen JD, Bentsen AH, Ansel L, Simonneaux V, Juul A. Comparison of the effects of peripherally administered kisspeptins. Regul Peptides 2009;152:95-100.

Mikkelsen JD, Simonneaux V. The neuroanatomy of the kisspeptin system in the mammalian brain. Peptides 2009;30:26-33.

Nielsen FA. Visualizing data mining results with the brede tools. Front Neuroinformatics 2009;3:26.1-12

Nielsen FA. Lost in localization: a solution with neuroinformatics 2.0?. Neuroimage 2009;48(1):11-3.

Nielsen TR, Kornum BR, Moustgaard A, Gade A, Lind NM, Knudsen GM. A novel spatial delayed non-match to sample (DNMS) task in the Göttingen minipig. Behav Brain Res 2009;196:93-8.

Ramsøy TZ, Liptrot MG, Skimminge A, Lund TE, Sidaros K, Christensen MS, Baaré W, Paulson OB, Jernigan TL. Regional activation of the human medial temporal lobe during intentional encoding of objects and positions. Neuroimage 2009;47:1863-72.

Revel FG, Masson-Pévet M, Pévet P, Mikkelsen JD, Simonneaux V. Melatonin controls seasonal breeding by a network of hypothalamic targets. Neuroendocrinology 2009;90(1):1-14.

Sidaros A, Skimminge A, Liptrot MG, Sidaros K, Engberg AaW, Herning M, Paulson OB, Jernigan TL, Rostrup E. Long-term global and regional brain volume changes following severe traumatic brain injury: A longitudinal study with clinical correlates. Neuroimage 2009;44:1-8.

Simonneaux V, Ansel L, Revel FG, Klosen P, Pévet P, Mikkelsen JD. Kisspeptin and the seasonal control of reproduction in hamsters. Peptides 2009:30:146-53.

Syvänen S, Lindhe Ö, Palner M, Kornum BR, Rahman O, Långström B, Knudsen GM, Hammarlund-Udenaes M. Species differences in blood-brain barrier transport of three PET radioligands with emphasis on P-glycoprotein transport. Drug Metab Dispos 2009;37:635-43.

Thomsen MS, Christensen DZ, Hansen HH, Redrobe J, Mikkelsen JD. Alpha7 nicotinic acetylcholine receptor activation prevents behavioral and molecular changes induced by repeated phencyclidine treatment. Neuropharmacology 2009:56:1001-9.

Trajkovska V, Kirkegaard L, Krey G, Marcussen AB, Thomsen MS, Chourbaji S, Brandwein C, Ridder S, Halldin C, Gass P, Knudsen GM, Aznar S. Activation of glucocorticoid receptors increases 5-HT2A receptor levels. Exp Neurol 2009;218:83-91.

Trajkovska V, Santini MA, Marcussen AB, Thomsen MS, Hansen HH, Mikkelsen JD, Arneberg L, Kokaia M, Knudsen GM, Aznar S. BDNF downregulates 5-HT2A receptor protein levels in hippocampal cultures. Neurochem Int 2009;55:697-702.

Vinberg M, Trajkovska V, Bennike B, Knorr U, Knudsen GM, Kessing LV. The BDNF Val66Met polymorphism: Relation to familiar risk of affective disorder, BDNF levels and salivary cortisol. Psychoneuroendocrinology 2009;34:1380-9.

Textbooks and Reviews

Gade A, Knudsen GM. Metaboliske, endokrine og andre systemiske sygdomme. In: Gade A, Gerlach C, Starrfelt R, Pedersen PM. Klinisk neuropsykologi. København: Frydenlund 2009:371-82.

Other (abstracts not included)

Knudsen GM. Personlighed kan læses i hjernen. Brunch TV2 11.03.2009 http://www.lorry.dk/moduler/nyheder/showregvideo.asp?dato=11-03-2009&cID=5&vId=473428

Marner L. Molekylær billeddannelse af hjernens serotoninsystem. BestPractice 2009:6-7

Paulson OB. Mogens Møller: Mogens Fog. Boganmeldelse. Ugeskr Laeger 2009

Jensen CG. Carsten Reidies Bjarkham: Neuroanatomi. Boganmeldelse. Indput 2009

Bolwig TG, Brennum J, Fink-Jensen A, Hasselbalch SG, Juhler M, Kjær T, Knudsen GM, Paulson OB. Forskere, der bidrog til Videnskabsteater-forestilling: Vis mig din hjerne, og jeg skal sige dig, hvem du er. Videnskabsteatret, København. Opført 11. marts og 14. april på Rigshospitalet samt 19. november 2009 på Panum Instituttet.

Multicenter Studies without co-authorship

Jokinen H, Kalska H, Ylikoski R, Madureira S, Verdelho A, van der Flier WM, Scheltens P, Barkhof F, Visser MC, Fazekas F, Schmidt R, O'Brien J, Waldemar G, Wallin A, Chabriat H, Pantoni L, Inzitari D, Erkinjuntti T; LADIS Study Group. Longitudinal cognitive decline in subcortical ischemic vascular disease - The Ladis study. Cerebrovasc Dis 2009;27:384-91.

Jokinen H, Kalska H, Ylikoski R, Madureira S, Verdelho A, Gouw A, Scheltens P, Barkhof F, Visser MC, Fazekas F, Schmidt R, O'Brien J, Hennerici M, Baezner H, Waldemar G, Wallin A, Chabriat H, Pantoni L, Inzitari D, Erkinjuntti T; LADIS Study Group. MRI-defined subcortical ischemic vascular disease: Baseline clinical and neuropsychological findings - The Ladis study. Cerebrovasc Dis 2009;27:336-44.

Benisty S, Gouw AA, Porcher R, Madureira S, Hernandez K, Poggesi A, van der Flier WM, Van Straaten ECW, Verdelho A, Ferro J, pantoni L, Inzitari D, Barkhof F, Fazekas F, Chabriat H: LADIS Study Group. Location of lacunar infarcts correlates with cognition in a sample of non-disabled subjects with age-related white-matter changes - The Ladis study. J Neurol Neurosurg Psychiatry 2009;80:478-83.

5. Other Activities

5.1 Congress Participation

The staff of NRU has participated in 30 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

METPETS (Measuring Endogenous Neurotransmitters by PET and SPECT) Consortium - Inaugural Meeting, June 2-3, 2009, Carlsberg Academy, Gamle Carlsberg Vej 15, Valby, Copenhagen. Organizer: Gitte Moos Knudsen.

The Science Theatre: 'Brain Research: Show me your brain and I shall tell you who you are', March 11 and April 14, 2009, at Rigshospitalet, Copenhagen. A one-day public symposium. Organizers: Susana Aznar and Olaf B. Paulson (contributing researchers: Bolwig TG, Brennum J, Fink-Jensen A, Hasselbalch SG, Juhler M, Kjær T, Knudsen GM, Paulson OB).

5.3 Pre- and Postgraduate Teaching

PhD course: Basic Kinetic Modeling in Molecular Imaging, Copenhagen, 12.-16.1.2009 (Gitte Moos Knudsen)

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://nru.dk/meetings/FIG.

On December 11, 2009, NRU organized an open-to-the-public one day symposium where scientists from NRU presented their most recent data.

Pregraduate Supervision:

Human Biology Project II: Mark Klitgaard Nøhr: The 5-hydroxytryptamine 7 receptor: characterization, activation and function (supervisor: Gitte Moos Knudsen)

5.4 International Exchange

PhD student Mikael Palner: PET-center, Colombia University, New York

Chief Engineer Claus Svarer: Laboratory of Neuro Imaging (LONI), University of California

5.5 National and International Committees

National Committees:

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)

President of the Danish Society of Neurology (Olaf B. Paulson)

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

Steering group member of the Danish Society for Neuroscience since 1997 (Gitte Moos Knudsen)

Chairman for the steering group for research laboratories at Rigshospitalet from 1999 (Gitte Moos Knudsen)

Member of the Steering Group for the Neurocluster, Health Science Faculty, since 2004 (Gitte Moos Knudsen)

RH representative committee member of Biologue since 2007 (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 since 2008 (Gitte Moos Knudsen)

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

Member of evaluation committee for professorship in neurosurgery at Aarhus University, Denmark (Olaf B. Paulson)

International Committees:

Member of the Editorial Board of the Journal of Cerebral Blood Flow and Metabolism from 2000 (Gitte Moos Knudsen)

Member of the Editorial Board of the Journal of Cerebral Blood Flow and Metabolism from 2009 (Steen Hasselbalch)

Member of the Steering Group for the Network of Excellence Diagnostic Molecular Imaging (DiMI) since 2005 (Gitte Moos Knudsen)

Scientific Advisory Board Member, Health Science Faculty, University of Lund since 2008 (Gitte Moos Knudsen)

Scientific Advisory Board Member, NevroNor, The Norwegean Research Council since 2008 (Gitte Moos Knudsen)

Member of the evaluation committee for professorship in neurology at Uppsala University (Gitte Moos Knudsen)

Member of evaluation committee for professorship in physiology at Helsinki University, Finland (Olaf B. Paulson)

Scientific Advisor for the British Medical Research Council (Olaf B. Paulson)

Evaluation:

Evaluator of PhD thesis: Peter Rasmussen: Near infrared spectroscopy for evaluation of cerebral oxygenation (Gitte Moos Knudsen)

Evaluator of PhD thesis: Mika Hirvonen: Genetic factors in the regulation of striatal and extrastriatal dopamine D2 receptor expression (Gitte Moos Knudsen)

Evaluator of PhD thesis: Kim Lindelof: Antinociceptive mechanisms in chronic tension-type headache (Steen Hasselbalch)

Evaluator for EFU (erhvervsforskerudvalget), Danish Agency for Science, Technology and Innovation (Jens Damsgaard Mikkelsen)

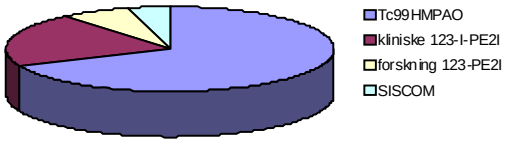
Evaluator for the EU 7th framework programme (Jens Damsgaard Mikkelsen)

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

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

6. SPECT Laboratory

A total of 460 clinical scans have been performed in 2009, 106 with the dopamine transporter ligand 123I-PE2I, the remaining with 99mTc-HMPAO. Furthermore, a total of 22 SISCOM-analyses have been performed (see figure).



Clinical diagnostic tool implemented in the SPECT laboratory in 2009

Dopamine transporter (DAT) and ^{123}I-PE2I described both visually and with semi-quantitative analysis correlated to an age-matched healthy subject database.

Research projects carried out in 2009

- Reproducibility of ^{123}I-PE2I SPET in patients with decreased striatal dopamine transporter availability and clinical impact of MRI co-registration
- ^{123}I-PE2I SPECT as a diagnostic tool in clinically uncertain parkinsonian syndromes
- ^{123}I-PE2I SPECT in clinically uncertain parkinsonian syndromes and BDNF
- ^{123}I-PE2I SPECT and NPH
- European database of ^{123}I-FP-CIT(DATscan) SPECT scans of healthy controls (ENC-DAT)

- Head-to-head comparison of the DAT tracers ^{123}I-PE2I and ^{123}I-FP-CIT in healthy subjects
- Energy correction for both scatter and down scatter for I-123 in SPECT-studies
- Computer simulation for the elimination of optimal low-pass filter cut-off frequency

7. Acknowledgements

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Augustinus Foundation

Danish Agency for Science, Technology and Innovation

Danish Medical Research Council

Danish Technological Institute

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Ludvig and Sara Elsass Foundation

NeuroSearch

Rigshospitalets Jubilæumsfond

Savværksejer Jeppe Juhl og hustru Ovita Juhls Mindelegat

The Capital Region of Denmark

The Lundbeck Foundation

The Novo Nordisk Foundation

The Research Council of Rigshospitalet

Trygfonden

University of Copenhagen, Faculty of Health Sciences and the Neuro Cluster

International research funding:

EU 6th Framework programme DiMI (LSHB-CT-2005-512146)

EU 7th Framework programme EURIPIDES (HEALTH-F5-2007-201380)