Form 2. Descriptions of Research Activities and Strategic Research Aspects

2.1 General description of the department and research activities

Department: Clinical Sciences Lund

Head of Department (submitter): Roland Andersson

The Department of Clinical Sciences, Lund, is by far the largest department within Lund University. Clinical Sciences, Lund, is structured in four sections with totally 37 units, lead by a professor or corresponding, each unit including several research groups. Below we have highlighted the most successful research activities within the different specialties.

Sections I-II

EMERGENCY MEDICINE

consists clinically of 5 wards with 20-26 beds each and an emergency unit that admits 60-70,000 patients per year. The academic unit serves teaching of medical and nursing students and other staff, and perform research in the clinic and in laboratories at the Biomedical Center (BMC).

The research profile is mainly directed towards cardiovascular disorders and we approach it from all angles necessary for a truly translational research. We study coronary ischemic conditions, vascular problems in congestive heart failure, aging problems, angiopathia in diabetes, vascular dysfunction in smoking and hypertension, inter alia. Most of these problems can also be studied experimentally.

We collaborate with different other departments for clinical studies, e.g. cardiology, clinical physiology, neurodisciplines, including departments at UMAS. Concerning basic science work, we collaborate with BMC.

We have a free flow of colleagues that are invited to different projects. We have a good collaboration with other departments at USIL, LTH and Natural Science departments; applicable e.g. to EKG research on how to evaluate in emergency cases. Many colleagues have projects with Ideon Research Park.

ANAESTHESIA AND INTENSIVE CARE

The unit consists of 8 research groups, each with its own leader. The research is both clinical and experimental, and comprises studies on sepsis, general trauma, neurotrauma, cool protection after cardiac arrest, lung function in prematures issues regarding coagulation, and anaesthesia. Our unit has national specialty for malignant hyperthermia. Anesthesia and Intensive care is a multidisciplinary clinical field with strong connections to general and thoracic surgery, pediatric as well as physiology, also characterizing the research. The unit is involved in both clinical and preclinical education for medical and dental students, and nurses. The research has had a large impact on the treatments of patients, but also on teaching. Two wide spread textbooks and chapters in larger textbooks have been produced during the last years. The unit has a very high impact internationally regarding research in head trauma, cooling after heart arrest and lung premature research.

CARDIOLOGY

One professor, 6 ass. professors (independent research group leaders), several other research positions and totally 14 PhD students are included within the unit.

Cell transfection molecular pharmacology, large animal infarction model MRI and SPECT, platelet pharmacodynamic methods. Cell sorting and isolation cardiac progenitors. Several mouse knockout models. LUNDHEARTGENE biobank. Signal-averaged P wave analysis (PSA-ECG) and frequency analysis of fibrillatory ECG (FAF-ECG) Monophasic action potentials (MAP). Phase II and phase III units.
Basic cardiology education and a selective course in acute coronary syndrome.
Part of the strong research environment "Vascular Wall". Former Lund Heart Research Center 2007, for clinical heart research (http://www.med.lu.se/english/klinvetlund/cardiology/lhrc). Former Center for Integrative Electrocardiology together with Institute of Technology for new approaches to registration and analysis of cardiac signals.
The only complete cardiology unit in Sweden (Heart transplant, electrophysiology, ICD, PCI, percutaneous valve intervention) with translational research ranging from genetics in large biobanks, cardiac progenitor development, knockout mice, molecular pharmacology, arrhythmia research, cardiac device development, platelet research to phase II-II studies.

RESPIRATORY MEDICINE AND ALLERGOLOGY
The unit has two professors. Several basic and clinical research groups form translational research teams. There is one well-equipped clinical research lab for patient phenotyping of patients and subjects from epidemiological samples with asthma and COPD, and the groups have good possibilities to perform invasive studies using bronchoscopic methods as well as non-invasive samples from the airways. Furthermore, there is abundant possibilities to get tissue for cellular characterization from bronchoscopic samples of tissue from bronchi as well as from lung tissue achieved by tranbronchial biopsies, methods that have not been used in these diseases earlier. Tissue are used from lung operations and transplantations in well-characterised patients as well as control smokers, without disease and never-smokers. The inflammatory patterns in the tissue from these subjects are then used for testing hypotheses on the inflammatory events in both diseases. The basic research groups in the team are working with matrix biology, of uttermost importance for the disease development in asthma and COPD, cellular morphology dealing with receptors and markers of importance for the development of inflammation, as well as genetic methods. The different groups interact with weekly seminars. This research is in the frontline of respiratory inflammatory research.

MEDICINE
The unit includes the clinical specialties general internal medicine, endocrinology-diabetology, and gastroenterology-clinical nutrition and is lead by a professor. The unit has strong research profiles within diabetes and gastroenterology with part of the focus on nutritional aspects and has an active laboratory science that is well integrated with the clinical science. It is actively engaged in teaching activities. Postgraduate courses eg for the European Nutrigenomics Network and diabetes program have been arranged. Some research is interdisciplinary involving collaboration with several departments within the diabetes program or within informal gastroenterological and immunological networks. As indicated by the publication in well renowned journals, invitations to give lectures at conferences etc, the diabetes research and the lipid signalling studies are internationally well competitive.

MEDICAL ETHICS
Courses in medical ethics are given by staff members at Lund University, at various clinics of the university hospital, and at hospitals in the region. Medical ethics is an interdisciplinary research and teaching subject. Research is carried out by, or together with, researchers with their basic training in different faculties (medicine, humanities, law, theology, etc.). The main focus of the research and teaching is on actual clinical problems, as well as on contemporary problems in medical research ethics, and contemporary risk analysis.
The dissertations have themes of ethical aspects of CPR, foregoing treatment, existential issues, children, birth, transplantation, paternalism, cardiology, hearth disease and substitute judgement. The present dissertations are about ethical aspects on stem cells, difficult information, transplantation and vaccination. We work with issues related to Caesarean section, nanotechnology, palliative care, paediatric, research misconduct and risk. Several units are and have been involved in the research: Belgium, Denmark, England, Finland, Iceland, Italy, Spain, Sweden, Switzerland, the Netherlands, and USA. Ethical problems regarding biomedicine, nano-medicine, medical decision making, medical risk analysis, contemporary research, are discussed with our students. Several of the books used and recommend are research based material.
We interact especially with units involved in research activities and cooperates with several other departments and faculties within LU. Medical Ethics has a very strong international reputation. It has played a key part in many EU-projects. From a national perspective it has, for many years, been leading. One of the researcher received the prestigious The Fulbright-Hildeman Grant 2004/05 and was in the same period Guest Professor at University of Texas at Austin, USA.
NEPHROLOGY
The unit has two major research groups funded by VR, The Renal Physiology Group, and the Vasculitis Group. Among other groups, the Nephrotic Syndrome Group has also been internationally successful. The research groups work more or less independently from each other, but there is also internal collaboration. The Renal Physiology Group deals with integrative physiology of transglomerular transport, more specifically the causes of microalbuminuria, and also transport kinetics in peritoneal dialysis (PD). The Vasculitis Group deals with the pathogenesis of vasculitis and certain types of glomerulonephritis using cellular, immunological, and molecular biology technologies. Both groups have unique access to a well-characterized patient material and a bio-bank material from (2000) patients who have been biopsied for various glomerular disorders. Both groups have vast international contacts and collaborations, and are involved in teaching, post-graduate education, production of textbook chapters, and via networking, collaborate with other departments within and outside Lund University. The Renal Physiology Group is part of the Vascular Wall Program, while the Vasculitis Group has a central position in the Blood and Defense Program. The Nephrology unit in Lund is scientifically probably the highest ranking nephrology unit in Sweden, and also has a high stature internationally.

THORACIC SURGERY
A major resource is the operation theatre for big animal research with 10 tables. Advanced equipment for hemodynamic and respiratory measurements, X-ray, ultrasound etc.
The experimental and clinical research has been noticed around the world. Leading centres on lung transplantation and cardiopulmonary resuscitation regularly come to be taught in these topics.
Broad cooperation between different specialities at the University Hospital and the Faculty of Engineering at Lund University.
World leading unit in work on lung transplantation, lung reconditioning and cardiopulmonary resuscitation.

Section III

DERMATOLOGY
The Dermatology and Venereology unit live in symbiosis with the Department of Dermatology, Lund University Hospital. Four main research groups are each lead by principal clinical investigators.
The research profile is skin inflammation at the interface between host and environment, more specifically innate immunity, allergy and itch.
A revised edition of a textbook for undergraduate students has been published.
Research collaboration exists with the Departments of Chemistry and Physics, Faculty of Natural Sciences, Lund University and Department of Experimental Medicine, Medical Faculty, Lund University, and outside the university with groups in Gothenburg, Uppsala, Umeå, Kiel, Krakow and Seattle.
The research is of good international standard.

INFECTION MEDICINE
The unit has modern research facilities at the BMC and comprises approximately 40 full-time employees working in 6 independent groups. In addition, 8 physicians from the Infection Clinic at Lund University Hospital, currently participate in the various projects. The research has a common theme; studies of host-bacteria interactions – clinical, molecular and cellular aspects. The scientific questions are addressed by researchers with competence in different areas; clinical medicine, microbiology, biochemistry, molecular biology and immunology, and there are many interactions with other units within the Department, but also with other Departments at LU and at other Swedish and international universities. The unit is engaged in graduate and undergraduate education focused on infectious diseases, innate immunity, and cell and molecular biology.
ORTHOPEDICS
The major part of the health care consumption in musculoskeletal disorders is caused by fractures, joint diseases (osteoarthrosis and rheumatoid arthritis), back problems, injuries, and tumors. This pattern is reflected in the research activities. Laboratory facilities exist within the unit for the following areas: biomaterial, biomechanics, cartilage metabolism, animal experiments, bone transplantation and radiostereometry. In addition to some 30 M.D. clinical investigators, a total of 3 laboratory technicians, 4 engineers/engineering students, 5 statisticians and 6 secretaries are engaged in the research work. Currently, a total of around 15 graduate students are working on their Ph.D. theses. With the opening of the Biomedical Center (BMC), linked to the University Hospital, the collaboration with preclinical research in cell- and molecular biology within connective tissue was enhanced.

RHEUMATOLOGY
The research activities at the Rheumatology unit focus on various aspects of rheumatic conditions and many of the projects are characterised by close collaboration between clinical and basic researchers in a translational fashion. The research on inflammatory arthritis spans from studies of effects of intervention e.g. rehabilitation or biological medication to identifying pathophysiological mechanisms and markers for tissue damage. Another line of research focuses on clinical and experimental studies of SLE making use of our unique well-characterised epidemiological patient cohort. Another group is primarily working with systemic sclerosis where a large cohort of patients are being monitored. A number of integrated projects are also ongoing. Researchers from the Rheumatology unit are involved in many national and international research networks. Educational activities include courses on basic and postgraduate level and editor and authorships of national and international textbooks.

Section IV

CHILD AND ADOLESCENT PSYCHIATRY
The main research profile has been “Children at risk – Child Maltreatment. Other areas: Eating disorders, Children with hearing impairment and children with ADHD.
The unit has been very active in teaching based on the performed research, especially in the following topics: Child sexual abuse, sexual exploitation, child prostitution, child physical abuse, child maltreatment, young sexual offenders, hearing impaired children and abuse, eating disorders.
The unit has a good reputation as one of the leading research centers in the field in the northern part of Europe, both when it comes to child abuse and neglect and eating disorders. Researchers has been very active in the Baltic Sea Regional Study on Adolescent’ Sexuality.

EXPERIMENTAL BRAIN RESEARCH
The LExpBr involves around 15 persons, with an increased proportion of scientists at the ass professor and post doc level during the last five years. The focus is on translational stroke research (animal and human studies) evolving around mechanisms of cell death and tissue plasticity following brain damage. The aim is to find pharmacological targets for stroke therapy. This research includes relevant rodent and in vitro models of brain damage, 2-photon microscopy and live cell imaging as well as gene profiling and proteomics. LExpBr interacts with the neurology, medical physics, neuroradiology units and the Department of experimental medical sciences. With 30 years experience of stroke research LExpBr has a unique international position and participates in one of two stroke consortia funded by the European Union. LExpBr participates in teaching and training of students in Medicine and Biomedicine. 23 thesis originate at LExpBr.

CLINICAL NEUROPHYSIOLOGY
In order to elucidate the pathophysiology of neurological and psychiatric disorders, different parts of the brain, engaged in normal activity, are investigated. The platforms are: A brain dedicated SPECT camera. A laboratory for integrated electrophysiology and neuropsychology enabling us to make 3D reconstructions of rapid neurophysiological events during computerised test sessions. A platform for coregistration of SPECT (regional blood flow and other functional modalities), electrophysiology (EEG, event related potentials, and MRT. By collaboration with the Neuroradiology unitin access to a new 3,0 Tesla MRI camera for fMRI.
Interdisciplinary collaboration with several clinical research groups within and outside the two university hospitals, including neurology, child neurology, radiology (epilepsy research), psychogeriatrics (dementia
research), psychiatry (suicide research), neonatal intensive care (research on continuous brain monitoring in NICU), anaesthesiology (research on brain monitoring after cardiac arrest and during hypothermia treatment), psychology (memory research), hand surgery and endocrinology (diabetic neuropathy), orthopaedics (spinal cord monitoring)
Teaching responsibility in basic neuroscience and clinical neurophysiology.

LOGOPEDICS, PHONIATRICS AND AUDIOLOGY
The Logopedics, phoniatrics and audiology unit is responsible for two master programs; speech and language pathology (SLP) and audiology as well as research education in SPL, phoniatrics and audiology. The research is focused on developmental language disorders, cognitive and linguistic development in children with cochlear implants, voice function, and speech motor control. Most of the staff is active in both research and teaching and there is a continuous introduction of scientific advances into the undergraduate and graduate curriculum. Ongoing research collaborators in Lund include Clinical Neurophysiology, Linguistics, Psychology, and Cognitive Science.

NEUROSURGERY
A major resource is the Raising Laboratory for translational neurooncology, now comprising 20 full or part time researchers and about the same number of clinicians involved, divided into a number of subgroups, including e.g. 14 PhD students.
The Brain Immuno Gene Tumour Therapy group (BRIGGT) comprises 20 researchers and clinical staff. This group has translated basic research into a treatment model for patients with glioblastoma multiforme. The laboratory is unique in the world and clinical results have been successful with a prolongation of life of about 80%.
The Glioma ImmunoTherapy group (GIT) run a series of animal studies to find new and improved techniques to translate to the human situation.
The Stem Cell group study the possibilities to utilize exogenous stem cells as therapy for malignant glioma. Electroporation and -fusion for gene transduction treatment of tumours and neurological diseases is studied in a collaboration between the Raising Laboratory and the dept for Medical Radiation Physics.
The Spinal Cord Injury Group has developed models for spinal cord injury in the rat and experimental therapy with a patented cell line will start during the spring 08.
The research activities within the Neurosurgical unit cover most fields of neurosurgery including neurooncology, functional neurosurgery, spinal research, vascular neurosurgery, neurotrauma and intensive care, and pediatric neurosurgery.
Neurosurgery has extensive collaboration with anaesthesiology, neurophysiology, neurology, neuropathology, neuroradiology, oncology, clinical genetics, paediatrics, radiophysics, nationally and internationally, and also with other faculties at Lund university.
At least 2 textbooks for education have been published during later years. 11 dissertations have been defended within the last 3 years and at present PhD 14 students are under education.
The neurooncological research is positioned in the international frontline, especially concerning the clinical application of the immuno gene therapy developed. Also functional neurosurgery in connection with Parkinson treatment is of very high standard. We have international collaboration with a number of universities (Duke University, Durham, NC and Columbia University, NY, USA; Nagoya University, Japan; Shantou University and Fudan University, Kina; The University of Melbourne, Victoria, Australia. The University of Perth, Australia. The Panum Institute and Niels Bohr Institute, Copenhagen).

NEUROLOGY
The Neurology unit comprises 6 independent research groups. There is a strong focus on experimental, translational, and clinical research in Parkinson’s disease, stroke, and epilepsy.
For several projects, close collaboration between clinical and experimental research has been established. Research on stem cells as stroke therapy is currently at a breaking point when experimental studies are carried into clinical testing, necessitating input from both fields. There are well established collaborations between the clinical stroke research group and sections of neuroimaging, neurosurgery, cardiology, and genetics.
Academics involved in research are active at different educational levels. Evidence based medicine, literature search strategies and analyses of scientific papers are integral parts of the curriculum at medical school and other health educations. The unit arranges 2 selectives on acute neurology.

Academics have served as editors for textbooks (e.g. Subcortical Stroke, Oxford University Press) and chapter contributors for international textbooks, and for the main Swedish textbooks for graduate education. For about 3 decades, the unit has arranged annual post-graduate courses in cerebrovascular disease. There is strong collaboration with the Department of Clinical Sciences in Malmö, and other experimental groups at the Wallenberg Neuroscience Center and the Stem Cell Institute.

The Neurology unit is established, standing as one of the 2 top Swedish neuroscience institutes, with a solid international reputation. We have a long tradition as pioneers in clinical and translational research in several fields. Academics have major international positions as editors, members of editorial boards, executives of scientific societies.

**OPHTHALMOLOGY**

At the Ophthalmology unit clinical and experimental research regarding retinal degeneration has been pursued since 1985. During recent years the team has expanded and the structure has changed from one large group to four. The experimental and clinical laboratories are sponsored by grants from e.g. the government (Swedish Research Council) and the Medical Faculty at Lund University, as well as from the US (FFB: Foundation Fighting Blindness; Gail and Richard Siegal Foundation) and EU (EVI-GENORET, NEUROTRAIN). The applicants sustain active collaborations with various top-level international laboratories. Several of the senior researchers are involved in teaching, at various educational levels, of students as well as medical and laboratory personnel.

**GERIATRIC PSYCHIATRY**

Four research groups, partly overlapping, emanate from Lund Longitudinal Dementia Study. Approx 6 members/group. Neuropsychological laboratory; unique cognitive test facilities. Research focuses on cognition, dementia and depression. Mapping deficient cognitive functions and studying physiological mechanisms, brain-behavior relationships, biomarkers and genetics to develop detailed diagnosis and intervention programs. Interdisciplinary cooperation; functional and morphological cerebral imaging, genetics, biomarkers and evaluation with neuropathology, shared supervision for PhD students between departments.

All members in the research groups are involved in teaching; medical and psychology students, student nurses, interns, and the public incl pharmaceutical industries.

**PSYCHIATRY**

The unit mainly consists of 6 research groups, lead by a professor or associate professors. We have educational matters and administration in common.

The areas of interest span from epidemiological (the Lundby Study) to preclinical psychiatric research (Molecular Psychiatry Unit) via clinical research on mood disorders/suicidality, psychotic disorders and alcohol dependence in various settings. Several research aspects are covered. Preclinical- clinical – nursing translational projects are performed and collaboration exist with Scandinavian universities and also e.g. with Oxford, Columbia University, N.Y., University of B.C., and Nanjing University. Projects in Uruguay are pending.

Teachers are engaged in basic training of various student categories, and research has a substantial impact on education. One textbook was recently published.

Our unit is known nationally and internationally, not at least concerning the Lundby Study and the research on mood disorders/suicidality.

**REHABILITATION MEDICINE**

The unit was established 2006 and is linked with the clinical rehabilitation medicine clinic, one of the largest in Scandinavia. Research comprises studies of the short- and long-term consequences of trauma and diseases to the nervous system and long-term non-malignant pain, the development and implementation of novel therapeutic rehabilitation interventions and their effects in people with life-long disabilities. Research is conducted in collaboration between rehabilitation medicine physicians and other rehabilitation professionals such as physiotherapists, occupational therapists and psychologists, providing a unique interdisciplinary atmosphere. The unit is part of a large center for studies on ageing and supportive environments (CASE), funded for 10 years by the Swedish Council for Working Life and Social Research.
OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY

Otorhinolaryngology is a diversified specialty where different techniques are applied and so is the research. It is best described as a combination of basic research, motivated by defined problems and clinical research with development of new treatments and diagnostic methods. The research is organized in 5 major fields i.e. 1. Human balance and inner ear disorders; 2. Allergy in the upper airways and membranous disorders; 3. Squamous cells cancers of the head and neck; 4. Infectious diseases of the ear and throat. 5 Sleep apnoe. We are since about 3 years also forming a group in audiology. The research groups described below are all at a national leading position and well recognized on an international level. For field 1-2, 5 one may consider the groups as among the top leaders in their respective area. Groups 1-3 have larger funds from either the Swedish Research Council or the Cancer Society, with funded positions and group 2, 5 external and commercial funding. The unit is a tertiary referral center with nationwide and international referrals for some diagnosis. Therefore we have the opportunity to recruit patients, retrieve measurements and samples and implement results. The different research groups also correspond to main issues in the corresponding clinical field. It has therefore been possible to have teachers with contact with frontlines in research as well as clinical practice also in the basic teaching.

Section V

CANCER EPIDEMIOLOGY

The unit work close together with the Oncological Centre for the south health care region, responsible for the cancer-, quality- and biobank registries. Also disease outcome in a number of large cohorts with extensive exposure information is followed through available population based regional and national registries. Descriptive, analytic and interventional cancer epidemiology is performed at this unit. Examples of our research are the following: Reasons for difference in survival for breast cancer patients in Skåne and Denmark; the EUROCARE project, which collects data from a large number of cancer registries in Europe in order to differentiate the different survival curves in the respective countries; population based studies of genetic and environmental causes of tumour diseases in Sweden; soft-tissue and bone sarcoma study of risk factors and clinical trials in cooperation with the five Nordic countries, Europe and USA; risk factor analysis in malignant lymphoma; late effect studies in paediatric patients with cancer; health economic analysis in cancer patients. Close cooperation between tumour biology researchers, pathologists, radiologists, clinicians (surgeon, oncologist, haematologist) has been established. The cooperation between the five Nordic countries, many European countries and USA is well functioning.

The unit is regularly involved in cancer epidemiological education of medical students including prevention and evaluation of cancer incidence, prevalence, mortality, screening and cancer risk factors.

The unit is heavily involved in research projects and doctorial theses emanating from other units using information from available registries or consulting the unit about statistical or epidemiological know how.

We have a large national and international network in research and the unit is well known in Europe and USA.

CLINICAL PHYSIOLOGY

The unit comprises 3 research groups, the Cardiac MR Group, the EKG group and the Lung Group. During the last 5 years 70 original articles have been published and 9 doctoral theses defended.

We have within the unit state-of-the-art magnetic resonance imaging (MRI), single photon emission tomography (SPECT), computed tomography (CT), ultrasound, and positron emission computed tomography combined with CT (PET-CT). A unique set of methods, largely developed by us, allows advanced studies of lung function, e.g. for ventilation/perfusion SPECT imaging, comprehensive lung function tests at rest and exercise, and tests in critically ill patients.

The unit is highly active in clinical teaching, e.g. basic and clinical physiology for physicians, physiotherapists, biomedical technicians, graduate engineers. Teaching is closely linked to our research.

Collaboration exists with University of California, Duke University, Johns Hopkins, European Association of Nuclear Medicine, EANM, Fudan University, Shanghai. The unit also lead a task group for lung diagnostics within the European Association of Nuclear Medicine (EANM).

Each group, Cardiac MR, EKG and Lung is of international standing being frequently invited to give lectures, chair sessions and organize international meetings.

DIAGNOSTIC RADIOLOGY

Advanced MR and CT equipment with extensive research collaboration with manufacturers. Sweden’s only
radiology unit with two 3T MRI scanners.
Primary research profile is neuroimaging and skeletal radiology, but all aspects of radiology are covered.
Diagnostic Radiology actively participates in the broad imaging initiative "Lund Bioimaging Center".
Since 20 years an active cooperation with Medical Radiation Physics, primarily within MRI. Large collaboration
with clinical departments regarding neuroscience (e.g. stroke, vascular interventions, dementia, epilepsy). During
the last 5-year period also a very broad engagement in international radiology and its development.
Lund School of MR, invited lectures, textbooks (e.g. NICER Imaging Encyclopedia, editor H. Pettersson).

ELECTRON MICROSCOPY
The Electron Microscopy unit was formed in the middle of the 1980s as a service facility for electron microscopy,
in first hand, within the medical faculty. Other clients from the University or outside are also served if possible
and research is also done in collaboration with other groups.
The unit is equipped with one Transmission and one Scanning microscope with accessory for elementary analysis
with EDS, equipment, ultra microtome, high vacuum evaporators, sputter coater critical point drier and so on,
for preparation of samples is obviously also available.
The unit is processing a large variety of samples, from molecules, microorganisms, tissue and even some
materials.

MEDICAL RADIATION PHYSICS
The unit is organized in four research groups, systemic radiation therapy(nuclear medicine), medical magnetic
resonance, radiation therapy and radioecology.
Systemic radiation therapy: In the last five years a research laboratory has been built including SPECT/CT, PET
and cyclotron with both preclinical and clinical research. New high resolution imaging detectors are developed.
Development of dosimetry method for internal radionuclide therapy including image reconstruction and
quantification algorithms, image registration and 3D modeling of radiation transport on macroscopical and
small-scale level is undertaken.
Medical magnetic resonance has its primary focus on development of new techniques for assessment of
microcirculation (perfusion), molecular motion (diffusion) and macrocirculation (flow).
Recent installations of two 3 tesla MRI scanners in Lund provides one of the most modern and well-equipped
MRI facilities in Scandinavia. The plan is to create a Medical Bioimaging Center in close collaboration between
18 research groups at 4 faculties.
In radioecology special resources are advanced alpha and gamma spectrometry low-level laboratories, and
instrumentation/equipment for field measurements under regular and emergency situations. We also have access
to, through collaboration, AMS, Accelerator Mass Spectrometry and ICP-MS, Inductively Coupled Mass
Spectrometry.
The research profile focuses on the study of radioactive elements in the environment from different sources and
their transport and kinetics in man. Developing analytical methods related to radiochemistry and nuclear
measurement techniques is an important part of the research.
Investigations of radon exposure in houses plays an important role for the total natural exposure to man in
Sweden. Especially methods for retrospective assessment have been developed. The whole activity is
multidisciplinary within physics, chemistry, and radioecology.

BIOMEDICAL ENGINEERING
Biomedical Engineering has specific resources including equipment for High Intensity Focused Ultrasound
(HIFU), and for analysis of diagnostic ultrasound signals, for tissue analysis.
The main research is focused on medical ultrasound. In diagnostics, analysis of the echo signal from different
types of tissue is studied. Also studies on tixotrophic characteristics in fluids, in combination with induced
ultrasound are performed. Furthermore, temperature measurements with ultrasound is studied. In the therapeutic
area, High Intensity Focused Ultrasound (HIFU) is studied for tissue destruction, for non-invasive cancer
treatment.
The HIFU-project has been carried out in close collaboration with both Diagnostic Radiology and Surgery units.
Education and courses are held on graduate and postgraduate levels and for different types of staff. A textbook
on Diagnostic Ultrasound is edited from the unit.
A close collaboration with the Dept. of Electrical Measurements, at Lund Institute of Technology, is carried out
within the ultrasound research area.
OBSTETRICS AND GYNECOLOGY
The unit is integrated with the clinical department. Clinical research is performed at the clinical wards, ultrasound unit, laboratory for studies of fetal physiology, the biochemical and molecular biology research at the laboratories within BMC, and the animal experimental work (unique sheep model of transition from intra- to extrauterine life) at the in vivo unit of BMC. The perinatal epidemiological research is done together with the Center of Reprod. Epidemiology.
The strongest research profile is within perinatology with 6 research groups (fetal physiology esp. feto-placental circulation, obstetric ultrasound, diagnosis of perinatal hypoxia, animal experimental group, pathophysiology of preeclampsia, perinatal epidemiology). Other research areas: Molecular mechanisms of pericellular proteolysis and cell migration in tumour biology; Genital infections; Oxytocin and vasopressin in preterm labour and in dysmenorrhoea; Population based studies of perimenopausal women (Health of women in Lund area).
Close collaboration with the Pediatrics unit within perinatology and with other research groups in BMC.
All perinatological groups cooperate and perform joint studies.
All researchers participate in undergraduate teaching. The worldwide prominent standing in the ultrasound research is reflected in organising and participating in national and international postgraduate courses. Two basic obstetric textbooks in Swedish, one in Czech and one in Russian have been edited from the unit.
Follow-up studies are performed of children together with Inst. of psychology; development of ultrasound methods with Inst. electrical measurements, Technical university, and the Tornblad Institute with its world unique register containing deliveries and possible of harm of medication.
International frontline of ultrasound research, research on oxytocin receptors, perinatal epidemiology, perimenopausal health -WHO Collaborating center in perinatology, membership (presidency) of several world organizations.

ONCOLOGY
The unit is the largest research unit within the Department with several academic positions. It is part of several networks of excellence at faculty and national levels, most importantly are CREATE Health, SWEGENE, Lund Stem Cell Centre and Lund Laser Centre.
Special resources are the very close connection to the Oncologic Clinic and the Department of Cancer Epidemiology/regional tumour registry; The Kamprad laboratory building; Laboratories at BMC.
Platforms for molecular biology, imaging, animal models, biomedical optics, biobank, regional and national registries, Oncologic clinical research unit (OKFE), radiotherapeutic section.
Research activities include both preclinical and clinical research; from tumour cell biology to psychosocial oncology, with focus on epidemiology, prevention, diagnostics, prognostics, treatment (including -prediction, -targeting, -monitoring), and multicenter studies.
Multi- and interdisciplinary activities include CREATE Health; SWEGENE; Lund University Medical Laser Centre (LUMLC); Cancer Stem cell program; Swedish Oncogenetic Group; South Swedish Breast Cancer Study Group; Swedish and Nordic Breast Cancer Groups; Swedish Lymphoma Group; SWENOTECA; The Scandinavian Sarcoma Group (SSG); Cell and Cancer Imaging
The research activities are mostly translational, combining different disciplines and expertise of relevance.
Oncology is responsible for education of medical students in oncology during 4th and 8th semester and supervision of graduate and Ph.D. students (presently >30). Postgraduate education in radiotherapy, and education for oncologic nurses and doctors.
Relation to interactions with other departments within LU: Divisions of Atomic Physics, Theoretical Physics, CREATE Health, Swegene, Lund Stem Cell Centre, Division of Genetics, Mathematical Statistics, Radiation Physics, Cell- and Organism Biology, Malmö Food and Cancer, Cancer Epidemiology, Occupational and Environment Medicine, with hospital disciplines for cancer diseases (surgery, radiology, pathology, genetic clinic etc)
The unit has a large national and international network in research with large national and international grants emanating into more than 100 publications per year and is internationally well known.

PATHOLOGY
Two separate research groups, one working with neuropathology, one working with cellular imaging in tumor- and inflammatory related projects. The cellular-imaging group has a broad equipment of diverse modern microscopes and microscopy tools, forming a core facility for other research groups within LU, which utilize the equipment and personnel expertise. Interdisciplinary activities is basic for the research activities of the two groups, as well within and between institutions and faculties of LU, as well activities within Sweden and other
countries. Personnel in the groups take very active parts in basic and graduate education. The cellular-imaging group give advanced course for research students.

**PEDIATRICS**
The unit has broad activities with major research fields being neonatology, pediatric nephrology, and pediatric cardiology, as expected from the organisation. Other important clinical research areas are oncology, habilitation and early orthopedic surgery for CP, epilepsy diagnostics and treatment, endocrinology and pediatric surgery.

Multi- and interdisciplinary research is illustrated by e.g. the “Blood and Defence Network” at LU with several national and international collaborators and joint positions between Lund and the University of Helsinki (neonatology). The researchers in neonatology have a fruitful collaboration with obstetrics, neurosciences, and immunology at LU, as well as with neonatologists in other countries (eg. within EU-funded FP6-project). Continuous collaboration between HU,CU, and LU occurs in pediatric cardiology. A long-lasting collaboration continues between Nordic countries in pediatric oncology, and with other countries. Pediatric endocrinologists have research collaboration with those in Malmö.

Teaching is performed on several levels and is an active part of the activities in the unit.

The unit is on high national as well international level in at least four major areas: pediatric nephrology, cardiology, oncology, and neonatology.

**UROLOGY**
Lower urinary tract dysfunction affects several hundred millions of sufferers in Western countries. The three major patient groups are those with urinary incontinence, bladder outlet obstruction and neurogenic disorders. The underlying pathophysiology of the involved lower urinary tract organs in incontinence is poorly understood and therefore hampers diagnosis, prevention and optimal treatment. In female incontinence we study the bladder outlet, the urethra and the pelvic floor with EMG, pressure measurements, biofeedback, transcutaneous electric nerve stimulation, three-dimensional ultrasound, urodynamic investigations including urethral and bladder measurements. We are challenging traditional transurethral surgery (TURP) for benign prostatic hyperplasia (BPH) with an outpatient method based on microwave thermotherapy. Measurement of the intraprostatic temperature during treatment allows individualized therapy. Urinary and fecal incontinence in elderly is investigated including an interventional study in elderly dependent people.

**SURGERY**
Surgery has had a high research activity with up to 20 registered PhD students and in average 4–5 doctoral theses presented annually.

Facilities for translational research bridging clinic and pre-clinic together are good. Overall, the research contains both “guts and glands”. By tradition, research on visceral surgery and associated items has been a focus area in Lund with high activity, especially within the field of upper gastrointestinal surgery including esophagus, stomach, hepato-pancreato-biliary, malignant and benign both together. The endocrine surgical section within the unit has a strong position nationally and internationally with a continuous good flow of high quality papers and PhD’s, not at least within the field of hyperparathyroidism. The section for mammary surgery has also an intense collaboration and research with the oncology unit.

Teaching at undergraduate and postgraduate level involves all physicians and not only academic teachers. A number of textbooks for medical education has been edited from the unit.

The unit has collaboration with several pre-clinical and clinical research groups and units and other departments within Lund University.

The unit has a firm platform and good reputation nationally, in many areas ranked at least at the second concerning activity. The national and international collaboration is well developed with networks both in Scandinavia and Europe including both pre-clinical and clinical studies as well prospective randomized trials. Recently we also have a collaboration Zhongshan Hospital, Fudan University, Shanghai, with an exchange of visiting professors both in Shanghai and Lund, the latter financed by the Swedish Research Council.
Strengths: The well defined organization paralleling the clinical departments is a major advantage, providing opportunities for gathering samples and patient materials, recruitment of researchers, implementation and clinical development. A close co-operation and the vicinity to the Biomedical Center and the technical and science faculties, promote translational research and development of new techniques. Local collaboration with Medicon Valley, the pharmaceutical industry and national and international networks.

Weaknesses: The retirement and severe cut-backs of academic staff decrease academic leaders, resulting in decreased research and educational activities. Focus on production of health care and economic cut-backs rivals research and academic activities. The relative lack of ways to implement clinical research findings to clinical use or potential commercial development is a weakness.

Opportunities: Increased co-operation with experimental departments, other faculties, including technology and the pharmaceutical industry in translational research and education. Lund has one of the largest training facilities for clinical skills (Practicum). Possibilities of formation of multicenter clinical research centers. Development of a scientific interface and nationally and internationally improved collaboration with the pharmaceutical industry and venture capitalists, emphasizing implementation of clinical research findings and entrepreneurship.

Threats: Reduction of academic staff (research and education) as a result of retirements. Cutbacks in health care and focus on pure economy may lead to a decrease also in academic staff, thereby limiting possibilities for e.g. time for clinical research, less incitament for doing research and an academic career, and for these reasons an impaired environment for academic activities.
EMERGENCY MEDICINE
Regulation of receptor expression in peripheral and cerebral circulation: How do the receptors function in cardiovascular disease? We have observed as the very first that some G-protein coupled receptors change their expression in disease. Risk factors for cardiovascular disease are involved in this process.

Studies of human peripheral circulation in hypertension: Previous studies have revealed enhanced levels of circulating messenger molecules in hypertension, but we have now found altered contractile responses in hypertension associated with increased expression of receptors on the vascular smooth muscle cells. We examine the hypothesis that the increased blood pressure leads to alteration in shear stress and in turn in the expression of receptors.

Studies of the trigeminovascular system in migraine pathophysiology: We have observed that the sensory neuropeptide CGRP (calcitonin gene-related peptide) is release in parallel with the headache and correlates with the degree of pain. In collaboration with the pharmaceutical industry a new medication has come forward which specifically block this receptor.

Role of natriuretic peptide in congestive heart failure: The inflammation processes in congestive heart failure and the use of "brain natriuretic peptide" as an early and strong marker for disease is studied, as is the use of cutaneous microcirculation as a surrogate marker for cardiovascular disease.

Effects of nitroglycerine treatment on CHF: Continued studies on circulatory responses in CHF patients.
Enhanced expression of Angiotensin II and endothelin receptors in coronary syndromes: Initial basal studies revealed that angiotensin II and endothelin-1 receptors are upregulated in various models of ischemia. This project is designed to evaluate if there are similar alterations in the expression in man. It is possible that the cutaneous circulation can serve as a surrogate marker for general cardiovascular disease.

Methods for enhanced diagnostics of ACS: Can the diagnosis of ACS be enhanced in the emergency setting? A prospective myocardial scintigraphic study is under way to evaluate the criteria for ischemic heart disease and to compare with other clinical parameters.

Pulmonary and deep vein thrombosis: novel treatment: We are involved in examining novel treatments for the disease group, specific thrombin inhibitors.

ANAESTHESIA AND INTENSIVE CARE
1) Development of techniques for non-invasive ICP measurement and a new therapy of severe head injury denoted "the Lund Concept". This therapy is based on the physiological principles for brain volume and cerebral perfusion regulation and is used worldwide. Outcome studies with this therapy have shown a marked reduction in mortality compared to conventional therapies. 2) Based on the protective effects of cooling, body temperature in patients suffering acute cardiac arrest is reduced actively for brain protection. Preliminary data indicates favorable outcome. A network for these patients have been created including also other hospitals for a more comprehensive analysis of the effect of the therapy. 3) Research regarding antimicrobial peptides is a field with great potentials to create future therapies of sepsis and severe infections. 4) Research on protection of lung function in prematures has resulted in new important principles for oxygen therapy. 5) Research in the field of malignant hyperthermia.

CARDIOLOGY
We are leading in several areas nationally and internationally: Delineation of details of the inflammatory mechanisms in acute coronary syndromes. Transcriptional profiling of platelets revealing novel receptors that are possible targets for drug development. Development of cell therapy for the heart: The techniques of advanced cell sorting and isolation cardiac progenitors and to develop cell therapeutic strategies for the heart. Cardioprotection using hypothermia. Percutaneous device development. Development of ECG-based non-invasive diagnostic modalities for assessment of cardiac arrhythmias. PSA-ECG and FAF-ECG techniques have been developed in Lund. Delineation of atrial conduction during AF for identification of persistent focal sources that drive the arrhythmia and that could become a target for catheter ablation. Novel mechanisms of infarction development found by genetic analysis.

RESPIRATORY MEDICINE AND ALLERGOLOGY
In the COPD field we have evaluated the early inflammatory changes in the airways of smokers related to early COPD. We have also shown that the protein pattern in broncho-alveolar lavage from smokers (using proteomic methods) shows specific markers before patients develop disease. Our further studies will concentrate on the relation of exacerbations and bacterial colonisation related to changes of inflammatory parameters in tissue samples from these patients. Another important finding is that COPD also has a probable systemic autoimmune component. We have found common patterns with arteriosclerotic disease, inflammatory bowel disease and multiple sclerosis.

In asthma a very important finding is that fibroblasts from samples taken in early asthma show an intense activity, indicating that matrix remodeling is very important, especially in the peripheral part of the airways. We think this is an important way to further characterize and phenotype different forms of asthma. Our results clarify that fibrocytes, a progenitor cell, has an important role in this remodeling. We have been able to study lung tissue and the matrix formation in patients with scleroderma, where the lung complications is of utmost importance in the prognosis.

We have developed a centre of excellence for clinical trials.

MEDICINE

Insulin Secretion and Type 2 Diabetes. This project uses an interdisciplinary approach to examine the mechanisms and impact of islet dysfunction in type 2 diabetes in order to develop novel strategies for improved therapy. Subjects with type 2 diabetes and healthy volunteers, experimental animals, isolated islets and cultured insulin producing cells are examined to:
- establish mechanisms of the islet compensation to insulin resistance and the failure of these mechanisms as the basis for type 2 diabetes
- identify the role of neuropeptides, glucoincretin peptide hormones, adipocyte-derived peptide hormones and islet peptides for regulation of islet function, for contributing to diabetes pathophysiology and as basis of novel strategies for treatment.

Major recent achievements: A major involvement of the autonomic nerves for the control of islet function has been established, mainly to control cephalic phase of insulin secretion and the glucagon response to hypoglycaemia. These effects are partially achieved by neuropeptides, such as galanin and pituitary adenylate cyclase activating polypeptide (PACAP). Furthermore, the novel approach for treatment of type 2 diabetes, which is based on the gut hormone glucagon-like peptide (GLP-1), has been established, with special focus on inhibition of the GLP-1 inactivating enzyme dipeptidyl peptidase-4 (DPP-4).

Lipid signalling in the gut – clinical and biological implications. Sphingolipids are key constituents of cell membranes and are also present in the diet. Metabolites formed during their metabolism are important messengers that regulate numerous cellular functions including cell differentiation, apoptosis and inflammation. The project is focused on the enzymes that regulate formation of sphingolipid metabolites in the gut, and their potential anticarcinogenic and anti-inflammatory properties, particularly with regard to colorectal cancer and inflammatory bowel disease and liver disease.

Major recent achievements: The group discovered and more recently purified, and cloned intestinal alkaline sphingomyelinase. This enzyme has anticarcinogenic and anti-inflammatory functions and was found to exhibit inactivating mutations in some colon and liver cancers. Neutral ceramidase was purified and characterized. Clinical studies showed for the first time effect of TNFalpha blockade in ulcerative colitis.

MEDICAL ETHICS


EuroStemCell: A project focusing on ethical aspects of stem cell research, funded by the European Commission.

ESTOLS: A project funded by the European Commission focusing on "philosophical pluralism in European decisions regarding Bio-ethics". The international standing is high.

CPR. Several hospitals, both nationally and internationally, have guidelines for CPR. The project aims to survey patients’ and physicians’ attitudes by interviews and questionnaires. One dissertation and one guideline for Lund University Hospital have been achieved. National impact.

End-of-life decisions: Such decisions are often made at the hospitals internationally, not at least when changing from curative treatment to palliative care. The project involves Australia, Belgium, Denmark, Italy, the Netherlands, Sweden and Switzerland using questionnaires and registered data. More than 15 papers have been published in international journals (incl the Lancet). The project mapped existence of euthanasia in the participating countries, the second questionnaire emphasized on palliative care.

Scientific misconduct: The project hopefully will influence the way by which such conduct is handled.
Preliminary results indicate that fabrication, falsification and plagiarism are seldom found in Swedish research, but policies at the department levels are seldom developed and harassments, for instance concerning pregnant woman, are rather common.

NEPHROLOGY
Mechanisms of microalbuminuria: Microalbuminuria is an early indicator of diabetic nephropathy and/or vascular disease. The pathogenesis of microalbuminuria has been very difficult to study in the clinical setting. How much is caused by defective proximal tubular reabsorption of albumin vs. real glomerular permeability changes? The project use very highly sensitive size-exclusion (SEC), gel filtration, chromatographic techniques (HPLC), using Ficoll of high mol. weight (MW) as probes for glomerular transport studies in animals, because Ficoll cannot be used in humans due to toxicity. With the technique used we have for the first time been able to make detailed studies of the various causes of microalbuminuria.
In almost all cases of microalbuminuria there is a decreased size-selectivity of the glomerular filtration barrier to high MW Ficoll, which can be described in terms of an increased number of “large pores” in the filtration barrier, whereas charge selectivity and “small pore” number are only little affected.
Altered neutrophil behaviour and the etiology of vasculitis: The most prominent histological feature of small vessel vasculitis is the accumulation of necrotic neutrophils in the vessel wall. We work with the hypothesis that acquired, age related changes make neutrophils prone to deviate from the normal route to apoptosis and removal without collateral damage. Similarly we believe that such changes predispose for autoantibody formation. We compare in vitro features of neutrophils and monocytes from patients with systemic vasculitis with healthy controls and with relevant disease controls. We study surface expression membrane bound proteins (using FACS), transcription (using realtime-PCR) and behaviour (spontaneous apoptosis, phagocytosis etc). We have found that neutrophils express increased amounts of PR3 on their surface and that surface expressing of PR3 is linked to the expression of another protein called CD177. Monocytes and to a lesser degree neutrophils overexpress mRNA for PR3. Neutrophils from stable vasculitis patients have a decreased tendency to undergo apoptosis in vitro compared to healthy controls and patients with SLE.
We have put forward a unique hypothesis, which if proven correct, will dramatically change the current view of autoimmune disease and provide new avenues for therapeutic interventions.

THORACIC SURGERY
Developed new methods to overcome the shortage of donor lungs. In approx. 75% of organ donors the lungs are rejected due to bad function. We have invented a flush solution for lung preservation: Perfadex, today used in 90% of the transplantations in the world. It prolongs the time between harvest to reperfusion from 6 hours to 24 hours. Developed and clinically implemented a method to recondition rejected donor lungs. Invented Steen Solution, used to recondition the lung function ex-vivo. Discovered important physiological circumstances regarding cardiac arrest. When cardiac arrest occurs the right ventricle quickly will be so distended that defibrillation will fail to establish spontaneous circulation. The importance of giving chest compression before defibrillation is done was first explained by us in an experimental large animal model.
Developed the mechanical chest compression/decompression device LUCAS (Lund University Cardiopulmonary Assist System) which today is in use in Europe, Asia and USA. LUCAS makes it possible to transport cardiac arrest patients with ongoing vital circulation to the hospital for casual treatment, eg. PCI, by-pass surgery.

Section III
DERMATOLOGY
One promising project is research on innate immunity of skin and blood, with particular focus on taking basic concepts to clinical therapy. We have discovered several novel and evolutionary conserved antimicrobial peptide “systems” in skin and blood, activated during injury and repair. These concepts are in the process of transformation into clinical trials.
In another successful project allergic dermatitis is studied by using novel synthesized hapten-modified peptides, chemically defined complete antigens. Immunization of mice gives specific T-cells, and T-cell hybridomas are produced. Cultured antigen presenting cells, our synthesized complete antigens and the hybridoma cells constitute a completely defined immunological synapse, which is used to investigate allergic eczema and drug hypersensitivity and the cross reaction pattern of these allergies.
INFECTION MEDICINE
The projects at Infection Medicine are among the most highly prioritized at the Swedish Research Council and by the local ALF committee, and the Division represents one of the top international laboratories in the area of bacterial pathogenesis (papers published in Nature, Nature Medicine, J. Exp. Med., EMBO J., PNAS, CELL, PLoS etc.).

ORTHOPEDICS
Research on joint disease and its consequences spans from basic genetic and biochemical investigations to applied projects which monitor nationwide the outcome of arthroplasty and includes development of methods for diagnosis and monitoring of early-stage osteoarthritis; epidemiology and risk factors for osteoarthritis following joint injuries; improved diagnostic and reconstructive techniques after knee ligament injury; improved techniques for joint replacement in the rheumatoid joint; studies of processes and causes of joint implant loosening in hip and knee.
Fracture research includes a prospective multicenter study investigating the epidemiology and treatment of hip fractures and its effects on health care economy.
Biomaterial and Bone Biology Research includes a study of the process of bone induction and its stimulation by human recombinant growth factors, and synthetic bone substitutes for fracture repair.
Research on lumbar back pain and sciatica aims to optimize patient information, surgical methods, postoperative treatment, and utilization of hospital resources. A new mini-invasive ultrasound technique for treatment of discal hernia is studied.
Research on different methods of treatment for gangrene of the lower extremity caused by diabetes is evaluated with regard to quality of life, cost, etc.
Research on orthopedic oncology evaluates diagnostic procedures, surgical techniques, and prognostic classification of soft tissue tumors. Surgical treatment of skeletal metastases are studied concerning technique and outcome.
Research in hand surgery includes evaluation and treatment of ligament injuries in distal radius fractures in young patients.
Research in pediatric orthopedics targets gait and function analysis in children with cerebral palsy and pathophysiology in Perthes’ disease.

RHEUMATOLOGY
The Section for Rheumatology is particularly strong in the field of matrix biology with an internationally leading position in the development of biomarkers for cartilage and bone turnover in joint and connective tissue diseases. A major achievement is the discovery and characterization of COMP (cartilage oligomeric matrix protein) and the development of a serum assay, which is now commercially available. This protein is currently the most studied and established tissue marker for arthritis worldwide. Another field, which is internationally competitive, is translational research concerning systemic lupus erythematosus where a number of world wide collaborative projects are ongoing. This includes networks where the genetic background to this disease is being characterized.

Section IV

CHILD AND ADOLESCENT PSYCHIATRY
The Baltic Sea Regional Study on Adolescents’ Sexuality. For a number of years child protection professionals and researchers have tried to find ways of addressing phenomena associated with child sexual abuse, child sexual exploitation against children. Within the Council of the Baltic Sea States a regional research network developed a study plan and invited researchers from the member states to participate in the so called Baltic Sea Regional Study on Adolescents’ Sexuality. More than 20 000 students (4 339 from Sweden), 17-19 years of age, participated in the study. By now are 3 papers are accepted, 2 submitted and 4 under preparation. One attachment to a Swedish Governmental Committee SOU 2004:7, an International report and contributions to two books has also been written so far. The project has given new knowledge on several areas concerning commercial child exploitation, children’s disclosures of sexual and young perpetrators of sexual abuse. The study has been much appreciated on the international arena.

EXPERIMENTAL BRAIN RESEARCH
Mechanisms of cell death following brain injury: We have identified the mitochondria as an important target for brain injury therapy. One company has been founded. Mild hypothermia is effective in preventing brain damage.
We are identifying critical mechanisms of this protection. One company has been founded. Clinical trials are in progress.

CLINICAL NEUROPHYSIOLOGY
Continuous brain monitoring in the sick neonate. An Atlas on the subject has been published and a second edition is in press during spring of 2008. The technique was carried to adult patients after cardiac arrest and during hypothermia treatment, and the first results from the group was recently published in Intensive Care Medicine. The group has been invited to participate as investigators in a EU multicenter study.

LOGOPEDICS, PHONIATRICS AND AUDIOLOGY
The unit has a long and very productive tradition of research in developmental language disorders. Recently, this program had been extended to cognitive and linguistic functions in children with cochlear implants. Another focus has been on speech motor control. In all these areas, the unit has a very strong international standing.

NEUROSURGERY
Neurooncological research. Immunotherapy, focusing on glioblastomas with immunisation with tumour cells, transfected with interferon gamma, demonstrates good experimental results.
Within the Rausings Laboratory for translational neurooncology, the Brain Immuno Gene Tumour Therapy group (BRIGTT), animal results have been translated into a treatment model for patients with glioblastoma multiforme. With successful results with prolongation of life of about 80% the group also performs differential serum protein profiling of GBM patients immunized with autologous glioma cells transfected with the IFN\(\gamma\) gene, and their controls and compares mRNA and protein expression profiles in glioblastoma multiforme. In parallel, the Glioma ImmunoTherapy group (GIT) runs a series of animal studies to find new and improved techniques to translate to the human situation. More immunostimulatory cytokines and genes are tested. GM-CSF transfected mouse glioma cells (GL261-GM-CSF) have been established to be used for immunotherapy either alone or in combination with recombinant IFN-\(\gamma\). The section for Cancer Cell Biology identifies signaling pathways for glioma initiation and progression.
The Stem Cell group study the possibilities to utilize exogenous stem cells as therapy for malignant glioma. The translational project BRIGTT is still unique in the world. It is a demanding procedure and before we started as the first center to perform this treatment, an international board of immunologists, pathologists and neurooncologists evaluated our possibilities to drive the project and found that all aspect were covered in our center. Our results are still unique with a prolongation of life with 80% of the patients (all above 50 years of age) and with good QoL.

NEUROLOGY
Cell transplantation in Parkinson’s disease: We have pioneered the field of cell replacement for brain disorders. Our studies have demonstrated that grafted dopamine (DA) neurons can survive, reinnervate the striatum, restore DA release, and induce clinical improvement for up to 10 years despite an ongoing disease process, which destroys the patient’s own DA neurons. We are currently trying to generate large numbers of DA neurons from stem cells.
Gene therapy in Parkinson’s disease: We are trying to develop long-term delivery of the neurotrophic factor GDNF using gene therapy as a novel strategy for patients. Human cell lines secreting GDNF are generated and encapsulated in polymer-based hollow fibers. Patients will then be implanted with capsules in the putamen, and assessed clinically and with serial PET scans.
Cell transplantation and neurogenesis in stroke: Our discovery that the adult brain makes an attempt to repair itself after stroke has triggered studies in many laboratories. We are now studying the mechanisms of neurogenesis to identify clinically applicable strategies to potentiate the degree of functional restoration. We are also generating cortical and striatal neurons from stem cells for transplantation into the stroke-damaged rodent brain.
Clinical stroke research: We have pioneered epidemiological studies, large clinical trials, diagnostics, and pathophysiological and neuroimaging correlative studies across several decades. The Lund Stroke Register, a population based stroke epidemiological study established 2001, is one of only a handful of such registers currently on-going world-wide. Data from the register (currently about 3000 patients and 1000 healthy controls from the general population) have been used for monitoring of incidence trends and long term outcome studies including multidisciplinary approaches (nursing, physiotherapy). More recently, the data base has also been used for studies on stroke genetics.
OPHTHALMOLOGY
Retinal degeneration: Mechanisms and experimental therapy. Pathophysiology in blinding retinal diseases such as Retinitis Pigmentosa and glaucoma, is investigated. The studies utilize various animal disease models, both in vitro (retinal explants) and in vivo, and have recently revealed novel components of the mechanisms behind the irreversible cell loss in inherited retinal degeneration. Based on such findings, experimental therapies are developed, using a range of factors, enzyme inhibitors and other molecules. Knowledge of the degeneration mechanisms and experimental assessment of various treatments are both essential for the advance of efficient protective therapies for these diseases.

Effects of ischemia on the neuroretina. Retinal ischemia ensues when the retinal circulation is insufficient to meet the metabolic demands of the retina. The project aims at identifying the signal transduction pathways that are of importance for the development of retinal ischemic injury and neovascularisation. By pin-pointing the signal transduction pathways involved, we hope to discover a novel therapeutic target for the treatment of retinal ischemia.

Electrophysiology. Further development and introduction of new electrophysiological technique (full-field ERG, mfERG and mfVEP), for investigation of the patophysiology and visual function in retina and the optic pathway. This technique could enhance the understanding of the pathogeneses and the clinical variation in families with hereditary eye disorder and in retinal impairment caused by drug toxicity could be verified. The Swedish RP register including 2600 patients with retinal degeneration and a Biobank counting DNA from 1200 patients is including in this research.

GERIATRIC PSYCHIATRY
Characterize functional brain network in healthy subjects and examine how brain damage in different dementia syndromes affect cognitive functions.
Analyze and link brain cellular/tissue changes (neuropathology) with brain imaging in dementia patients.
Study personality characteristics and affective status in relation to cognitive performance, experience of stress and biological markers of stress in a longitudinal design in patients with memory complaints.

PSYCHIATRY
Electroconvulsive seizures. Findings of altered cellular plasticity in our preclinical studies, elucidate possible mechanisms of action of this important treatment regimen. Internationally recognized. Translational studies into the clinic have been introduced.
On the psychobiology of suicidal behaviour. Studies (body fluids, challenges, brain-imaging) on the role of monoamines and the stress system for deliberate self-harm. Known internationally. Several postdocs and PhD students are involved.
Comorbidity studies on alcoholism. Recognized in Nordic countries.

REHABILITATION MEDICINE
A well-equipped neuromuscular research laboratory has allowed studies of molecular changes following various rehabilitation interventions, which, combined with evaluations using global outcome measures, provide unique opportunities to assess the effects of rehabilitation from cellular function to social interactions. Qualitative research has expanded our knowledge of the effects of goal-oriented, comprehensive interdisciplinary rehabilitation programs, and this has lead to the development and strengthening of new interventions for people with life-long physical and cognitive disabilities.

OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY
In studies on allergy there is a close co-operation with dept immune technology at the Technical faculty, which has led to development of new methods as well as registered patents and products being made commercially available. In studies of balance control there is a longstanding co-operation with dept of Control Theory at the
technical faculty, which has led to some of the cornerstone publications of human postural control. The work has been reciprocal and human behavior has been inspiring understanding of robotic control and vice versa. The work has resulted in several therapies and diagnostic methods, as the present low dose gentamicin therapy for incapacitating Meniere’s disease, which today is the most spread and used method. Recently, a completely new approach has been introduced, the ‘prehabilitation’ i.e. a pretreatment method to reduce morbidity and avoid permanent invalidity after certain neuro- and skull base surgery. Most patients with head and neck squamous cell carcinoma in southern Sweden are treated at the department and tumour samples are continuously retrieved for research. For more than 30 years a nude mice model for cultivating cell-lines of tumour cells has been running and their original patient donours have been followed, forming a unique material. The work is done in close co-operation with the oncologists. Otitis media is one of the most common childhood diseases and its course, therapy and prevention are studied both in animal models and in clinical studies, including a vaccination program. Sleep apnoea and related disorders are studied. New concept of diagnosis and treatment has been developed and the group leader has been acknowledged as a member of the International and EU-funded validating board for dept in sleep-disorders.

Section V

CANCER EPIDEMIOLOGY
ICRU (International Commission on Radiation Units and Measurements): Definition of a specific terminology by international working groups. Decisive input from Lund.
Scandinavian Sarcoma Group (SSG): A multinational database exists, which is used for tumour biology, epidemiologic and prognostic studies, contains detailed clinical-pathologic, treatment and follow-up data.
Nordic Childhood Cancer Survivor Cohort: Based on pooled data from all five Nordic cancer registries the risk of SMN in survivors, risk of cancer in first-degree relatives, and causes of late mortality have been investigated.
Collaborative Group on Hormonal factors and Breast Cancer: Meta analyses have been performed on the risk for oral contraceptives, HRT, alcohol, family history, abortions, pregnancies. Our department is participating both with a case control study and the big MISS cohort.
Collaborative Group on Epidemiological studies of Ovarian Cancer: Meta analyses have been performed on the protective effect for oral contraceptives, and pregnancies. Our department is participating with the big MISS cohort.
GenoMel (Melanoma Genetics): The project, first aimed at study the role of CDKN2A germline mutations, has evolved into finding new melanoma genes through a genome wide search among families with melanoma cases, individuals with multiple melanomas or among individuals with a melanoma diagnosis before age 40.
EUROCARE: Concerted action by at present 67 cancer registries in 21 countries in Europe. Analyses of age-standardised five-year relative survival, special studies on specific tumour groups.
BRCA-1 and 2 International Collaboration including work within the Breast Cancer Linkage Consortium and the IBCCS cohort: A high risk registry has been established to facilitate studies of follow-up of high risk patients attending the oncogenetic clinic.
SWENOTECA (Swedish-Norwegian Testicular Cancer Project): Based on pooled data from the SWENOTECA data bank from Sweden and Norway survival data have been investigated.

CLINICAL PHYSIOLOGY
The Cardiac MR Group; the group has during a short period reached the international front through studies of basic cardiac physiology and various cardiac diseases using the latest magnetic resonance techniques and in-house developed mathematical post-processing algorithms in collaboration with Dept. of Applied Mathematics. The cardiac pump mechanism is studied at a level which will alter our view on physiology, pathophysiology and diagnosis.
The EKG group. EKG is the leading physiological diagnostic method in a global perspective. EKG analysis has been refined through technical and mathematical developments. Our unit pioneered computerization of EKG at rest, stress and 24-hour recording, and now continues with international collaboration with USA and the technical faculty at Lund University. The main focus is to improve EKG for detection of acute coronary syndrome.
The Lung group follows three lines: The constantly upgraded lung function laboratory is a national resource for advanced lung diagnostics; tomographic lung scintigraphy has reached an internationally leading position in lung diagnostics. Quantification of pulmonary embolism enables home treatment to benefit of patients and at low cost
research in patients with critical lung disease is based upon the world leading Siemens ServoVentilator, originally conceived by Jonson. Methods are developed in animal research and applied in international centres for optimizing ventilator settings to minimize treatment induced lung damage.

**DIAGNOSTIC RADIOLOGY**

The key research area is neurofunctional MRI in a broad sense (combinations of morphology, perfusion, diffusion, fMRI and MR spectroscopy). Here, the department have an over 20 year long tradition in internationally competitive research. In close cooperation with Medical Radiation Physics, the main research areas are:

- **Microcirculation:** Optimal imaging parameters, contrast agents and doses used in dynamic susceptibility contrast (DSC) MRI for perfusion studies at 3T are determined, and accurate mathematical algorithms for calculation of perfusion parameters are developed. Non-invasive arterial spin labelling (ASL) methods for 3T are developed and compared to the DSC method. Routines for functional cortical activation (fMRI) investigations are optimized at 3T with emphasis on examinations of the whole fMRI data chain. MRS is investigated e.g. for differential diagnosis. Clinical impact is evident e.g. for patients with acute lacunar stroke and brain tumors, as well as for neurosurgery planning in tumor patients.

**MEDICAL RADIATION PHYSICS**

- **Systemic Radiation Therapy:** Developing quantitative molecular imaging with main focus on therapy applications in oncology for systemic radiation therapy. Disseminated cancer will have good possibilities of being treated with targeted radionuclide therapy (TRT). As radionuclide therapy treatments (RNT) are expanding, present dosimetry needs to be replaced by better 2D and 3D quantification methods and more realistic geometrical considerations on the tissue and cellular level. To enhance the therapeutic ratio the pharmacokinetics needs to be manipulated to reduce the normal tissue exposure.

- **MRI:** For perfusion, optimal imaging parameters, contrast agents and doses used in dynamic susceptibility contrast (DSC) MRI for perfusion studies at 3T are determined, and accurate mathematical algorithms for calculation of perfusion parameters are developed. Non-invasive arterial spin labelling (ASL) methods for 3T are developed and compared to the DSC method. Routines for functional cortical activation (fMRI) investigations are optimized at 3T with emphasis on examinations of the whole fMRI data chain. Diffusion information about extra- and intracellular water by diffusion measurements is pursued using the high field gradients and SNR available at our 3T systems.

- **Radioecology:** Studies of actinide elements from different sources. Advanced techniques are used, such as alpha spectrometry and Accelerator Mass Spectrometry. Retrospective studies of Rn exposure in houses. A technique has been developed to retrospectively assess the Rn exposure in a house using deposition of Rn-daughters on glass surfaces followed by alpha spectrometry. It has then been possible to evaluate the Rn exposure to people and relate doses to lung-cancer frequency.

**BIOMEDICAL ENGINEERING**

- **Medical Ultrasound:** Since Lund University has a long and successful history in the area of medical ultrasound (pioneering work in echo-chardiography was performed here by Hertz and Edler), this is the most important research area with impact both nationally and internationally. Through close collaboration with research groups at the Dept. of Electrical Measurements, Lund Institute of Technology, where ultrasound is one of the most important research areas, a wide understanding for possibilities and applications is at hand.

**OBSTETRICS AND GYNECOLOGY**

- **Development and evaluation of new fetal surveillance methods:** The perinatological team developed and evaluated several methods that today are used in clinical obstetric practice. Doppler velocimetry of umbilical, fetal and uteroplacental vessels is the most reliable method for surveillance of growth restricted fetuses, is very important in management of complicated pregnancies at very early gestational age. The management protocols are supported by long-term follow-up studies (up to 22 years of age). Fetal ECG is an important addition to the cardiotocography used for fetal surveillance in labour. Estimation of Cystatin C levels in maternal blood is a good indicator of maternal renal function in preeclampsia. In the field of doppler ultrasound in obstetrics, Lund is one of worldwide leaders.

- **Epidemiological studies of perinatal factors:** The results supported the national changes in management of breech pregnancies, initiated several prospective studies on perinatal acid-base balance, ultrasound dating and investigation of fetal growth.
Studies of the role of oxytocin and vasopressin in human reproduction give basis to development of oxytocin antagonist atosiban, now commercially available and used worldwide in cases of imminent preterm labour as an efficient tocolytic agent with practically no side effects.

**ONCOLOGY**

We have strong research in genetic susceptibility for breast cancer and maintains an oncogenetic analysis service in Sweden (BRCA1 BRCA2 mutation screening). This represents an example of a successful clinical implementation of research activities – genetic linkage and BRCA gene analysis in familial breast cancer started as research projects in the early 90ties and grown to national diagnostic service. The group is participating in large international genetics consortia for association studies in breast cancer and malignant melanoma. Another example of clinical implementation is the use of prognostic and treatment predictive factors in the management of breast cancer patients.

Research regarding early diagnostics and photodynamic therapy (PDT) of malignant tumours. PDT has been taken from laboratory work to routine clinical application regarding certain types of skin carcinomas, while interstitial PDT is now being studied for prostate cancer.

Clinical trials in lymphoma – coordinating more trials and recruiting more patients than any other centre in Sweden. Pioneers in radioimmunotherapy for lymphoma – first in Europe. The Swedish-Norwegian testicular cancer project, SWENOTECA is a binational clinical research collaboration which started 1981. Several clinical trials, (SW I-VII) have outlined the treatment of testicular cancer in the two countries. The impact of SWENOTECA is reflected in repeated Eurocare surveys of cancer survival in Europe. In focus today is research on late effects of cancer treatment as fertility, hypogonadism and cognitive function.

To improve tumour targeting of immunoconjugates, this requires reduction of the fraction of uptake in sensitive vital organs, improving penetration through interstitial tissues, and evaluation of the internalization process in the tumour cells. We have evaluated a specific device to improve tumour-to-normal tissue in these animals and implemented various devices and strategies in clinical phase 1-2 studies ECAT.

Collaborative Groups on Hormonal factors and Breast Cancer, Epidemiological studies of Ovarian Cancer, GenoMEL (melanoma genetics and BRCA-1 and -2 International Collaboration, including work within the Breast Cancer Linkage Consortium and the IBCC cohort. The role of CDKN2A germline mutations has evolved into finding new melanoma genes through a genome wide search among families with melanoma.

**PATHOLOGY**

Neuropathology group: Analyses of tissues from human GBM and animal models with respect to histopathological parameters and gene expressions.

Cellular imaging group: Determination of antibody internalization in tumor cells by combined flow cytometry, confocal microscopy and electron microscopy.

**PEDIATRICS**

Pediatric nephrology: The productive research focus on haemolytic uremic syndrome and vasculitis, noticed nationally and internationally.

Pediatric cardiology: With a fruitful research environment, achieving publications in high-ranked journals and also major grants.

Neonatology: Studying questions of early diagnostic methods for perinatal brain damage, both in animal experiments, clinical setting and in basic science. Major fundings and the clinical research, in addition to diagnostics, aim at finding early interventions for improving cognitive function. Furthermore, a laboratory for diagnostics of mitochondrial disorders is under development (not only GRACLE sdr), but more general possibility to assess respiratory chain deficits.

Child oncology: Collaboration with the Stem Cell Center has been fruitful. Furthermore, collaboration between Lund and the Netherlands has been established. Long-term follow-up of leukaemia patients is ongoing.

**SURGERY**

Pancreatology: Pancreatological research involving both pancreatic cancer and acute pancreatitis, ranging from in vitro, in vivo, and clinical studies, involving molecular mechanisms, clinical trials, and novel intervention. The acute pancreatitis research is well established, involving cellular mechanisms, effects on the pancreas and concomitant systemic inflammatory response and potential development of multiple organ dysfunction. Studies have also included clinical outcome and randomized trials on nutrition. The Lund group has national and international frontline standing with networks in Scandinavia, Europe and Asia.
Endocrine surgery: Has a good academic tradition in Lund, one of the leading groups in Sweden, not at least the research associated with hyperparathyroidism. The research has resulted in development of novel and less invasive modes of endocrine surgery like unilateral exploration in hyperparathyroidism.

Upper GI surgery: Surgical technique development, quality control and improvements in management of patients with gastroesophageal reflux disease are areas where Lund stand among the top three departments in Sweden. This concerns not at least the clinical esophageal cancer studies continuously ongoing in Lund.

Abdominal adhesions: Abdominal adhesions and operation due to intestinal obstruction is a substantial resource-requiring part of general surgery. A specific concept has been developed including differently charged polypeptides which repeatedly have been demonstrated better than all existing alternatives, and developed to a very active research field. The concept still requires additional research, toxicology studies etc, but is well on its way to potential clinical use.
2.4 Description of most promising research areas or research directions in the department, incl. areas you would like to see develop in the next 5-10 years and actions you consider necessary to allow this development

Sections I-II

EMERGENCY MEDICINE
Important projects: a) Risk factors for cardiovascular disease are known, such as high LDL, hypertension and smoking, but how do they at the molecular level modify receptor regulation. b) Stroke induces upregulation of contractile receptors in the ischemic region. By blocking the transcription/translation of these receptors we have found that the neuronal death is reduced and the infarct volume smaller. This will be taken into the clinic within a short time. c) Primary headache disorders. The neuronal messenger CGRP was discovered in the perivascular nerve network and this has now resulted in a new medication which is tried in Phase III trials. d) Cardiovascular disease. We have as first in the world demonstrated that G-protein coupled receptors upregulate (increase in number) in coronary ischemic disorders. By controlling this process we believe that this will result in novel therapy.

ANAESTHESIA AND INTENSIVE CARE
Research on effects of cooling after acute cardiac arrest. Research to find neuroprotective substances after neurotrauma, to clarify mechanisms behind brain oedema development and to improve general outcome for these patients. Research to use antimicrobial peptides for clinical use. Research to improve outcome in septic patients by stabilization of general hemodynamics. Research in the unusual and genetic disease malignant hyperthermia.

CARDIOLOGY

RESPIRATORY MEDICINE AND ALLERGOLOGY
In the asthma field there is an increasing need to develop new insight in the inflammatory events, especially in the peripheral lung tissue, as still about 50% of asthmatics don’t reach good control of their disease with current treatment. To combine invasive and non-invasive measurement to study disease mechanisms will give new knowledge for phenotyping the patients. In COPD we focus on further characterize the disease also with focus on peripheral airways, to hopefully find new targets for intervention. The knowledge about autoimmune mechanism and continuing inflammation after smoking cessation will make these efforts more important.

MEDICINE
Clinical connections and patient studies can be improved by new and improved patient registers, hopefully common for Lund and Malmö. International collaboration in particular within EU projects and networks should be more emphasized. Collaboration with China is already ongoing and is expanded.

MEDICAL ETHICS
Ethics and risk will be in focus the next 5-10 years. An example is nano-medicine (or nanotechnology). There are a number of interesting risk question that have to be discussed and these questions all have interesting ethical connotations. Another area is medical decision making, risk taking and ethics.
NEPHROLOGY
Integrative physiologic research - Translational research on microalbuminuria. Recruitment of new collaborators is crucial. The development of a technique based on tracer doses of FITC-Ficoll for measuring glomerular permeability in humans will be critical.
Effect of ACTH on glomerular protein leakage in membranous nephropathy - It would be of great interest to extend the human studies performed to animal models of membranous nephropathy.
Vasculitis research - We plan to address our hypothesis about the etiology of small vessel vasculitis more directly. Present studies aim at identifying clones of neutrophils, monocytes or precursors to such cells, with changed structure and function. When sufficient amounts of cells from such clones can be separated, that will allow comparison of global mRNA expression by gene arrays or global protein expression by proteomics.

THORACIC SURGERY
Due to insufficient techniques and inferior preservation solutions, the time from harvesting of a human heart to transplantation today is 4-5 hours. This short time frame puts sharp limits on the accessibility of donated human hearts. New techniques and preservation solutions for prolonged heart preservation for more than 24 hours have been developed in a pig model and will be introduced in the clinic within short. Our research also gives new insights in the management of brain death. Revolutionary techniques are under development for optimizing donor hearts that today are rejected or not considered as suitable for transplantation.

Section III

DERMATOLOGY
We are organizing a Skin Health and Research Center (SHRC) combining innovative research at BMC with clinical research at the University Hospital. Existing collaborations with other research laboratories and the pharmacological industry in Europe and US will be extended and broadened.
Development of new therapies for infectious, inflammatory and allergic skin diseases based on development of new molecules related to modified endogenous compounds.

INFECTION MEDICINE
The unravelling of molecular mechanisms behind vascular leakage in severe infectious diseases, the identification of novel innate immune mechanisms, and the recent discovery of bacterial enzymes that inactivate disease-inducing antibodies, all represent major scientific break throughs with considerable future potential.

RHEUMATOLOGY
The vision is to extend the translational approach with extensive interactions between clinical and basic research activities. The possibilities for extended international collaborations are great. The obstacles include difficulties in recruiting young rheumatologists particularly those that are willing to devote themselves to basic research work combined with clinical training. Recruitment efforts include early contact with graduate students and creation of attractive post doc positions, and positions for visiting scientists.

Section IV

CHILD AND ADOLESCENT PSYCHIATRY
The unit ought to plan for a research centre in the region. The center should both perform research of international high standard but also support the development of different clinical project within child and adolescent psychiatry and social work in the southern region. Initial contacts with the county council members of Region Skåne have been taken.

EXPERIMENTAL BRAIN RESEARCH
Studies on recovery of brain function following brain injury will provide the next generation of stroke therapeutics. This involves studies of recovery of function of surviving neurons and of scar formation where a strong development can be expected within the next 10 years. By massive gene profiling we have identified three
processes involved in the recovery process that could be developed into new interesting research areas. We envisage an industrial development within this field.

**LOGOPEDICS, PHONIATRICS AND AUDIOLOGY**
The research programs on developmental language disorders and on children with cochlear implants will continue to be strong. A concentrated effort is required to provide a better coupling between teaching and research in audiology by hiring staff members with stronger background in research. Research on voice disorders has recently received external funding and will form another focus area in the division.

**NEUROSURGERY**
The neurooncological research area will probably continue to be the strongest, with large resources both concerning economy and staff. The poor diagnosis of malignant glioma motivates concentration of resources to a limited number of centres with researchers including both basic sciences and clinical activities, thereby allowing novel ideas and potential therapies. Not until recently, therapeutic results have appeared that imply that finally therapy makes a difference. We now start to feel a reasonable hope that by intensified efforts, the improved therapy will turn into *cure* within a not too remote future.

**NEUROLOGY**
Development of stem cell-based approaches for Parkinson’s disease patients - We will generate large numbers of DA neurons in standardized preparations suitable for transplantation, test them in animal models, and apply them clinically.

Development of stem cell-based therapeutic approaches for stroke patients - We will generate neurons and glia in culture and clarify mechanisms of neurogenesis from endogenous stem cells, optimize the magnitude of behavioural recovery after cell therapy in animals, and then start clinical trials.

Development of gene therapeutic approaches for epilepsy patients - We will deliver neuropeptides using viral vectors and encapsulated cells with the aim to dampen epilepsy, first in animal models and then in patients.

Stroke genetics - Lund Stroke Register is a founding member of the International Stroke Genetics Consortium (ISGC; http://strokegenetics.org) established 2007. ISGC is led by the BROAD Institute of MIT and Harvard with 19 contributing centres from USA, UK, Poland, Germany, China and Sweden. The main aim is to perform the first genome-wide genetic screening in 30 000 patients with stroke and 10 000 controls.

Stroke epidemiology - The Lund and Malmö registers cover a population of about half a million people, i.e. several-fold the population of most other ongoing epidemiological registers. Swedish health care registers have the advantages of large patient groups, comprehensive data collection, and possibility of cross-lining with several other official registers (population register, Statistics Sweden, hospital registry, pharmacy register).

Acute stroke therapies - Lund has, as the only hospital in the region, the full facilities of a comprehensive acute stroke centre with the potential to play a leading role in development of advanced acute stroke therapies.

Cognitive effects of neurological diseases - Development of closer links between the dementia research groups at the Divisions of Geriatric Psychiatry and Neurology would give unique opportunities to high quality research in this field.

**GERIATRIC PSYCHIATRY**
To identify specific CSF biomarkers for identification of the more unusual dementias. To use multiple MR imaging methods; DTI, DTT, volumetry, MR spectroscopy to characterize metabolic and regional neurodegenerative changes. To identify unknown genes with relevance to dementia and to describe the molecular mechanisms involving these genes.

**PSYCHIATRY**
Not at least the shirt of generation emphasizes the need of more academic positions to improve psychiatric research. This includes positions as professors in neuropsychology and general psychiatry. The situation for the Lundby study is precarious, as an expert leader is needed. Concerning mood disorder research, innovative studies will continue by several researchers. Studies on psychotic disorders will move into the field of forensic psychiatry, which is expected to expand.

**REHABILITATION MEDICINE**
One of the most promising research areas is of the effects of various rehabilitation interventions, pharmacological as well as non-pharmacological, that may influence cellular (brain, spinal cord and muscle) plasticity and improve functioning and reduce disability. The other is on the effects of rehabilitation on behavior, cognition and
emotions in people with life-long disabilities, factors that are closely linked to the successful outcome in the form of enhanced societal participation and life satisfaction.

SECTION V

CANCER EPIDEMIOLOGY
Collaborative research between cancer registry, quality registries and biobank registries in a population based setting for optimization of cancer care.
Further development of population based cohort studies such as the MISS study to allow complete life time follow-up for different exposures.
Improved utilization of cancer registry data matching inpatient and outpatient registries, insurance registries etc in order to better quantify cancer care.
Using registry data to find new familial cancer clustering for GWS studies.

CLINICAL PHYSIOLOGY
Promising directions for the future are functional and molecular imaging of normal physiologic and pathophysiologic processes. We work with several imaging modalities both in research and clinic; ultrasound, positron emission tomography (PET) in combination with CT (PET-CT), single photon emission computed tomography (SPECT) and magnetic resonance imaging (MRI). Further development of multimodal Cardiovascular Imaging integrating EKG, MRI, SPECT and PET is promising.
In lung research, our system for tomographic lung scintigraphy is an internationally recognized platform for studies of regional ventilation/perfusion relationships. One goal is to perform international studies aiming at individual treatment of pulmonary embolism on the basis of scintigraphic quantification and follow up.
Fenotyping COPD will be essential for understanding of the disease enabling individualised treatment. We will combine CT and SPECT imaging with comprehensive lung function tests at rest and exercise.
Integration between imaging and other functional tests is essential. Continued internationalization is a prerequisite for recruitment of both top level researchers and research students as well as for funding of our activities, as is cooperation with pharmaceutical industry.

MEDICAL RADIATION PHYSICS
During the next 5 years our aim it to pursue ultra-high field MRI and fused imaging techniques, primarily MR/PET. Ultra-high fields (7T and above) for human use shows remarkable potential in the context of morphological/anatomical detail as well as regarding increased contrast in functional MRI. Furthermore, the combination of MRI and PET will combine functional imaging with molecular imaging, utilize new development of nano-particle based contrast agents and be of significant impact e.g. in future individually designed cancer treatment. Both of these aims are covered in our five-year vision, the buildup of Lund Bioimaging Center (LBIC). Regarding radioecology, the strategic planning is developing sensitive methods for radionuclide analysis with special application mass spectrometry. Apply these methods to environmental studies and kinetics of elements in man using long-lived isotopes as tracers.

BIOMEDICAL ENGINEERING
Tissue analysis by using ultrasound is an important area that will be focused on the next coming years.
Besides the continuation on the Medical Ultrasound area, Patient Security and Safety using Medical Technical Devices are of great importance in the future. Plans for a broad collaboration with a number of actors, from both the University and the University hospital, has been drawn recently. A present closeby project deals with a new flexible cordless patient alarm system, which will improve the contact ability and surveillance of patients with these special needs. It is to be used both in hospital and residential environment.

OBSTETRICS AND GYNECOLOGY
- Studies of pathophysiology of preeclampsia including genomic and proteomic investigations of the placenta, biobanking of placenta tissue, maternal and umbilical cord blood. Development of new diagnostic and prophylactic strategies.
- Epidemiological studies over several generations in association with biobanks to study the genetic and environmental factors contributing to complications of pregnancy with their consequences for the outcome, both in short and long perspective.
- Technical development of 3-dimensional ultrasound technique for volume estimation of fetal body for better fetal weight estimation and prediction of growth restriction or macrosomy.
- Development of a better method, possibly based on 3-dimensional Doppler ultrasound, for quantitation of fetal volume blood flow.
- Establishment of new ultrasound methods for studies of pelvic floor and urethra function with aim to improve the repair of obstetric injuries and to limit their long-term consequences.
- Further studies on possible paracrine effects of oxytocin and vasopressin and development of more specific receptor antagonists to be used in the treatment of preterm labour.
- Further studies on pericellular proteolysis as an activator of cell migration, two functions that lead to cell invasion, with aim on developing a marker that could be used for screening for gynecological cancer.

**ONCOLOGY**
- Targeted therapies of cancer - A major goal of cancer research is to improve the specificity of drugs for cancer cells. “Targeted” could have several meanings, e.g. cancer cell-specific delivery of a cytotoxic substance, or non-specific delivery of a substance that targets a pathway that is essential for cancer cell survival while dispensable for normal cells. Ideally, therapeutics of cancer offers a combination of both, which is a major objective of our research. To individualize the use of targeted breast cancer therapy, we will evaluate predictive factors in blood and tissue samples from patients participating in clinical trials in relation to treatment effects.
- Developments of unconjugated and conjugated immunoconjugates for therapy; new radiolabeled tracers for PET-investigations/therapy prediction. To visualize and follow biochemical processes.
- Prediction of early response to therapy making it possible to early change strategy of therapy.
- Carry out academic clinical trials in cooperation with other departments at Lund University hospital, including research departments for collaboration with translational research. With the start of the phase I unit it will be possible for new treatments developed in conjunction with research departments to be investigated.
- Studies of the joint effects from lifestyle, concomitant medications (including complimentary alternative medicine) and genotypes on 1) response to oral contraceptives and risk for subsequent breast cancer, and 2) response to breast cancer therapy.
- Using registry data to find new familial cancer clustering for GWS studies in order to identify new genes of Importance for cancer predisposition.
- Biomarker studies of blood in breast cancer to identify markers for risk, diagnosis and follow up (such as protein arrays and galectin expression).
  * Developing methods for predictive analysis of targeted therapy in malignant disorders, e.g. breast cancer and lymphoma.
  * Optimizing therapy for testicular cancer – with minimization of long term adverse effects.

**PATHOLOGY**
Tight localization of spaces and resources of technology and personnel for advanced morphology and histopathology to create an improved scientific milieu. Creation of a core facility for advanced morphology and histopathology would be of an enormous benefit for improved connection of basic and clinical research. Today, advanced morphological skills are under-evaluated by strategic authorities, although there is a very strong need from different groups of excellence for such facilities.

**PEDIATRICS**
Recruitment of young researcher to the most successful groups is of critical value for the further development within the identified strong fields of pediatric research (nephrology, cardiology, neonatology), and improved collaboration within the university, e.g. neurosciences and stem cell research.
There is a need for new professors of pediatrics, thereby further enforcing research. Collaborative research aiming at developing a diagnostic center for respiratory chain disorders serving the Öresund region has been taken.

**SURGERY**
Promising research areas for the future are:
Organ dysfunction specifically focusing on the epithelium – Multiple organ dysfunction is frequently a complication in abdominal disorders like acute pancreatitis, intestinal ischemia, or postoperative complications. Abdominal adhesions – a rapidly developing field of complete novelty value and large potential clinical impact. Pancreatic cancer - Multiple interventions in order to control proliferation and growth of pancreatic cancer and by increased knowledge also individualize treatment, also in the palliative treatment setting. Cooperation exist with networks nationally, a Scandinavian network (HPB), and also collaboration with Fudan University, Shanghai, improving both experimental and clinical studies.

Technical development in surgery - Development of surgical methodology not at least in upper gastrointestinal surgery, liver surgery, endocrine surgery, recently also involving robotic surgery. Logistics and enhanced recovery after surgery, introduction of a perioperative registry for all surgical patients and enteral administration of multiple compounds prior to surgery in order to downregulate the postoperative inflammatory response, increase gut barrier integrity and motility, and minimize metabolic alterations induced by major abdominal surgery. This will have immediate impact both on clinical research, but also on quality of care, shortening hospital stay and complications.
2.5 List of publications which best represent the research activity.

Rundgren M, Rosén I, Friberg H. Amplitude-integrated EEG (aEEG) predicts outcome after cardiac arrest and induced hypothermia. Intensive Care Med 2006;32:836-842. This study shows that outcome after cardiac arrest as analysed under hypothermia can be predicted with high significance from EEG registration.


Rosengren B-I, Rippe A, Rippe C, Swärd K, Rippe B. Transvascular protein transport in mice lacking endothelial caveolae. Am J Physiol 2006;291:H1371-H1377. It is very hard to pick just one reference, but this paper may forever change the view on the transport of macromolecules across microvascular walls. The paper has been selected by Faculty 1000 as one of the most influential in the area at present.


particular, it serves as a landmark, since it is one of the few cross-linguistic studies of language impairment. It shows that research on Swedish children with language impairment is a significant part of international research within the field.


The SALT Collaborative Group. The Swedish aspirin low-dose trial (SALT); A randomized, placebo-controlled study of 75 mg aspirin as secondary prophylaxis after TIA or minor stroke. Lancet 1991;338:1345-1349. [Corresponding author: Bo Norrving].

The SALT study is the pivotal trial on low dose (75 mg) aspirin in secondary stroke prevention. It is a citation classic, and was included in Vintage Papers from the Lancet published 2006 by Elsevier, a facsimile edition of the 212 most important publications in the history of The Lancet since its start 1823.


These data provide evidence that grafted neural progenitors can differentiate into morphologically mature pyramidal projection neurons, and become functionally integrated into host cortical circuitry.


This study underlines the importance of temperament rather than conventional diagnoses for suicidal behaviour.


The largest randomized clinical trial on fetal surveillance in labour evaluating a new clinical method – automatic analysis of fetal ECG waveform. The results were important for implementation of the method in clinical obstetric praxis.


2.6 List of publications which best represent renewal of research activities.

Ansar S, Edvinsson L. Subtype activation and interaction of protein kinase C and Mitogen-activated protein kinase controlling receptor expression in cerebral arteries and microvessels after subarachnoid hemorrhage. Stroke 2008;39:00-00.


In this paper high molecular weight Ficolls are used to mirror changes in glomerular permeability with very high accuracy and precision reflecting glomerular protein permselectivity. The strength of our work lies in the in-depth methodological validation of the technique.

The article describes the first clinical lung transplantation using a rejected lung. The lungs were rejected of all European lung transplantation centres due to bad ability to oxygenate the blood. After an ex-vivo recondition and evaluation of the lung one lung was successfully transplanted into a patient with terminal lung insufficiency.


A completely new concept with differently charged polypeptides was demonstrated to be extremely effective and significantly better than any other alternative. The finding has lead to a number of concomitant publications in the field and active research around this problem.
2.7 List of publications which cannot be defined as Scientific publications but are still important for understanding the scientific development.


The Swedish National Stroke Guidelines are the first in the world to develop a transparent model for priority settings based on scientific evidence, cost-effectiveness and overall impacts of different management and treatment modalities.


Comorbidity has become identified as a substantial problem in clinical psychiatry.


This review has defined a set of statistical techniques to evaluate the reproducibility of measurements in rehabilitation that are widely used in such studies.


2.8 List of important Scientific publications which are not yet included in the Lund University Publications (LUP) database (2003-2007) but which you still regard as essential.


This paper exemplifies the work in the SLE group, which now focuses on detection of genetic linkages to the disease. The epidemiological cohort that has been closely monitored for many years is a prerequisite for these studies.


The study shows that the trend of increasing stroke incidence in the young appears to have plateaued, but despite advances in stroke prevention no overall decline is observed.


The study shows that weight loss after stroke is common and that malnutrition appears to be the main cause. The study illustrates the usefulness of a multidisciplinary approach in clinical stroke research in the Lund Stroke Register.


http://archophth.ama-assn.org.ezproxy.its.uu.se/cgi/content/full/126/1/51

This paper demonstrates new pathophysiological findings according to molecular genetics and electrophysiology for a unique disorder, not previous described.


This is to show that the important Lundby-study is moving on.


The first study that has shown that moderate physical activity regularly performed by old subjects can maintain telomere function and thereby the regenerative potential of skeletal muscle.


An international collaborative pediatric oncology study of expression profiling and pathology in a 110 neuroblastoma tumors identify a new MYCN target.
2.9 Additional sources of information

http://www.med.lu.se/klinvetlund
http://www.med.lu.se/bmc
Form 3. Quantitative summary of research activities and academic reputation.

Department: Clinical Sciences, Lund

Head of Department (submitter): Roland Andersson


<table>
<thead>
<tr>
<th>Activity</th>
<th>Total number</th>
<th>Number of individuals contributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invitations lectures at international conferences</td>
<td>1231</td>
<td>272</td>
</tr>
<tr>
<td>Plenary or Keynote lectures (subset of above)</td>
<td>413</td>
<td>85</td>
</tr>
<tr>
<td>Invitations to organize and chair sessions at international conferences</td>
<td>477</td>
<td>103</td>
</tr>
<tr>
<td>Assignments to research councils or foundations of national or international significance (assignments &gt;1 yr)</td>
<td>157</td>
<td>67</td>
</tr>
<tr>
<td>Assignments as evaluations for lectureships and professorships</td>
<td>199</td>
<td>100</td>
</tr>
<tr>
<td>Assignment as editor or member of editorial boards of national or international journals</td>
<td>540</td>
<td>68</td>
</tr>
<tr>
<td>Number of elected members of academies and learned societies per 2007</td>
<td>211</td>
<td>88</td>
</tr>
</tbody>
</table>

For some large departments these figures can be hard to confirm. Then give an estimate.

3.2 International Collaboration (2003-2007)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Total number of visits, programs or institutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting researchers (scholars and doctoral students) staying for at least 3 months</td>
<td>107</td>
</tr>
<tr>
<td>Research visits (scholars and doctoral students) abroad for at least 3 months</td>
<td>48</td>
</tr>
<tr>
<td>Regular guest research programs with identified individuals (e.g. guest professor programs)</td>
<td>21</td>
</tr>
<tr>
<td>Number of collaborating institutes with joint publications</td>
<td>1555</td>
</tr>
</tbody>
</table>

3.3 Renewal Indicators (2003-2007)
Total number

<table>
<thead>
<tr>
<th>Description</th>
<th>Total number</th>
</tr>
</thead>
<tbody>
<tr>
<td>External recruitments (for positions as forskarass, lecturer, professor) with a doctoral exam from another university</td>
<td>19</td>
</tr>
<tr>
<td>Internal recruitments (for positions as forskarass, lecturer, professor) with a doctoral exam from Lund University</td>
<td>45</td>
</tr>
<tr>
<td>Number of new projects granted from national or international external funds of significance (not less than 500 kSEK)</td>
<td>229</td>
</tr>
</tbody>
</table>

3.4 Interactions with the Society indicating societal relevance of (2003-2007)

<table>
<thead>
<tr>
<th>Description</th>
<th>Total number</th>
<th>Number of individuals contributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governmental / societal assignments of significance (like Governmental Inquiries etc)</td>
<td>123</td>
<td>62</td>
</tr>
<tr>
<td>Text books</td>
<td>173</td>
<td>97</td>
</tr>
<tr>
<td>Popular science papers/books</td>
<td>192</td>
<td>91</td>
</tr>
<tr>
<td>Patents</td>
<td>153</td>
<td>42</td>
</tr>
<tr>
<td>Spin-off companies</td>
<td>27</td>
<td>32</td>
</tr>
<tr>
<td>Adjunct professorships</td>
<td>23</td>
<td>15</td>
</tr>
</tbody>
</table>

If the Department has a strategy for societal influence and interaction, describe it here

The allowed length of this description is max 2,000 characters incl. spaces

3.5 Significant prices, awards etc. (2003-2007)

List name of awarded individual (or group), year, age (for individual) and when rewarded and award name (not research grants etc).

Lars Edvinsson:
- Awarded FAMRI’s first International Distinguished Professor award in the US, may 2007.

Stefan Jovinge:
- Best Basic Science Poser at American Heart Assoc Scientific Sessions in Orlando, Fl USA 2003
- Best Young Scientist award Univ Hosp UMAS 2004

David Erlinge:
- Lars Werkö distinguished research fellowship from the Swedish Heart and Lung Foundation
- Per-Erik and Ulla Schybergs prize
- Jan and Inga Hains Prize

Claes-Göran Löfdahl:
- Jan Rudnik in memoriam Medal for “important contribution to the development of contemporary pulmonary medicine(number 26)

Thomas Hellmark:
- Herbal Thure Carlssons Minne, 2002

Christer Hansson, 60:
- Ellis and Ivar Janzon’s Prize (Swedish Society of Medicine)

Artur Schmidtchen, 43:
- Younger Scientist’s Award, Medical Faculty, Lund University
- Award from the Schyberg Foundation
- Award from the Sandberg Foundation
- Fernström’s Prize for Younger Scientists

Joanna Wallengren, 50:
- Schlasberg’s Prize (Swedish Society of Medicine)

Heiko Herwald, 43 years:
- The Fernström Prize for young and successful scientists awarded by the Medical Faculty, Lund University (2002).

Lars Björck, 58 years:
- The Hilda and Alfred Eriksson Prize awarded by the Royal Swedish Academy of Sciences (2005).
- The Söderberg Prize in Medicine awarded by the Swedish Society of Medicine (2006).

Lars Lidgren:
- The American Academy of Orthopaedic Surgeons. Honorary Member, 2003
- The Royal College of Surgeons of England. Honorary Fellowship, 2004
- The Alpha Omega Alpha, US. Honorary Member, Honor Medical Society, 2006
- La Société Internationale de Chirurgie Orthopédique et de Traumatologie (SICOT)
- Award for important international contributions to the field. Marocco, 2007
- Asian Federation of Sports Medicine (AFSM) and Federation Internationale de Medecine du Sport (F.I.M.S) Thailand, 2007
- Designation of the Department of Orthopaedics, University of Lund, as a Director of a WHO Collaborating Centre for Evidance-Based Health Care in Musculoskeletal Disorders. 2007.

Stefan Lohmander:
- Arthur Steindler International Research Award of the Orthopaedic Research Society (USA) for significant contributions--nationally and internationally--to the understanding of the musculoskeletal system and musculoskeletal diseases and injuries. 2004.
- Marshall Schiff Memorial Lecturer Award of the American College of Rheumatology: “A special lectureship established to address the interface between rheumatology and orthopedics in the area of musculoskeletal medicine”, 2006

Tore Saxne:
- The Wyeth prize for rheumatological research selected by the Swedish Society for Rheumatology, 2006.

Carl-Göran Svedin:
- Awarded the National Pedagogic Price of 2007 from the Crime Victim Compensation and Support Authority.

Olle Lindvall (61):
- Awarded the title “Excellent Researcher” by the Swedish Research Council, 2003
- The Mångberg Prize, Umeå University, Sweden, 2005

Håkan Widner (49):
Bo Norrving (57):
- Honorary Member Hungarian Stroke Society 2007

Malin Malmjö:
- ARVO /Alco early career clinician- scientists research awards 2007

Måns Magnusson:
- The Mångberg Prize, Umeå University, Sweden, 2004

Håkan Olsson:
- San Antonio Breast Conference prize 2003


**Young Investigators Award (third).** Trägårdh E, Arheden H, Pettersson J, Wagner GS, Pahlm O. High-frequency QRS components vs left ventricular mass in humans. Oral presentation at 32nd International Congress of Electrophysiology, Gdansk, Poland, 2005.

**Lund University Hospital Award for Clinical Excellence.** Cardiac MR Group. 2005


Ronnie Wirestam, Freddy Ståhlberg, Bo-Anders Jönsson, Sven-Erik Strand, Michael Ljungberg, Inger-Lena Lamm;

**Leonardo daVinci Award 2004 for one of the three best EU project among 4000 projects in the Leonardo daVinci program for Training and E-Learning**

Katarina Sjögreen Gleisner, 37, 2003:
- The Journal of Nuclear Medicine Alavi-Mandell Prize, monetary award for the article "An Activity Quantification Method on Registration of CT and Whole-body Scintillation Camera Images”.
- Schyberg's stiftelse in collaboration with the Faculty of Science and Faculty of Medicine at Lund University, monetary award for the arrangement of a Scientific Symposium. 2007
Mattias Nickel, 29:
- Research network TESLA, F Ståhlberg coordinator, identified at strong research environment by the medical faculty, LU 2006

Sara Brockstedt:
- Per-Eric och Ulla Schybergs Stiftelse, stipend 2007

Karel Marsal, 2003, 60 y:
- Fellow ad eundem, Royal College of Obstetricians and Gynecologists, UK
- Berndt Kjessler Prize, Swedish Society of Obstetricians and Gynecologists
- American Institute of Ultrasound in Medicine (Honorary Fellow Award)

Jana Brodzski, 2004, 34 y:
- Best oral presentation; 14th World Congress on Ultrasound Obstetrics and Gynecology (Stockholm, Sweden)

Stefan Hansson, 41 år:
- Winner of Innovationsbrons Idéstipendium
- Winner of Öhrlings-Pricewaterhousecoopers/LUAB “Innovationspriset 2007”
- Evy and Gunnar Sandberg Young Investigator Award

Med student Farnaz Malekzadeh 2nd prize young publicists, Läkartidningen (Swedish) Supervisor Helena Jernström

Doktorand Erika Bågeman 1000USD as ACR-travel Award Supervisor Helena Jernström

Hedenfalk, 2003:
- Scholarship from the Torsten Gester Foundation
- Swedish Cancer Society (Cancerfondens pris “Årets canceravhandling 2002”)
- Anna-Greta Crafoords award for the best medical doctoral thesis in Lund in 2002
- Astra-Zeneca-AACR Scholar-in-Training Award (Oncogenomics 2003)

Mattias Belting:
- Hains’ young investigator award, Medical Faculty, Lund University, 2006 and 2007

Katarina Svanberg:
- Fellow, The International Society for Optical Engineering, January 2004
- SKAPA Innovation Prize, Stockholm, October 2004 (jointly with Stefan Andersson-Engels and Sune Svanberg)
- Superinnovator Award, Society for Industrial Development, October 2007.

Thomas Relander and Mats Jerkeman:
- Quality assurance award Lund University Hospital 2004

ISAC XXIII International Congress 24th May 2006, Quebec City, Canada. Ph.D. Student Amir Feredani,
Handledare: Bo Baldetorp

Åke Borg, Carsten Rose San Antonio Breast Cancer Symposium, 2003, Award

Håkan Olsson:
San Antonio Breast Cancer Symposium, Award 2003

Åke Borg, Håkan Olsson and Carsten Rose belong to the 100 most cited and published breast cancer scientists during 20th century.

Elisabet Englund:
- Ulla Carin Lindqvists stipend for ALS, 2006
Diana Karpman:
- Inga och John Hains Prize for medical research 2003, 2004
- Royal Swedish Academy part-time Experimental Research Fellowship 2006-2011
Sections I-II

EMERGENCY MEDICINE

1). Future plans.

We have grants for the next 3 years which will supply our research both at the clinic and the BMC lab facilities. The three major areas are a) risk factors induce receptor upregulation, b) novel treatment in stroke, and c) pathophysiology in migraine. We have been instrumental in advancing a new therapy with a CGRP receptor antagonist which now is in phase III.

The area of cardiovascular research is the main disease area in the clinic and stands for the major mortality and morbidity in the Western counties. It has been in the focus of the faculty for many decades.

2). Collaborations.

We collaborate intensely with the Univ at Copenhagen with many groups. In addition for the CGRP receptor antagonist we have collaboration with Merck, USA.

Within the USiL we collaborate with Neurosurgery and Thoracic surgery clinics, and the Pathology department. Technical collaborations at the BMC, mainly the exp Eye department at house B.

3). We have a lab at BMCA13 in which 10 people work; we have a clinical research facility for clinical trials and experiments at EB block, clinical research department. Besides this much work is done on the wards where we see the patients.

We have all methods available that are necessary to perform the studies; myographs, QPCR, Western, ELISA, immunocytochemistry, confocal microscopy, perfusion myographs, stroke models in animal department at house C, inter alia.

Head of unit: Lars Edvinsson (60 y, male)
Number of research active staff: 1
Research active staff: Lars Edvinsson (60 y, male), Professor
Number of PhD students: 3
Number of PhD graduates (last 3 yrs) 6

ANAESTHESIA & INTENSIVE CARE

1) Three topics next three years

Research in the neurological field concentrating on severe traumatic head injury as well as severe brain ischemia after cardiac arrest. The research will be based on physiological principles for brain volume and brain perfusion regulation and the effect of hypothermia as a protective mechanism. Another field of research concentrates on substances responsible for sepsis and endogenous protective mechanisms in sepsis. Mechanisms for lung protection of the newborn is a third hot field of research in the department.

All topics are both preclinical experimental and clinical. The experimental research is performed in the buildings of the biomedical centre. The clinical research is performed in the general and neurointensive care units and in the neonatal department. The cardiac arrest cooling project is involved in a great net work in Scandinavia also including parts of Europe.

Neurological research including that from the department of Anesthesia and Intensive care has become one of the main topic of the Medical Faculty of Lund.

2) Collaborations
Neurointensive care research: Mayo Clinic, USA, Umeå University Hospital, Professor EM Larsson Neuroradiologi Aalborg. Professor Sten Rubertsson, Academic Hospital of Uppsala, A Perner, Anesthesia and Intensive Care Rigshospital of Copenhagen.

Coagulation research: Collaboration with Sahlgrenska University, Gothenburgh, Karolinska Hospital Stockholm, Academic Hospital Uppsala, University Hospital Örebro, Rigshospitalet, Copenhagen and the university Hospital of Maastrich, Holland.

Pain research: Dept Anaesthesia and Pain Medicine, Royal Perth Hospital, Perth, Western Australia, Australia. Dep of Anesthesia and Intensive Care, University Hospital of Linköping.

Malignant hyperthermia research: prof Clemens Mueller, dep of Human Genetics, Biozentrum Wuerzburg, Germany.

Institution for infectious medicin Uppsala.

Neonatal research: Dr Jan Johansson dep of Molecular Bioscience, section of veterinary medical biochemistry, Uppsala University. Professor Anders Larsson, Dept. of Anesthesiology & Intensive Care, Aarhus University, Denmark

3) Infrastructure
Laboratory research performed in 3 different laboratory facilities of the biomedical centre in Lund. Clinical research at various departments in the University Hospital of Lund, mainly the Intensive Care unit and General Surgery Unit.

Head of unit: Per-Olof Grände (63 y, male)
Number of research active staff: 2
Research active staff: Per-Olof Grände (63 y, male), Professor Mikael Bodelsson (46 years, male), Professor
Number of PhD students: 18
Number of PhD graduates (last 3 yrs): 2

CARDIOLOGY

1) Future plans for the next three years:
Continue LUNDHEARTGENE-project which builds a biobank on all patients with acute coronary syndromes coupled to the unique Swedish registers for acute and longterm follow up. Cardioprotection evaluated with MRI studies from pig to man with a planned phase III hypothermia study 2009. Cardiac stem cell development and transplantation (Major EU grant recently received).

2) Collaborations
Strong prolific collaboration with Cardiac MRI group (Prof Arheden) and for genetics with Ass Prof Olle Melander, Medicine, Malmö. Drug development projects with organic chemists in Lund and NIH. Nanoassay development with Lund Institute of Technology. Clinical phase II and III collaboration with Clinical pharmacology, Lund and Prof Lars Wallentin, Uppsala. A large number of international collaborations in Europe and USA and more.

3) Infrastructure:
No core facilities
Head of unit: David Erlinge (43 y, male)
Number of research active staff: 3
Research active staff: David Erlinge (43 y, male), Professor Yuan Shiwen (56 y, male), Researcher Pyotr Platonov ( , male), MD, PhD
Number of PhD students: 14
Number of PhD graduates (last 3 yrs): 9

RESPIRATORY MEDICINE AND ALLERGOLOGY

Head of unit: Claes-Göran Löfdahl (59 y, male)
Number of research active staff: 4
MEDICINE

The science in the department has two major lines, diabetes research and gastroenterological/nutritional research related to inflammatory bowel disease and colon cancer.

The comprehensive three year plan for the diabetes research in Bo Ahrén’s group is to develop a GLP-1 based treatment of type 2 diabetes, in Mona Landin-Olsson’s group to relate certain immunological aspects to clinical course in type 1 diabetes. Collaboration within the University primarily within the diabetes program with Cecilia Holm, Eva Dehgerman and Leif Groop. The comprehensive three year plan for the gastroenterology/nutrition research is to use dietary polar lipids and and enzymes and chemokine receptors involved in intestinal lipid signalling to improve therapy in inflammatory bowel disease and in novel mechanisms in prevention of colon cancer. Collaboration within the University with William Agace, Frank Sundler, Bo Jönsson, Nils Wierup, Patrick Adlercreutz LTH and externally with Danish Technical University, Copenhagen and Georgia Tech Institute, Atlanta USA.

MEDICAL ETHICS

1. The Medical Ethics Unit will do research within the general area of medical ethics. In particular three areas will be in focus: (i) Bioethics (e.g. the ethical implications of stem cell research); (ii) Ethical problem in relation to nano-medicine; (iii) Medical decision-making.

Two internationally important research areas within the Faculty of Medicine are stem cell research and nano medicine. In this way our research relates directly to the main topics of the faculty.

2. Medical Ethics collaborates (within the university) with: Faculty of Engineering, Department of Philosophy, The Vårdal Institute, School of Economics and Management, Faculty of Social Sciences.

Medical Ethics collaborates (outside the university) with: Decision Research, Eugene, Oregon; Sheffield University; Department of Philosophy, University of York; East-West Center, Honolulu, Hawaii; Département de philosophie, Université de Genève; and a number of European universities participating in the following project: Eurostemcell, ESTools, Eurostem, Neurostem.
1) Future plans for the next three years:

- Intensify studies on the pathophysiology of microalbuminuria in animal models, using FITC-Ficoll, and in a patient population.
- Development of a technique to use FITC-Ficoll in the human setting (without causing adverse effects)
- Unravelling of the molecular and physiological mechanisms in the remarkable effects of ACTH on albuminuria in the nephrotic syndrome
- Further studies of the apoptotic potential in neutrophils and stable vasculitis patients

The first two research topics are organized within the Vascular Wall Programme; the third one within the Blood & Defense Programme. Within the latter programme (Blood & Defense), we have several collaborations concerning vascular inflammation, PR3 and BPI. Active part in the collaboration’s Linne application “Host-pathogen interactions in severe infections.”

2) Collaboration

**within the university:**

**Microalbuminuria research:**
Collaboration with Lars Björck, Fredrik Leeb-Lundberg, Karl Swärd.

**Vasculitis research:**
Lars Björk, Mattias Collin, Diana Karpman, Tor Olofsson, Urban Gullberg, Heiko Herwald, Lennart Truedsson.

**Collaborations through network**
Prioritized collaborative network “Blood an Defense” at Lund University with 30 different researchers. (Mårten Segelmark is a board member)
On regional (South Sweden) and local (USiL and UMAS) levels we have, together with Professor Gunnar Sturfelts group at the department of Rheumatology, formed a network of clinicians interested in systemic vasculitis.

**outside the university:**

**Microalbuminuria research:** Olav Tenstad, Helge Wiig, Department of Physiology, Bergen and William Fissell, Cleveland Clinic.

**Vasculitis research:**
Drs. Patrick Nachman, Charles Jennette and Ronald Falk, Chapel Hill, NC, USA. Dr. Kline Bolton, UVA, Charlottesville, VA, USA. Drs Caes Kallenber and Peter Heeringa, University of Groningen, the Netherlands. Dr Veronique Witko-Sarsat, Paris, France. Dr Dorin-Bogdan Borza, Vanderbilt University, Nashville, TN , USA. Ming Hui Zhao, First university hospital, Beijing, China. Professor Mohamed Daha, Leiden University, Leiden, NL.
The CF centres in Lund and Copenhagen, and the Panum Institute at Copenhagen University (for the importance of BPI-ANCA in CF, and the role of different strains of *P. aeruginosa* and the development of BPI-ANCA).

**Collaborations through network**
EUVAS (European vasculitis Study Group) in which Kerstin Westman is member of the steering committee. (treatment of patients with systemic vasculitis and access to collected serum samples from the multicenter studies)
Classification of vasculitis for the development of diagnostic criteria for epidemiological studies. A group formed by EULAR and EMEA (Mårten Segelmark member of the steering committee)

3) Infrastructure

**core facilities:** Tissue culture lab (class I and II), integrative physiological experiments on intact animals, genetically modified animals (usually mice). γ-counter, HPLC (size exclusion chromatography), auto analyser, fully equipped molecular biology lab (RNA and DNA), real time PCR, FACS equipment (both sorting capacities and analytical instrument), protein chemistry lab, access through the Swegen project to mass spectroscopy, micro array and proteomics system.

Head of unit: Bengt Rippe (57 y, male)
Section III

DERMATOLOGY

Re: Future plans

Within a project of skin integrity and innate immunity, the objective is to design and develop novel peptide-based antimicrobials for skin disorders using a unique combination of most of the state of the art methodologies as well as ex vivo and in vivo models. We address atopic eczema and wound healing as well as impetigo and chronic genital infections. In a broader context we want to investigate the role of host-defence peptides in surveillance not only of infections, but also of the development of malignant cells in the skin.

In other projects we investigate in detail the allergic skin inflammation elicited by the penetration of small chemical molecules (haptens), the chemical metabolism and activation of the haptens in the skin, the specific coupling of haptens to skin proteins to create full antigens capable of activating T cells and the initiation of a specific allergic response. These studies aim at models for in vivo modulation of various key steps of the allergic inflammation with definite implication for clinical therapy.

Re: Infrastructure

At the Biomedical Center and through collaborations with other Departments in Lund, Uppsala, Umeå and Krakow we have all necessary methodologies in reach as well as animal facilities and patients for clinical research.

INFECTION MEDICINE

1) Three topics/research areas the coming three years:

1. Study the mechanisms of a newly discovered antioxidant protein and radical scavenger.
2. Study the therapeutic potential (in autoimmune diseases) of two bacterial enzymes with unique specificity for IgG antibodies.

3. Define molecular bacteria-host interactions that contribute to severe inflammation and sepsis, and utilize obtained results for the diagnosis and treatment of bacterial infection.

These topics engage researchers at our Division with different background (chemists, physicians, cell and molecular biologists) and there will be collaborations with many research groups associated with the Blood and Defence Network also outside the Division. In relation to the main topics of the faculty, these research areas relate to human defence mechanisms during inflammation and infection. They are truly translational with implications for autoimmune and infectious diseases.

2) Collaborations

Numerous collaborations between research groups within our Division and Department, other research groups within our Faculty and LU. Outside LU with groups in Stockholm, Göteborg, Umeå, Linköping and Uppsala. Many international collaborations with colleagues in: USA, Germany, New Zealand, Finland, Ireland, Italy, Canada, Denmark, Czech Republic, France.

3) Infrastructure

We are running a P2 laboratory for pathogenic micro-organisms at BMC, B14, which is open for all research groups at BMC, Lund.

Head of unit: Lars Björck (58 y, male)
Number of research active staff: 12
Research active staff: Lars Björck (58 y, male), Professor
Maria Allhorn (49 y, female), Researcher
Mattias Collin (36 y, male), Research Fellow
Inga-Maria Frick (54 y, female), Researcher
Heiko Herwald (44 y, male), Researcher
Karin Kidd-Ljunggren (54 y, female), Researcher
Mattias Mörgelin (47 y, male), Researcher
Ingrid Nilsson-Ehle (63 y, female), Senior Lecturer
Ole E. Sörensen (46 y, male), Researcher
Hans Tapper
Bo Åkerström (55 y, male), Professor
Hans Norrgren
Number of PhD students: 17
Number of PhD graduates (last 3 yrs): 9

ORTHOPEDICS

Concerning the list of publications we notice that none of those chosen from our groups have been selected to represent ongoing research activities. We did not specifically mention why they were selected, but they were all selected as the article of the month which describe shortly the high scientific quality and interest (see links). They should be included in the list of publications.

Concerning the two new centers, National Competence Center and the MORSE project, they are well described. The preclinical and clinical cooperation in the musculoskeletal field is established in the Tissues in Motion program, which has been reevaluated externally and extended. The strength in the department lays in the different areas described in Form 2, but is backed by research starting with basic biology, clinical research in a number of areas, again described in Form 2, and finally most important, following biofunction in the national register studies now runned by the new musculoskeletal competence center. I am resending our form in hard and electronic copy.

Future
The four new activities: National Competence Center, MORSE, Tissues in Motion and the WHO center, will all have a significant input on future research as well as the close relation between biomaterial, biomechanics, cartilage metabolism, animal experiments, bone transplantation and radiostereometry.


The major part of the health care consumption in musculoskeletal disorders is caused by fractures, joint diseases (osteoarthritis and rheumatoid arthritis), back problems, injuries, and tumors. This pattern is reflected in the research activities.

Laboratory facilities exist within the Department for the following areas: biomaterial, biomechanics, cartilage metabolism, animal experiments, bone transplantation and radiostereometry. In addition to some 30 M.D. clinical investigators, a total of 3 laboratory technicians, 4 engineers/engineering students, 5 statisticians and 6 secretaries are engaged in the research work. Currently, a total of around 15 graduate students are working on their Ph.D. thesis within the Department. With the opening of the Biomedical Center (BMC), linked to the University Hospital, the collaboration with preclinical research in cell- and molecular biology within connective tissue was enhanced.

In 2004 a National Competence Center for studies on musculoskeletal disorders (NKO) giving statistical, epidemiological health economy advices to researchers, funded by Federation of Swedish County Councils and National Board of Health and Welfare, was opened and moved into new facilities in the hospital 2007 http://www.nko.se.

The MORSE project - a five year collaboration between the Southern Sweden regional health authority and the Swedish Social Insurance Agency – started September 1, 2006 and focus on research and development on musculoskeletal health problems, sick leave, and health services utilization and also developed guidelines for the treatment and rehabilitation of musculoskeletal disorders and the effect of implementation of these guidelines http://morse.nu.

The Medical Faculty decided in 2004 based on an external evaluation to fund a new program area – Tissues in motion, where the Department of Orthopedics is an active partner. The program has been extended for another 3 year period 2008-2010 http://www.med.lu.se/tissuesinmotion.

In December 2007 the department has been designated as a World Health Organization Collaborating Centre for Evidence-Based Health Care in Musculoskeletal Disorders http://bjdonline.org.

Research on joint disease and its consequences spans from basic genetic and biochemical investigations to applied projects which monitor nationwide the outcome of arthroplasty and includes the following aims:

- Develop methods for diagnosis and monitoring of early-stage osteoarthritis through patient-administered outcome scores, radiography, arthroscopy, MRI and analysis of joint fluid and serum markers of cartilage turnover as well as investigate the disease mechanisms;
- Epidemiology and risk factors for osteoarthritis following joint injuries
- Improve diagnostic and reconstructive techniques after knee ligament injury;
- Improve and develop techniques for joint replacement in the rheumatoid joint;
- Study the process and causes of joint implant loosening in hip and knee;
- In a nationwide, prospective multicenter study investigate patterns of knee joint implant failure related to time, implant type, infection, age, etc.

Fracture research includes:

- In a nationwide, prospective multicenter study investigate the epidemiology and treatment of hip fractures and its effects on health care economics;

Biomaterial and Bone Biology Research includes:

- A study of the process of bone induction and its stimulation by human recombinant growth factors;
- Synthetic bone substitutes for fracture repair;
Research on lumbar back pain and sciatica aims to optimize patient information, surgical methods, postoperative treatment, and utilization of hospital resources. A new mini-invasive ultrasound technique for treatment of discal hernia is studied.

Research on different methods of treatment for gangrene of the lower extremity caused by diabetes is evaluated with regard to quality of life, cost, etc.

Research on orthopedic oncology evaluates diagnostic procedures, surgical techniques, and prognostic classification of soft tissue tumors. Surgical treatment of skeletal metastases are studied concerning technique and outcome.

Research in hand surgery includes evaluation and treatment of ligament injuries in distal radius fractures in young patients.

Research in pediatric orthopedics targets gait and function analysis in children with cerebral palsy and pathophysiology in Perthes’ disease.

For further information you may also visit our website at http://www.med.lu.se/klinvetlund/ortopedi

Prevention of dislocation of the hip in children with cerebral palsy. The first ten years of population-based prevention programme.
Hägglund G, Andersson S, Duppe H, Lauge-Pedersen H, Nordmark E, Westbom L
March 2005, see article of the month.

The effects of a four-month exercise program on knee cartilage proteoglycan content in patients at risk of osteoarthritis
Roos EM & Dahlberg L.
December 2005, see article of the month.

Identification of low-risk tumours in histological high-grade soft tissue sarcomas
August 2007, see article of the month.

( http://www.medfak.lu.se/search_medfak/html/monthly.php)


Possible links to Departmental Home pages, etc etc.: http://www.med.lu.se/klinvetlund/ortopedi,
www.ort.lu.se

Possible links to Strategic plans
Link to Lund University Publications (LUP) - Departmental publication list: http://www.med.lu.se/nyheter/lvmj_visas_inte
www.ort.lu.se

Possible links to earlier external evaluations:
http://www.med.lu.se/tissuesinmotion.

Head of unit: Lars Lidgren (64 y, male)
Number of research active staff: 9
Research active staff: Lars Lidgren (64 y, male), Professor
Richard Froboll (39 y, male), Research Fellow
Stefan Lohmander (64 y, male), Professor
Ewa Roos (48 y, female), Researcher
Karl-Göran Thorngren (62 y, male), Professor
Magnus Tägil (47, male), MD, PhD
Gunnar Flivik (47, male), MD, PhD
Jian-Sheng Wang (50, male), MD, PhD, Researcher
Hans Wingstrand (59, male), Professor

Number of PhD students: 21
Number of PhD graduates (last 3 yrs): 14

RHEUMATOLOGY

1) Future plans for the next three years:

Focus will be put on the project within matrix biology with emphasis on development of novel markers for pathological tissue turnover in rheumatic conditions e.g. rheumatoid arthritis, osteoarthritis and systemic sclerosis with the aim of elucidating pathways of tissue destruction and ways to prevent it. The section is internationally competitive in this field. Another focus will be put on systemic lupus erythematosus with particular emphasis on national and international collaborations focusing on genetical and environmental risk factors for developing this disease.

A third prioritized field will be clinically oriented studies of novel biological principles for treating rheumatoid arthritis and spondylarthritides based on a unique monitoring system developed in Lund and encompassing all patients treated with such drugs, e.g. cytokine inhibitors, in southern Sweden.

These topics are closely related to other main topics of the faculty. The project within matrix biology is included in one of the prioritized research areas within the faculty and is part of the program area Tissues in Motion.

2) Collaborations:

Examples of collaborations within the university include the groups of Dick Heinegård, Anna Blom, Björn Dahlbäck, Åke Oldberg, Gunilla Westergren-Thorsson, Lennart Truedsson, Thomas Leandersson, Lennart Jacobsson and The National Competence Centre for Musculoskeletal Disorders in Lund.

The most important collaborations outside the university include AutoCure, a research network supported by EU, The osteoarthritis initiative, a network supported by NIH, CARISS, a network of rheumatological researchers in southern Sweden, ARTIS, a network of rheumatological researchers in Sweden, the international SLICC network for systemic lupus erythematosus research, the groups of Wim van den Berg, Nijmegen, Holland, Robin Poole, Montreal, Canada, Gerd Burmester, Berlin, Germany, Tim Cawston, Newcastle, UK, Sören Jacobsen, Copenhagen and Klaus Bendtzen, Copenhagen, Denmark, Patric Venables, London, UK. A number of other national and international collaborations focusing on a specific topic are ongoing.

3) Infrastructure:

The section of rheumatology has lab space at BMC in close connection with collaborators (Dick Heinegård, Gunilla Westergren-Thorsson) and also at the Section for Immunology (Lennart Truedsson). A unique database for patient data as well as a biobank for patient samples continuously retrieved is available. A close connection between the section and the clinic is maintained and essential for the clinical parts of the research projects.

Head of unit: Tore Saxne (59 y, male)
Number of research active staff: 4
Research active staff: Tore Saxne (59 y, male), Professor
Pierre Geborek, MD, PhD
Gunnar Sturfelt, MD, PhD
Agneta Scheja, MD, PhD

Number of PhD students: 8
Number of PhD graduates (last 3 yrs): 4
Section IV

CHILD AND ADOLESCENT PSYCHIATRY

Head of unit: Lil Träskman-Bendz (63 y, female)
Number of research active staff: 1
Research active staff: Gisela Priebe (50 y, female), Psychologist
Number of PhD students: 3
Number of PhD graduates (last 3 yrs): 2

EXPERIMENTAL BRAIN RESEARCH

Head of unit: Tadeusz Wieloch (57 y, male)
Number of research active staff: 4
Research active staff: Tadeusz Wieloch (57 y, male), Professor
Håkan Toresson (40 y, male), Research Fellow
Eskil Elmér ( , male), MD, PhD
Karsten Ruscher ( , male), Postdoc researcher
Number of PhD students: 4
Number of PhD graduates (last 3 yrs): 3

CLINICAL NEUROPHYSIOLOGY

Head of unit: Ingmar Rosén (67 y, male)
Number of research active staff: 1
Research active staff: Ingmar Rosén (67 y, male), Professor
Number of PhD students: 3
Number of PhD graduates (last 3 yrs): 1

LOGOPEDICS, PHONIATRICS AND AUDIOLOGY

1) Future plans for the next three years:
- a very brief description (a maximum of 5 sentences) of no more than three topics/research areas

The Developmental language disorders group will continue its highly productive and innovative work with a focus on pragmatics and communicative interactions.

The Cochlear implants group will extend its toolbox of experimental techniques to include electrophysiological studies of linguistic and cognitive development in children with cochlear implants, also applying these techniques to very young infants.

The Voice disorders group is starting a study of the relationship between room acoustics and voice use/voice disorders, and is also extending its work on evaluating different surgical techniques and voice therapies, with particular emphasis on the quality of life of the patients.

- organization of research topics

The work in these three areas is carried out by separate research groups, two of them lead by internationally well established and recognized scientists, Anders Löfqvist (voice disorders) and Ulrika Nettelbladt (developmental language disorders). The
third group, lead by Birgitta Sahlén (associate professor), is newer, but has already been successful in obtaining competitive external funding. Each group has at least one doctoral student and two senior scientists.

- relation to the main topics of the faculty

Since the focus of the faculty is health care in the broad sense, the studies described above fit well into the overall mission of the faculty as outlined in the strategic plan.

2) Collaborations
- within the university
Linguistics
Cognition
Psychology
Neurophysiology

- outside the university
Technical University of Denmark, Copenhagen, Denmark
Haskins Laboratories, New Haven, CT, USA

3) Infrastructure:
- List of core facilities
In addition to core audiological facilities and analysis systems, hardware and software for acoustic analyses of speech, the unit also has a state of the art digital high speed imaging system that allows recording vocal fold vibrations with 4000 frames per second, fully equipped with software for automatic image extraction (contour mapping) and separate analysis of the two vocal folds.

Head of unit:         Eva Wigforss (61 y, female)
Number of research active staff: 11
Research active staff:
Eva Wigforss (61 y, female), Senior Lecturer
Barbro Bruce (54 y, female), Senior Lecturer
Christina Dravins (52 y, female), Senior Lecturer
Kristina Hansson ( , female), PhD, Senior Lecturer
Boel Heister-Trygg (55 y, female), Senior Lecturer
Eva Holst (61 y, female), Senior Lecturer
Kajsa Johansson (38 y, female), Senior Lecturer
Viveka Lyberg-Åhlander (42 y, female), Senior Lecturer
Anders Löfqvist (63 y, male), Professor
Ulrika Nettelbladt (60 y, female), Professor
Birgitta Sahlén (55 y, female), Professor

Number of PhD students: 8
Number of PhD graduates (last 3 yrs): 1

NEUROSURGERY

1. Future plans

The promising results from the immuno-gene therapy against the most malignant brain tumours (the BRIGTT project) will be followed up by the translation to our patients of our newly developed therapies with excellent results in the laboratory where up to 90% cure has been reached in rats and mice. This is a major challenge and further solidifies our position as the only department that has proven significant effect in patients > 50 years with autologous glioma cells transfected with the human IFN-gamma gene.

Organization of research topics
The experimental activities of Dept of Neurosurgery are concentrated to the Raising Laboratory for Translational NeuroOncology (described in the original RQ08 reply)
The different subgroups represent the research topics organization.
The Raising Lab also handles all clinical activities concerning the patients with Glioblastoma Multiforme. PI the professor of Neurosurgery.
Other clinical research activities are driven by the associate professors and other doctors of the clinical department of Neurosurgery who are not formally employed by the University but 100% by the Hospital. However, intense research activities are running also in the fields of vascular, paediatric, functional, spinal and intensive care.
It could be mentioned that the professor of Neurosurgery and his senior 4 associate professors under a 2 year period recently published 67 papers registered in PubMed.

Relation to main topics of the faculty

Oncology in collaboration between basic research (within and outside the Faculty) and clinic is a central theme of our Faculty. Traditionally Neurosurgery has taken care of all research involving the oncology of the brain and major contributions have been accomplished especially in the field of the malignant brain tumours. We have already in the early 80-ies started the collaboration with depts of Tumour Immunology, Oncology, Neuropathology. Neuroradiology, Clinical Genetics and Neurology within the Faculty. In the late 80ies, we started and developed close collaborations with the Faculties of Science and Technology (depts of Biochemistry, Nuclear Physics, Atom Physics) and in later years with Depts of Immune Technology, Proteomics and Micro Array technology)
So we feel that we since long have a close relation with actual research in large areas of main topics of the Faculty.

2 Collaborations

We have extensive collaboration with anaesthesiology, neurophysiology, neurology, neuropathology, neuroradiology, oncology, clinical genetics, paediatrics, radiophysics both within the medical faculty and also with other faculties of Lund university such as Faculty of Science and of Engineering.

We have international collaboration with a series of universities. To mention some:
Duke University, Durham, NC and Columbia University, NY, USA; Nagoya University, Japan; Shantou University and Fudan University, Kina; the Panum Institute and Niels Bohr Institute, Copenhagen.

3 Infrastructure core facilities

Thirty years ago a special laboratory for experimental neurooncological research was instituted in the unit by Salford, and this lab, since 1998 named the Raising Laboratory for translational neurooncology, now comprises 20 full or part time researchers and about the same number of clinicians involved in the research. The lab at the moment educates 14 doctorees and has produced about 20 thesis during its existence.
The Raising lab is lead by prof. Salford and has a large number of subgroups, all lead by a principal investigator:

**Brain Immuno Gene Tumour Therapy group (BRIGTT)** which comprises 20 researchers and clinical staff. This group has translated basic research in our rat models into a treatment model for patients with glioblastoma multiforme where the patient’s own glioma cells, taken at surgery and cultured in our Clinical Transduction Laboratory until the malignant cells can be utilized for immunisation of the patient. Then the cells are transduced with the human IFN-gamma gene by the help of adenviral vectors. 2 Million glioma cells are irradiated before injection intradermally in the arm at 8 – 14 instances, every 3 weeks. Our laboratory is the only in the world utilizing this technique and we have been successful with a prolongation of life of about 80%, but strive to reach cure for this highly malignant disease.
This group also performs differential serum protein profiling of GBM patients immunized with autologous glioma cells transfected with the IFNγ gene, and their controls and compares mRNA and protein expression profiles in glioblastoma multiforme.
(PI Leif G. Salford and prof. Bengt Widegren, molecular genetecist)

**Glioma ImmunoTherapy group (GIT),** which runs a series of animal studies to find new and improved techniques to translate to the human situation. More immunostimulatory cytokines and genes are tested. GM-CSF transfected mouse glioma cells (GL261-GM-CSF) have been established to be used for immunotherapy either alone or in combination with recombinant IFNγ.
DCs from mouse and rat bone marrow-derived precursors are cultured, using different combinations of growth factors (P.I. Docent Peter Siesjö, neurosurgeon)

**Cancer Cell Biology** identifies signaling pathways for glioma initiation and progression. Establishes in vitro culture
conditions for long-term maintenance of low and high grade glioma cells by simulating the glioma niche conditions. (P.I. Docent Xiaolong Fan, also active in the Lund Stem Cell Center).

**Stem Cell group** studies the possibilities to utilize exogenous stem cells as therapy for malignant glioma. Transplantation of stem cells from adult subependymal zone to animals with experimental malignant brain tumor and subependymal zone-derived cells as vehicles for immunogenes and oncolytic viruses. The group performs in vitro studies and characterization of stem cells from human subependymal zone and malignant glioma and studies Endogenous stem cell proliferation in animal models of intracerebral tumors. (P.I. Docent Johan Bengzon, neurosurgeon and half time employed by the Lund Stem Cell Center)


Outside the oncological research but still within the Raising Laboratory exists also a

**Spinal Cord Injury Group** which has developed models for spinal cord injury in the rat and experimental therapy with a patented cell line starts during the spring 08. (P.I. Docent Ola Nilsson, neurosurgeon).

**NEUROLOGY**

1) Future plans for the next three years:
   - a very brief description (a maximum of 5 sentences) of no more than three topics/research areas
   - organization of research topics
   - relation to the main topics of the faculty

**Cell and gene therapy for neurological disorders:** We have pioneered the field of cell replacement for brain disorders. Our plans are now to develop stem-cell based and gene therapies for Parkinson’s disease patients, and novel stem cell and gene therapeutic approaches for stroke and epilepsy patients.

**Stroke epidemiology and stroke genetics:** Lund Stroke Register will continue to monitor trends in regional stroke incidence and prognosis, and to collect genetic samples of all patients up to at least 2010. We will contribute to the first genome-wide genetic screening in 30 000 patients with stroke and 10 000 controls, as well as other genetic projects exploring mechanisms and pathophysiological pathways of stroke.

Experimental and clinical neuroscience research is one of the main topics of the Medical Faculty

2) Collaborations
   - within the university (unit, department, faculty, university level)

The clinical stroke research group has well-established collaborations with the sections of neuroimaging, neurosurgery, cardiology, genetics, and basic neuroscience
The translational research groups in cell and gene therapy have collaborations with many sections within the university, both within the Medical Faculty (including sections of neurobiology, neurosurgery, clinical neurophysiology, radiology, gynaecology) and with other faculties (Faculties of Science and Technology: theoretical physics, analytical chemistry, electrical measurements)

- outside the university

The clinical stroke research group interacts closely with the International Stroke Genetics Consortium (http://strokegenetics.org), a collaboration established 2007 led by the BROAD Institute of MIT and Harvard with 19 contributing centres from USA, UK, Poland, Germany, China and Sweden.

The translational research groups in cell and gene therapy have many international collaborations including:

1. MRC Clinical Sciences Centre and Division of Neuroscience, Faculty of Medicine, Imperial College, Hammersmith Hospital, London, UK
2. Sobell Department of Motor Neuroscience and Movement Disorders, London, UK
3. Department of Neurology, University of Marburg, Marburg, Germany
4. Institute for Stem Cell Biology, University of Cambridge, UK
5. In-vivo-MRI laboratory, Max-Planck-Institute for Neurological Research, Köln, Germany
6. European Molecular Biology Laboratory, Monterotondo, Rome, Italy
7. Brain Repair group, University of Cardiff, Great Britain
8. Brain Mind Institute, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland
9. Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland
10. Institute of Biotechnology, University of Helsinki, Finland
11. Laboratory of Molecular Neurobiology, Department of Medical Biochemistry and Biophysics, Karolinska Institute, Stockholm, Sweden

3) Infrastructure
   - List of core facilities

   Full facilities of a comprehensive acute stroke centre with large patient groups, comprehensive data collection, and multidisciplinary clinical and basic scientific expertise.

   Facilities for regular harvesting of neural stem cells from human fetal brain tissue.

   Facilities for functional analysis of individual stem cell-derived neurons using patch-clamp technology

   Head of unit: Olle Lindvall (61 y, male)
   Number of research active staff: 6
   Research active staff: Olle Lindvall (61 y, male), Professor Mérab Kokaia (52 y, male), Professor Zaal Kokaia (46 y, male), Professor Arne Lindgren (50 y, male), Professor Bo Norrving (57 y, male), Professor Håkan Widner ( , male), MD, PhD
   Number of PhD students: 13
   Number of PhD graduates (last 3 yrs): 9

   NEUROLOGY, Malmö

   Head of unit: Jesper Petersson (46 y, male)
   Number of research active staff:
   Research active staff:
   Number of PhD students:
1) Future plans for the next three years, Ophthalmology:
The Research programmes are fruits of a deliberate joining together of clinical and experimental work at the department of Ophthalmology in Lund according to following:

- Using neuroprotective agents to halt or delay photoreceptor cell death in animal models for retinal degeneration, continue the ongoing research regarding transplant of full-thickness neuroretina and further development of animal model regarding retinal vascular disorder.

- In connection with the clinical center for inherent retinal disorder in Lund, classified as a high specialist care centre, using the Swedish RP-register in including 2 700 patients, the Biobank including 1700 separated DNA and at least 100 large pedigree.

- Further research regarding experimental vitreous surgery as Lund is a clinical high specific centre in the in South of Sweden for retinal vitreous surgery.

2) Collaborations
All parts of the research program involves collaboration between experimental and clinical work. Beside this several laboratories round the word are involved in these studies and recently a collaboration was signed called European Advanced Research Network on Retinal Degeneration (EARN-RET. With Core Group : Lund – Tubingen

3) Infrastructure
List of core facilities:
Laboratories for experimental work belonging to the ophthalmic research group have been used since several years at BMC Lund
Clinical research laboratories have been used since several years at the Department of Ophthalmology at the University Hospital in Lund

Number of PhD students: 13
Number of PhD graduates (last 3 yrs): 8
Number of research active staff: 4
Research active staff: Lil Träskman-Bendz (63 y, female), Professor
Anders Tingström (, male), Senior specialist
Agneeta Öjehagen (61 y, female), Professor
Per Nettelbladt (, male), Senior lecturer
Number of PhD students: 10
Number of PhD graduates (last 3 yrs): 5

REHABILITATION MEDICINE

1) Future plans for the next three years:
- a very brief description (a maximum of 5 sentences) of no more than three topics/research areas
- organization of research topics
- relation to the main topics of the faculty

Research within Rehabilitation is organised into three main themes: neurorehabilitation, long-term pain and neuromuscular function. All three themes are linked with and continue to collaborate within major centres within the university (see below) and research over the next three years will focus on interventions and outcome. Descriptions of long-term outcome and the effects of novel therapeutic interventions in people with stroke, traumatic brain injury, spinal cord injury, neuromuscular disorders and multiple sclerosis will be investigated. The effects of interdisciplinary rehabilitation in long-term pain and the effects of various components of the programs will be investigated. Translational studies of the human motor unit, using invasive and non-invasive techniques will describe changes following healthy ageing and various forms of physical activity in health and disease.

2) Collaborations
- within the university (unit, department, faculty, university level)
- outside the university

Rehabilitation medicine is part of the newly established Centre for Ageing and Supportive Environments (CASE), funded for 10 years by the Swedish Council for Working Life and Social Research, and the professor of Rehabilitation medicine is a member of the steering committee. It is also involved in the Lund University Pain Research Centre, and has longstanding collaborations with the following units within our own department: Orthopedics, Clinical neurophysiology, Neurology, Neurosurgery and Otorhinolaryngology, head and neck surgery. It has close collaborations with the Department of Health Sciences, Divisions of Physiotherapy and Occupational therapy and Gerontology, with joint PhD-students and research programs. Rehabilitation medicine collaborates with scientists at Luleå University of Technology, Umeå University, Örebro University and with scientists at Copenhagen Muscle Research Centre (Denmark), University of Pittsburgh, Harvard Medical School and Rehabilitation Hospital of Indiana (USA).

3) Infrastructure
- List of core facilities

Rehabilitation medicine has one clinical professor (supported by Region Skåne), three PhD students, two part-time post-docs and one technician. The unit has attracted grants of about 1 million SEK per year over the past five years. Rehabilitation medicine is one of the largest clinical departments in Scandinavia, situated at two sites within Lund University Hospital, with about 250 employees covering all medical and allied health disciplines. It has access to several major rehabilitation outcome databases (long-term pain, post-polio, stroke, brain injuries, spinal cord injuries) which constitute the core of the populations to be investigated clinically and in collaboration with basic scientists. The unit has a well-equipped neuromuscular research laboratory, a pain measurement laboratory, extensive experience and knowledge in the evaluation using global outcome measures and quantitative as well as qualitative research methods.
Dissertation within Rehabilitation medicine 2006-
As the Unit was formed 2006, no formal post-graduate research program has been in place. All four thesis have been completed at other department/sections within Lund University or at other Swedish Universities, but based on research conducted partly or wholly within the academic and clinical department/unit of Rehabilitation medicine.

<table>
<thead>
<tr>
<th>Head of unit:</th>
<th>Jan Lexell (50 y, male)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of research active staff:</td>
<td>1</td>
</tr>
<tr>
<td>Research active staff:</td>
<td>Jan Lexell (50 y, male), Professor</td>
</tr>
<tr>
<td>Number of PhD students:</td>
<td>-</td>
</tr>
<tr>
<td>Number of PhD graduates (last 3 yrs):</td>
<td>1</td>
</tr>
</tbody>
</table>

OTORHINOLARYNGOLOGY, HEAD AND NECK SURGERY

<table>
<thead>
<tr>
<th>Head of unit:</th>
<th>Måns Magnusson (53 y, male)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of research active staff:</td>
<td>4</td>
</tr>
<tr>
<td>Research active staff:</td>
<td>Måns Magnusson, (53 y, male), Professor</td>
</tr>
<tr>
<td></td>
<td>Karin Prellner (62 y, female), Professor</td>
</tr>
<tr>
<td></td>
<td>Johan Wennerberg (57 y, male), Professor</td>
</tr>
<tr>
<td></td>
<td>Lennart Greiff ( , male), MD, PhD</td>
</tr>
<tr>
<td>Number of PhD students:</td>
<td>10</td>
</tr>
<tr>
<td>Number of PhD graduates (last 3 yrs):</td>
<td>7</td>
</tr>
</tbody>
</table>

Section V

CANCER EPIDEMIOLOGY

<table>
<thead>
<tr>
<th>Head of unit:</th>
<th>Thor Alvegård (66 y, male)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of research active staff:</td>
<td>2</td>
</tr>
<tr>
<td>Research active staff:</td>
<td>Thor Alvegård (66 y, male), Professor</td>
</tr>
<tr>
<td></td>
<td>Harald Anderson (64 y, male), Senior Lecturer</td>
</tr>
</tbody>
</table>

Number of PhD students:
Number of PhD graduates (last 3 yrs):

CLINICAL PHYSIOLOGY

1) Future plans for the next three years

The ECG-group develops standard 12-lead ECG as well as other more convenient electrode placement techniques for quantitative measures of ischemia and infarction.

The Lung Group develops and applies new techniques for studies of lung physiology in critical care, lung function laboratories and nuclear medicine. It leads standardisation of lung scintigraphy in Europe for diagnostics of lung embolism, heart failure and other diseases and will actively participate in the design of a world wide study of this technique in comparison with X-ray computed tomography. The group will in the coming years focus on diagnostics of lung embolism and heart failure and phenotyping of chronic obstructive pulmonary disease, COPD.

The Cardiac MR Group within clinical physiology will develop novel measurements to quantify ischemia in acute and chronic ischemic heart disease using magnetic resonance imaging. The group will further develop magnetic resonance imaging including 3D blood flow measurements for quantitative purposes in order to investigate intracardiac hemodynamics in normal function and in various cardiac disease states before and after treatment.

- organization of research topics
The ECG-group collaborates closely with the Cardiac MR Group and with the Departments of Cardiology and Emergency Medicine and with several international sites.

The Lung Group comprises five senior researchers within the department and co-operates closely with the Cardiac MR Group, Lung Medicine, Emergency Medicine, Cardiology, European Association of Nuclear Medicine and international partners. Research with lung perfusion SPECT imaging for the diagnosis of lung emboli will be conducted in cooperation with several international sites. The use of the same technique for novel quantification of heart failure will be conducted in collaboration with the local Department of Cardiology and the Cardiac MR Group.

The Cardiac MR Group consists of 16 members drawn from clinical physiology, cardiology, physiotherapy, engineering and applied mathematics and have both national and international collaboration.

- relation of the main topics of the faculty

Imaging is a prioritized area for the faculty. All three research areas are heavily involved or even driving new frontiers in imaging.

Cardiovascular research is a focus for the medical faculty as well as for the university hospital.

2) Collaborations
- within the university (unit, department, faculty, university level)

The ECG group collaborates with Depts. of Cardiology and Emergency Medicine.

The Lung Group collaborates with the Cardiac MR Group, Lung Medicine, Emergency Medicine, Cardiology, and Radiation Physics.

The Cardiac MR Group collaborates with Depts. of Cardiac Surgery, Cardiology, Emergency Medicine and Rheumathology.

- outside the university

The ECG group collaborates with Duke University and Glasgow University

The Lung Group collaborates in the field of nuclear medicine with European Association of Nuclear Medicine and several international partners, e.g. Professor Leonard Freeman, New York, Prof. Massimo Miniati, Pisa, Prof. Carl Schümischen, Rostock and in intensive care: Professor Laurent Brochard, Paris, Professor Laurent Beydon, Angers, Professor Edoardo De Robertis, Naples and others.

The Cardiac MR Group collaborates with UCSF, San Francisco. Johns Hopkins, Baltimore, University of Florida, Jacksonville, Duke University, Durham, Karolinska Institut, Stockholm

3) Infrastructure
- List of core facilities

The ECG group operates on the clinical premises of our department where several modalities for heart studies are available on a daily basis, such as resting ECG, exercise ECG, ambulatory ECG monitoring and also gold-standard methods such as myocardial scintigraphy and cardiac MR imaging.

The Lung Group operates within the field of lung scintigraphy with its unique technique for tomographic imaging of ventilation and perfusion. This technique will from June 2008 be available for all its partners and on a commercial basis globally available. It will part of the basis for upcoming standardisation in Europe. Modern gamma cameras are available in the clinic. In the field of intensive care we operate with a computer/ventilator system developed by the group and available to all its international partners. The Lung Laboratory in the department is a unique facility for comprehensive clinical lung function tests largely developed by the group that will be employed in the study of COPD.

The Cardiac MR Group operates within the Department of Radiology and Clinical Physiology. One 1.5 Tesla dedicated cardiovascular scanner is available 25% during office time for research and 25% for clinical protocols. This machine and a 3Tesla scanner and two dedicated cardiac SPECT machines are available during all week nights and all weekends.

Head of unit: Håkan Arheden (49 y, male)
Number of research active staff: 2
Research active staff: Håkan Arheden (49 y, male), Professor
Björn Jonson (68, male), Professor
Number of PhD students: 7
Number of PhD graduates (last 3 yrs): 7

DIAGNOSTIC RADIOLOGY

Head of unit: Isabella Björkman-Burtscher (38 y, female)
Number of research active staff: 2
Research active staff: Isabella Björkman-Burtscher (38 y, female), Senior Lecturer
Freddy Ståhlberg (55 y, male), Professor
Number of PhD students: 3
Number of PhD graduates (last 3 yrs): 5

ELECTRON MICROSCOPY

Head of unit: Eric Carlemalm (66 y, male)
Number of research active staff:
Research active staff:
Number of PhD students:
Number of PhD graduates (last 3 yrs):

MEDICAL RADIATION PHYSICS

1) Future plans for the next three years:

1A) Medical Imaging
Creating image based platforms for diagnosis and therapy have recently been established as one of the most important research goals for the medical faculty as well as for Lund University and we have established research activity in image processing for diagnostic and therapeutic patient specific modalities.
Supported by a major grant from the Knut and Alice Wallenberg foundation, we now are presently in the process of establishing Lund University Bioimaging Center (LUBIC) with the aim to develop front-end MR and PET techniques, as well as to merge the two techniques together in a preclinical and clinical setting.
The organization of research within the center will be translational with faculty and hospital based research involving both LU and USiL personnel, thus this research applies to one of the main goals (improved translational research) in the strategy plan for Lund University.

1B) Radiation Therapy
The development of new radiation therapy methods with tumor targeting (radiopharmaceuticals) and external irradiation with protons and light ions as well as conventional photon beam combined with image guided dose planning and verification is another main project. Computer models based on Monte Carlo technique will be the used for therapy and image optimization.

1C) Environmental Radiology and Radiation Protection
Environmental radiation protection methods and models will be developed by means in-situ measurements supported by Monte Carlo calculations and new statistical algorithms. Mobile spectrometry for orphan sources will be optimized with special focus on data display and presentation. Development of radiochemical analytical methods for environmental radiology.

Organization
The organization is translational with faculty and hospital based research involving both LU and USiL personnel.
The department is organized in four research groups.
A wide and broad research collaboration nationally and internationally

**Relation to main topics of faculty**
Creating image based platforms for diagnosis and therapy is within the main goals for the faculty.
Focus on neurology and oncology.
Main platform on radiation protection.

2) Collaborations
- within the university (unit, department, faculty, university level)
- outside the university

**Medical faculty:**
Oncology, Clinical Physiology, Urology, Center for imaging and function (BFC), Urology, Neurology, Pathology, Psychogeriatrics, Pediatrics, Anesthesiology, Electron Microscopy

**Natural Science faculty:**
Mathematics, Organic Chemistry, Physics, Physical Chemistry,

**Sweden:**
Dept of Radiation Physics Uppsala, Dept of Radiation Physics Gothenburg, Karolinska Hospital, Stockholm.
Dept of Radiation Physics Stockholm
MR Center, Karolinska Hospital
Radiation Physics and Dept of Oncology, Umeå University

**Europe:**
Royal Marsden Cancer Research Institute, London,
University of Nantes, France.
Novum Research Centre, Copenhagen
MR Centers at the University/University Hospital in Vienna, Magdeburg and Nijmegen.
St Luke’s Hospital, Dublin, Ireland
Allgemeines Krankenhaus – Universitätskliniken, Wien, Österrike
Rigshospitalet, Köpenhamn, Danmark
Herlev Hospital, Herlev, Danmark
Odense Universitetshospital, Danmark
Ospedale San Giovanni, Bellinzona, Schweiz
Universitaetsklinikum Hamburg-Eppendorf, Germany
Trinity College, Dublin, Ireland
University of Sevilla, Spain
University Centre in Svalbard
IAEA - International Atomic Energy Agency, Vienna, Austria
Risö DTU - National Laboratory for Sustainable Energy, Risö, Danmark
European Commission, Joint Research Center, Institute for Transuranium
Elements, Eggenstein-Leopoldshafen, Germany

**USA:**
UCLA, Los Angeles, California
Memorial Sloan Kettering New York, New York
City of Hope, Pasadenå, California
Univ Michigan Medical University, Ann Arbor.
Johns Hopkins, Baltimore.
Univ Massachusets Medical Center, Worcester,
Vanderbilt University, Nashville.
MR Centers in Boston (MGH) and at Stanford University.
Tom Baker Cancer Centre, Calgary, Canada
3) Infrastructure
- List of core facilities
Cyclotron for production of radionuclides for PET
PET and SPECT/CT cameras, Digital Autoradiography, Computer Cluster
MRI scanners: Presently 2 3T units and 3 1.5 T units available for research in collaboration with the Center for imaging and function (BFC).
Lund Bioimaging Center (during establishment 2008/2009):
Micro-PET scanner for small animals
Experimental 9.4 T scanner for small animals
Upgrade of one of the above mentioned 3 T scanners for human imaging (50% research time)
LUBIC’s future planning also involves an ultrahigh field MRI system (7 T) for human imaging.
Two linear accelerators for image guided intensity modulated radiotherapy plus another 4 for conformal/intensity modulated therapy
Radiochemistry and hot cells for radiopharmaceutical production.
A radiochemistry laboratory and low-level counting rooms.
Backpack and carborne gamma spectrometry systems for in-situ measurements.

Head of unit: Sven-Erik Strand (61 y, male)
Number of research active staff: 9
Research active staff:
Sven-Erik Strand (61 y, male), Professor
Sara Brockstedt ( , female) , Researcher
Elis Holm (61 y, male), Professor
Linda Knutsson (female), Research Fellow
Michael Ljungberg (50 y, male), Professor
Christer Samuelsson (65 y, male), Researcher
Katarina Sjögreen-Gleisner (41 y, female), Research Fellow
Freddy Ståhlberg (55 y, male), Professor
Ronnie Wirestam (44 y, male), Senior Lecturer
Number of PhD students (Nat Fak): 16
Number of PhD graduates (last 3 yrs): 6

BIOMEDICAL ENGINEERING

1) Future plans for the next three years:
Tissue analysis by using ultrasound is an important area that will be focused on the next coming years.
Besides the continuation on the Medical Ultrasound area, Patient Security and Safety using Medical Technical Devices are of great importance in the future. Studies on improved actions for raising the safety standard and knowledge within the healthcare staff is a very important task at present and in the near future. Plans for a broad collaboration with a number of actors, from both the University and the University hospital, has been drawn recently. Since the technological part in today’s healthcare is large and will increase, it is important to work with this issues.

2) Collaborations
- within the University (department, faculty, University)
Within the department/faculty close collaborations has been carried out with both Dept. of Diagnostic Radiology and Dept. of Surgery, in the HIFU-project. There is also a close collaboration with the Dept. of Electrical Measurements, at Lund Institute of Technology, within the Ultrasound research area.

3) Infrastructure (core facilities):
Equipment for High Intensity Focused Ultrasound (HIFU), and for analysis of diagnostic ultrasound signals, for tissue analysis.

Head of unit: Nils-Gunnar Holmer (64 y, male)
Number of research active staff: 1
OBSTETRICS AND GYNECOLOGY

1) Future plans for the next three years:
- A very brief description (a maximum of 5 sentences) of no more than three topics/research areas

- Perinatology – clinical, epidemiological, animal experimental and cell biological studies of pathogenetic mechanisms of preeclampsia and intrauterine growth retardation. Investigation of the role of free fetal hemoglobin, development of a new diagnostic marker and testing of new potential treatment with heme-scavenging substances. Clinical studies of management of extremely preterm growth retarded fetuses; postnatal follow-up studies along the Barker’s hypothesis of the fetal origin of adult disease.
- Clinical and experimental studies of ovarian cancer. Studies of signalling pathways of the activation of membrane estrogen receptor GPR30 that influences the EGF/uPA systems involved in the migration/invasion in ovarian cancer cells. Studies of intra-tumor signaling and gene expression. Further studies of biomarker protein(s), e.g. fragments of the uPA receptor or testisin, or pattern(s), which can be used for early detection of ovarian cancer.

- Organization of research topics
Perinatology – six research groups following various research lines within the above project and closely cooperating within the clinical department of Ob&Gyn. All leading researchers are also clinically active.
Ovarian cancer studies – laboratory based research associated to the clinical section of gynecological cancer within the clinical department of Ob&Gyn.
Ultrasound – all lines of research coordinated within the unit of diagnostic ultrasound belonging to the clinical department of Ob&Gyn.

- Relation to the main topics of the faculty
Research on preeclampsia related to the main topic of inflammation within the medical faculty.
Research on ovarian cancer related to the main topic of oncology within the medical faculty.
Research on diagnostic ultrasound related to the main topic of electrical measurements within the technical university LU.

2) Collaborations
- Within the university (unit, department, faculty, university level)

Fredrik Leeb-Lundberg, Dep. for Experimental Medical Science, Cell biology LU, collaboration on GPR30;
Charlotta Welinder, Dep. for Experimental Medical Science, LU, 2D gel proteomics and mass spectrometry.
Christina Wingren and Carl Boerrebaeck, Dep. of Protein Technology, LU, serum expression profiling using a unique recombinant antibody micro array system.
Bo Åkerstrom, Dep. for Experimental Medical Science, LU, A1M and anti-oxidation, measurement of free hemoglobin and the level of antioxidants in biofluids.
Martin Olsson, Blood Centre, IKVL, analysis of free fetal DNA, SNP analysis including HLA typing of preeclamptic patients.
David Ley, Dep. of Pediatrics, Lund University Hospital, inflammation related to prematurity perinatal animal model, follow-up studies
Vineta Fellman, Dep. of Pediatrics, Lund University Hospital, neonatal neurology
Karin Stjernqvist, Dep. of Psychology, LU, psychomotoric development of infants
Thomas Jansson, Institute of Electrical Measurements, Technical University LU, sound frequency analysis of Doppler signals
Nils-Gunnar Holmer, Department of Biomedical Engineering, University Hospital Lund, studies of ultrasound velocities and temperature
Isabella Burtscher, dep of radiology IKVL, MR brain studies
Anders Grubb, dep clin chemistry, IKVL, urinary proteins, cystatin C
Olle Mellander, dep. of endocrinology, IKVM,
Per Olofsson, Ob&Gyn IKVM, studies of fetal acid-base balance
Marcus Larsson, Dep. of pediatrics, IKVL, studies of amniotic fluid
Anders Mattiasson, Department of Urology, IKVL, ultrasound studies of urethral function
Karl Åström, dep of mathematics, Technical University LU, computer analysis of ultrasound images
Helena Ljusberg, LU-Innovation, development of new gel for ultrasound use
Karin Källén, Centre for Reproductive Epidemiology, IKVL, perinatal epidemiology

outside the university
Gunilla Hoyer-Hansen Finsen Lab., Copenhagen, collaboration on uPA receptor.
Toni Antalis, NIH, North Carolina, USA, collaboration on Testisin.
Mark Baker, Australian Proteome Analysis Facility (APAF), collaboration on proteome analyses.
James F. Padbury, Womens & Infants' Hospital, Rhode Island, USA, collection of high-risk pregnancies, cocaine and nicotine abuse.
Hasan Sallam, Suzanne Mubarak Centre for Women's Health and Development, University of Alexandria, Egypt, collection of high-risk pregnancies, women with different ethnicity.
Siriel Massawe, Muhimbili University of Health and Allied Sciences, Dar-es-Salaam, Tanzania
Alexander Hertig, renal med dept, Paris
Richard Levine, NIH, Bethesda, USA, epidemiology of preeclampsia
Henning Schneider, Univ.-Frauenklinik Inselspital Bern, Ch/ Greifswald Germany, dual-placental-perfusion method.
Toste Länne, dep of vascular surgery and dep clin physiology, University of Linköping, vascular physiology
Gunvor Ekman, Ob&Gyn, Ki, Stockholm, studies of uterine contractility
Hans Peter Dietz, University of Sydney, Australia, 3D ultrasound studies of pelvic floor
Zdenek Stembera, Institute for Mother and Child, Prague, Czech Republic, perinatal epidemiology

3) Infrastructure
- List of core facilities
  - Biochemical and cell biology laboratory at Biomedical Centre (BMC) Lund (C14)
  - In vivo department BMC (unique perinatal sheep model)
  - Company PreeLumina AB at the bioincubator-BMC
  - Ultrasound unit, department of Obstetrics and Gynecology, University Hospital Lund
  - Laboratories, Institute of Electrical Measurements, Technical University LU
  - Department of Biomedical Engineering, University Hospital Lund
  - Centre for Reproductive Epidemiology, University Hospital Lund
  - WHO Collaborating centre for development of obstetric quality indicators, Lund
  - MR department, University Hospital Lund
  - Laboratories, Dept of Pediatric Cardiology, University Hospital Lund

Head of unit: Karel Marsal (65 y, male)
Number of research active staff: 7
Research active staff:
  - Karel Marsal (65 y, male), Professor
  - Göran Lingman (58 y, male), Senior Lecturer
  - Vera Nosková (36 y, female) Researcher
  - Bertil Casslén
  - Mats Åkerlund (65 y, male), Professor, Researcher
  - Stefan Hansson
  - Göran Samsioe

Number of PhD students: 15
Number of PhD graduates (last 3 yrs): 7

ONCOLOGY
1). Future plans: Our research will be focused on 1/ Prognostic and prediction factors within malignant tumor diseases, 2) Tumor genetics and cancer epidemiology, 3) Patient related research regarding modern diagnostic tools (markers for monitoring disease), and modern targeted and multimodal therapy strategies.
Ytterligare efterfrågad information framgår av ifylld Form 2-blankett från vår avdelning tidigare i år. Ifylld blankett bifogas med detta mail-svar. Tyvärr blev mycket av den information borttagen dels genom sammanställningen på sektionsnivå och därefter på institutionsnivå vid den slutliga sammanställningen till dekanus. Det finns ingen möjlighet att göra en rättvisande rapportering om vår avdelnings verksamhet med de villkor för rapportering som satts upp. Vår avdelning är en av de största inom medfak betraktat ur forskningsverksamhet, vetenskaplig produktion, personal/ekonomi och administration. Vi är övertygade om att andra avdelningar delar vår uppfattning om svårigheten med denna rapportering till RQ-08.

Organisation and administration unit:
The Department of Oncology is the largest research unit within the Institute of Clinical Sciences in Lund. The Department has two directors, 2 clinical professors and 3 experimental professors.
The Department is part of several networks of excellence at Faculty and National levels, most importantly are CREATE Health, SWEGENE, Lund Stem Cell Centre and Lund Laser Centre.

Special resources:
The very close connection to the Oncologic Clinic and the Department of Cancer Epidemiology/regional tumour registry. The Kamprad laboratory building. Laboratories at BMC. Platforms for molecular biology, imaging, animal models, biomedical optics, biobank, regional and national registries (for example High Risk Genetic Registry, Swedish Lymphoma Registry), Oncologic clinical research unit (OKFE), radiotherapeutic section.

General description of total research profile:
Both preclinical and clinical research: from tumour cell biology to psychosocial oncology, with focus on epidemiology, prevention, diagnostics, prognostics, treatment (including -prediction, -targeting, -monitoring), and multicenter studies.

Special multi- and interdisciplinary activities
CREATE Health
SWEGENE
Lund University Medical Laser Centre (LUMLC)
Cancer Stem cell program
Swedish Oncogenetic Group
South Swedish Breast Cancer Study Group
Swedish resp Nordic Breast Cancer Groups
Swedish Lymphoma Group
SWENOTECA
The Scandinavian Sarcoma Group (SSG)
Cell and Cancer Imaging

Interactions within the department
The research activities are mostly translational combining different disciplines and expertise of relevance.

Relation between research and teaching:

Relation to interactions with other departments within LU:
Divisions of Atomic Physics, Theoretical Physics, CREATE Health, Swegen, Lund Stem Cell Centre, Division of Genetics, Mathematic Statistics, Radiation Physics, Cell- and Organism Biology, Malmö Food and Cancer, Cancer Epidemiology, Occupational and Environment Medicine, with hospital disciplines for cancer diseases (surgery, radiology, pathology, genetic clinic etc)

Standing of the Oncology division:
The Department has a large national and international network in research with large national and international grants emanating into more than 100 publications per year. The Department is internationally well known.

**Strengths:**
The DNA microarray center SCIBLU Genomics (SWEGENE Centre of Integrative Biology at Lund University).
CREATE Health strategic centre for clinical cancer research, merging of various “omics” disciplines with Dept of Oncology with focus on translational aims.
The extensive epidemiological family data and biobank on hereditary cancer available both in research projects and at the high risk registry.
Population based cohorts with large scale hormonal exposure data possible to link with biobanks for molecular epidemiology.
The Lund Laser Centre (recipient of Linnaeus Grants). Imaging core facilities (e.g. PET).
Controlled biobanks and registries for breast cancer studies, melanoma and lymphoma studies. Biobanks of healthy referents (blood and normal breast tissue).
Ability to carry out clinical trials and to act as a centre for national and international studies.
Good financial support (ALF, VR, CF, Linnaeus, SSF, NIH, private foundations). For year 2007: external grants 35 M SEK, ALF 9.5 M SEK, FoUU 2 M SEK, and 10 M SEK for investments into core facilities for bioimaging and molecular biology.

**Weaknesses:**
To combine clinic and experimental activities for the doctors. Overall low research interest among medical students and medical doctors. Recruitment of young scientists. Lack of platform for molecular pathology.

**Opportunities:**
Bio banking (large systematic collections of blood and tissue samples). Well developed networks enabling translational research. (CREATE Health). Regional and national Study Groups with specific aims. The very close connection to the Oncologic Clinic and Regional Tumour Registry.

**Threats:**
Lack of positions for post-docs. Lack of bioinformatics specialists and radiochemists. Academic positions for postdoc are scarce. Defragmented cancer care department. Clinical trial unit to be self sufficient which is in contrast to the desire to carry out more academic studies with poor funding. Problems to commercialize on a market focusing on fast increasing revenues.
Dept Oncology upholds strong research in genetic susceptibility for breast cancer and maintains an oncogenetic analysis service in Sweden (BRCA1 BRCA2 mutation screening). This represents an example of a successful clinical implementation of research activities – genetic linkage and BRCA gene analysis in familial breast cancer started as research projects in the early 90ties and has grown to national diagnostic service, now run in parallel with continued research. The group is participating in large international genetics consortia for association studies in breast cancer and malignant melanoma.
Another example of clinical implementation is the use of prognostic and treatment predictive factor in the management of breast cancer patients. This work, as well as ongoing research activities, is to a large extent driven in collaboration with other groups and we are also represented in the EORTC PathoBiology Group.

Research regarding early diagnostics and photodynamic therapy (PDT) of malignant tumours. PDT has been taken from laboratory work to routine clinical application what regards certain types of skin carcinomas, while interstitial PDT is now being studied for prostate cancer. The international standing of the research is illustrated by many publications, numerous invited talks, conference management as well as prizes and distinctions.

Clinical trials in lymphoma – coordinating more trials and recruiting more patients than any other centre in Sweden. Pioneers in radioimmunotherapy for lymphoma – first in Europe. The Swedish-Norwegian testicular cancer project, SWENOTECA is a binational clinical research collaboration which started 1981. Several clinical trials, (SW I-VII), have outlined the treatment of testicular cancer in the two countries. The impact of SWENOTECA is reflected in repeated Eurocare surveys of cancer survival in Europe where the survival of patients with testicular cancer in Sweden is 98.1%, topping the list. In focus today is research on late effects of cancer treatment as fertility, hypogonadism and cognitive function.

To improve tumour targeting of immunoconjugates, it requires reducing the fraction of uptake in sensitive vital organs; improving penetration through interstitial tissues; and evaluation of the internalization process in the tumour cells.
Immunocompetent rat models with syngeneic tumours have proven to reflect the clinical situation very well when evaluating tumour targeting. We have evaluated specific device to improve tumour-to-normal tissue in these animals and implemented various devices and strategies in clinical phase 1-2 studies ECAT. We have setup a modern high resolution bioimaging platform to quantify and localize internalized immunoconjugates. Pioneers by using PET facilities, the efficacy of therapy can be early predicted in pre- and clinical studies. PET and SPECT cameras mainly dedicated for clinical research are located at Dept of Oncology.

Collaborative Groups on Hormonal factors and Breast Cancer, Epidemiological studies of Ovarian Cancer, GenoMEL (melanoma genetics and BRCA-1 and -2 International Collaboration including work within the Breast Cancer Linkage Consortium and the IBCC cohort. Researchers from all over the world have joined forces under the auspices of UK Cancer Epidemiology Unit, Oxford (Sir Richard Peto, Sir Richard Doll, Valerie Beral) to study breast and ovarian cancer risk factors (oral contraceptives, HRT, alcohol, family history, abortions and pregnancies). Our department is participating both with a case control study and the big MISS cohort. The role of CDKN2A germline mutations has evolved into finding new melanoma genes through a genome wide search among families with melanoma. The findings have been published in very high ranked journals, are highly cited and are regarded as primary publications in each area.

- Targeted therapies of cancer: A major goal of cancer research is to improve the specificity of drugs for cancer cells. The development of targeted therapies of cancer represents one of the fastest growing areas in medicine, and more than 500 substances are currently in clinical trials. The term “targeted” could in this context have several meanings, e.g. cancer cell-specific delivery of a cytotoxic substance, or non-specific delivery of a substance that targets a pathway that is essential for cancer cell survival while dispensable for normal cells. Ideally, therapeutics of cancer should offer a combination of both, which is a major objective of our research. For example, in order to individualize the use of targeted breast cancer therapy, we will evaluate predictive factors in blood and tissue samples from patients participating in clinical trials in relation to treatment effects.

- Developments of unconjugated and conjugated immunoconjugates for therapy; new radiolabeled tracers for PET-investigations/therapy prediction. To visualize and follow biochemical processes.

- Prediction of early response to therapy making it possible to early change strategy of therapy.

- Carry out more academic clinical trials in cooperation with other departments at Lund university hospital including research departments for collaboration with translational research. With the start of the phase I unit it will be possible for new treatments developed in conjunction with research departments to be investigated.

- Studies of the joint effects from lifestyle, concomitant medications (including complimentary alternative medicine) and genotypes on
  1) response to oral contraceptives and risk for subsequent breast cancer
  2) response to breast cancer therapy.

Using registry data to find new familial cancer clustering for GWS studies in order to identify new genes of importance for cancer predisposition

Biomarker studies of blood in breast cancer to identify markers for risk, diagnosis and follow up (such as protein arrays and galectin expression).

- Developing methods for predictive analysis of targeted therapy in malignant disorders, e.g. breast cancer and lymphoma. We will further improve our routines for collecting blood and tissue samples, especially from patients participating in clinical trials.
- Optimizing therapy for testicular cancer – with minimization of long term adverse effects.


This paper describes a first clinical prototype for interstitial photodynamic therapy with integrated optical diagnostics and dosimetry feedback. The technique is developed together with the Atomic Physics Division and SpectraCure AB, and may be applicable for the management of a large variety of solid tumors.


2. Åke Borg: Vilka former av genetisk diagnostik finns eller kommer att finnas inom en snar framtid i Vetenskapsrådet "State of the science", 2003


5. Registerstudier över cancersjukdomar i södra sjuvkårdsregionen Rapport. 2007. Bo Attner, Dennis Noreen, Thor Lithman, Håkan Olsson


Helena Jernström:
www.forskning.se 2008-01-24-Olle Dalbäcks artikel från IKVL om H Jernströms forskning-Rätt medicin direkt - BROYästet

"Vissa naturläkemedel är olämpliga under behandling”
TT 2004 Amning halverar bröstcancerrisken hos BRCA1 bärare
2005 P-piller I tonåren ökar risken för tidig bröstcancer

2007 Länge amning av första barnet sänker prolaktinnivån - kan innebära minskad risk för bröstcancer


2. T. Svensson, E. Alerstam, M. Einarsdottir, K. Svanberg, and S. Andersson-Engels, Reliable and accurate in-vivo spectroscopy of the human prostate. J. Biophotonics (submitted) This paper reports on optical measurements in connection with brachy therapy of prostate cancer. The data on tissue optical properties are important for optimizing interstitial photodynamic therapy, now developed in collaboration with the spin-off company SpectraCure AB.


5. Karin Broberg, Maria Albin, Jonas Björk, Karin Schläwicke Engström Elizabeth Huynh, Christian Ingvar, Håkan Olsson*, Mattias Höglund*, Association between polymorphisms in RMI1, TOP3A, and BLM and risk of cancer (submitted) * both considered senior authors.

E Bågeman, C Ingvar, C Rose, H Jernström. Coffee consumption and CYP1A2*1F genotype modify age at breast cancer diagnosis and estrogen receptor status Cancer Epidemiology Biomarkers and Prevention 2008 in press

http://www.med.lu.se/klinvetlund/onkologi
http://www.med.lu.se/bmc/create_health
http://www.lth.se/sciblu/services/dna_microarrays/
http://www.flexibelutbildning.onk.lu.se/standard.asp?id=27
http://www.genomel.org/
http://www.med.lu.se/klinvetlund/onkologi/forsknings/publikationer

Forskningsdatabas: http://www.research.med.lu.se/sw_index.php?Sort=L&BMC=No&Institution=013230000

henrik.gronberg@ki.se
Heads of unit:  
Bo Baldetorp (57 y, male)  
Håkan Olsson (57 y, male)

Number of research active staff: 20

Research active staff:  
Bo Baldetorp (57 y, male), Professor  
Håkan Olsson (57 y, male), Professor  
Pär-Ola Bendahl (42 y, male), Researcher  
Åke Borg (54 y, male), Professor  
Mårten Fernö (56 y, male), Professor  
Ingrid Hedenfalk (39 y, female), Research Fellow  
Cecilia Hegardt (36 y, female), Research Fellow  
Helena Jernström (39 y, female), Researcher  
Göran Jönsson (31 y, male), Researcher  
Anders Kvist (39 y, male), Researcher  
Mef Nilbert (41 y, female), Professor  
Karin Rennstam (female, Post-doc researcher)  
Markus Ringnér (37 y, male), Researcher  
Carlos Rovira (49 y, male), Researcher  
Jan Tennvall (59 y, male), Professor  
Johan Vallon-Christersson (35 y, male), Research Fellow  
Sihe Zhang, Post-doc researcher  
Jan Degerfält (50 y, male), Senior Lecturer  
Elisabeth Kjellén, MD, PhD  
Kristofer Rubin, MD, PhD

Number of PhD students: 31
Number of PhD graduates (last 3 yrs): 14

PATHOLOGY

1. Topics of research areas are tumor pathology (sarcoma, breast and lymphoma pathology), neuropathology and cellular imaging. However, it is difficult to give a definite answer due to uncertainty of the future because of retirement of the present head and professor of pathology.

The research topics are organized in separate groups led by a senior researcher with a competence of a Swedish “docent”.

The research topics are well in line with the main topics and future research strategy and plans of the faculty.

2. Collaborations are established between research groups, as well within as outside the faculty, and between different faculties in Lund University, and between universities within and outside Sweden.

3. Infrastructure is based on advanced equipment for structural (tools for advanced microscopy) and molecular (molecular biological) analyses, handled by experienced and trained personnel.

Head of unit:  
Per Alm (65 y, male), Professor

Number of research active staff: 2

Research active staff:  
Per Alm (65 y, male), Professor  
Elisabet Englund, MD, PhD

Number of PhD students: 3
Number of PhD graduates (last 3 yrs):
1) Future plans for the next three years

Future development and research will be in the broad field of general surgery including also interdisciplinary work and oncological aspects. Three topics of specific interest are:

1. Pancreatic cancer – in vitro, in vivo and clinical studies. We are developing both local and international network on novel treatment based on increased knowledge of underlying pathophysiological mechanisms including molecular mechanisms and cellular signalling. This includes potentiation of present chemotherapy, decreasing chemotherapy resistance, development of novel modes of proliferation arrest, addressing the proinflammatory response frequently seen in pancreatic cancer (negative prognostic factor) and clinical implementation of multitarget treatment in addition to conventional chemotherapy.

2. Novel ways of intervention in multiple organ dysfunction with specific focus on acute lung injury. MODS and not at least ALI develop frequently also after various abdominal conditions. We have previously done substantial research in the field of acute pancreatitis and remote organ dysfunction. Essential is different ways to modulate the systemic inflammatory response and the further development of multiple organ dysfunction.

3. Abdominal adhesion prevention. By a novel concept based on differently charged polypeptides, we have demonstrated the efficient prevention of abdominal adhesions. This concept is to be further developed including toxicology, administration, and hopefully within the coming 3-year period bring it into initial clinical studies.

Organisation of research topics:

Research organization for the topics above is in the collaboration between the biomedical center and department of surgery where we have facilities both in the preclinical experimental world and clinical setting including international multi-institutional networks for all of the above mentioned areas. It is to be mentioned that for pancreatic cancer research we have an established collaboration with HPB Scandinavia (www.hpbscand.org), Fudan University, Zhongshan Hospital, Shanghai, China, and a coming affiliation in Zhongshao, Translational Sciences. This also goes for acute lung injury and we will this autumn create a world organization of organ dysfunction with Journal of Organ Dysfunction as the official organ. A newly created Biomedical institute within Clinical Sciences Lund with the above fields (www.med.lu.se/klinvetlund/csbmi)

Relation to the main topics of the faculty:
Oncology and clinical research are main fields of interest within the medical faculty.

2) Collaborations

The above mentioned, as well as other, topics have an established network both within the medical faculty, university hospital, Malmö, nationally (www.sfoak.se) and internationally.

3) Infrastructure

Core facilities:
Biomedical center – Laboratory facilities with in vitro (cell culture) and in vivo (animal experimental) facilities, and clinical (department of surgery), networks as mentioned above nationally, Scandinavian, and internationally. Research grants, PhD students, PhD’s in BMC, laboratory engineers, guest researchers.

Head of unit: Roland Andersson (52 y, male)
Number of research active staff: 3
Research active staff: Roland Andersson (52 y, male), Professor
Mats Ekelund (55 y, male), MD, PhD, Senior Lecturer
Bobby Tingstedt (41, male), MD, PhD
Number of PhD students: 13
Number of PhD graduates (last 3 yrs): 10