Karolinska Institutet

CLINTEC
Doctoral Theses 2016–2026

Department of Clinical Science, Intervention and Technology

www.clintec.ki.se

I touch
the future.
I teach.

Sharon Crista Corrigan McAuliffe (1948-1986)
was an American astronaut and became
the first teacher in space.

Contents

Some of the larger constellations (labs/groups) are presented under their respective division.

Karolinska Institutet CLINTEC

Creating new knowledge and improving clinical care is in the very core of CLINTEC, the Department of Clinical Science, Intervention and Technology. Through a unique blend of technology, translational science and bespoke interventions, together with the healthcare service, we keep the department on the forefront. With a strong, creative cross-disciplinary environment where education, research and technology meet medicine.

This environment is the foundation for hundreds of committed researchers striving for new insights, and with their relentless curiosity upholding the world-leading spirit.

Our aim is to nurture future leaders in education and research to deliver the next level of care in partnership with patients.

Integrating education, research and clinical care to improve health.

We are proud to present the doctoral and licentiate theses from CLINTEC 2016-2026.

Li Felländer-Tsai
Director of graduate studies

Olav Rooyackers
Director of graduate studies

Lars Henningsohn
Chairman

Division of Anaesthesia and Intensive Care

The Division of Anaesthesiology and Intensive Care conducts research and education around the critically ill patient undergoing major surgery or in the need of intensive care.

The research and education are performed in close collaboration with the Function Perioperative Medicine and Intensive Care at Karolinska University Hospital, mainly at the Huddinge site.

Most of our research is related to patient care and aims for the best clinical outcome by studying the patients and the personnel directly. However, we also perform pure translational research from the cell to the patient. The research team consist of two professors (one clinican and one basic scientist), several clinical researchers, basic scientists, clinical PhD students (clinicians, nurses and dieticians) and support staff (laboratory personnel and research nurses). We have close collaborations with renowned research groups locally and world-wide. Many of our researchers are active in international professional organisations as lecturers, teachers and organisers. The research at the division is mostly organised around three main research topics:

- A hemodynamic centre focussing on cardiac function during advanced anaesthesia and intensive care and AI to predict hemodynamic stability during major surgery.
- Patient safety and the role of the clinical team's collaboration on this.
- The metabolic adaptations during critical illness and how this possibly effect nutritional treatment strategies.

The research is supported by a central clinical research unit staffed with two research nurses and an analytical research laboratory. The clinical research facility guarantees high quality clinical studies according to Good Clinical Practice (GCP). The lab is specialised in the analyses of stable isotope tracers using mass spectrometry allowing us to quantify metabolic pathways in patients. But we also support the research with molecular techniques, histology, analytical chemistry and cell culture expertise. In addition to our own initiated research, we participate regularly in larger international observational and interventional trials.

Our teaching activities are mainly within the medical program during the regular curriculum for training in treating the acute severely ill patients during anaesthesia and intensive care. But we also organise an intensive course for medical students in applied physiology for the acute severely ill patients. In addition, we are active in the doctoral education by training clinical PhD student and organising a PhD course in research and researcher ethics.

Professor Olav Rooyackers
Head of Division

Division of Anaesthesia and Intensive Care
Doctoral theses and Licentiate theses (*) 2016–16 June 2026

Title	Author name	Publication year
Cardiopulmonary adaption to one-lung ventilation and neoadjuvant therapy during treatment of esophageal cancer	Lund, Mikael	2016
Interprofessional collaboration in the ICU: facilitating progress in teams of learners	Conte, Helen	2017
Perioperative glucose control	Blixt, Christina	2018
On bioenergetic failure in septic shock: lactate kinetics and mitochondrial respiration	Grip, Jonathan	2018
Teamarbete och informationsöverföring inom perioperativ vård: operationssjuksköterskans perspektiv *	Sandelin, Annika	2019
Anabolic response to amino acid supplementation in critical illness	Liebau, Felix	2019
The new old normal: reassessing perioperative oxygen consumption and haemodynamics in the elderly	Jakobsson, Julia	2020
Glutamine kinetics in critically ill patients	Smedberg, Marie	2020
Energy expenditure and substrate utilization during critical illness	Sundström Rehal, Martin	2020
Coagulation in liver failure : the role of thromboelastometry and fibrinogen	Dumitrescu, Gabriel	2020
Level with me! Exploring patient participation in short-term clinical encounters in team-based settings	Dubois, Hanna	2022

* Licentiate thesis

Division of Audiology

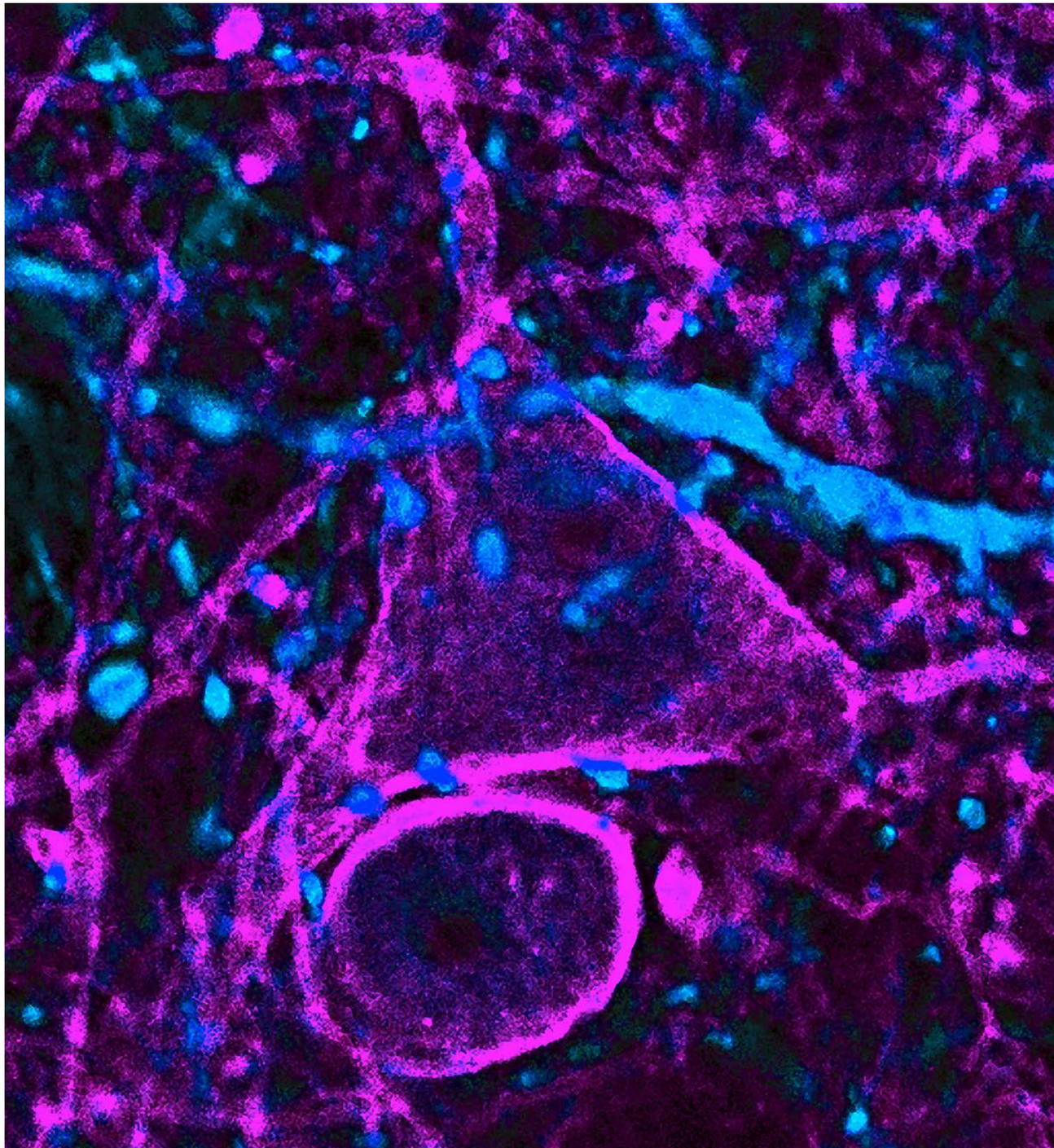
Audiology, the science of hearing, is a multi-disciplinary field that includes medicine, technology and behaviour science. The discipline covers expertise in hearing and balance and related conditions such as tinnitus and hyperacusis. Hearing deficits affects people of all ages and could be congenital or acquired.

Research
The research from the division spans over two decades and covers audiology, hearing screening, ototoxicity, neuroscience, noise exposure, and dual sensory impairment. It includes extensive work on newborn and childhood hearing screening, cost effectiveness modelling, and international programme evaluation. Research on cisplatin induced ototoxicity and protective treatments, including sodium thiosulfate and hydrogen gas, forms a major theme. Additional contributions address genetic susceptibility, automated audiometry, neural coding, tinnitus, ageing, and lived experiences of combined hearing and vision loss. Together, the publications reflect a broad and sustained contribution to clinical and experimental hearing science.

Education
The Division of Audiology offers a three- year bachelor study program leading to a licence to practice as an audiologist. The program focuses on neuroscience, anatomy and physiology of the auditory system and intervention of all types of hearing losses and other diagnosis that affects the auditory system such as tinnitus. The students are trained in several diagnostic methods for hearing assessments as well as in hearing aid fitting and other rehabilitation actions. The students participate both in clinical practice and advanced simulation tools.

Senior Lecturer Åsa Skjönsberg
Head of Division

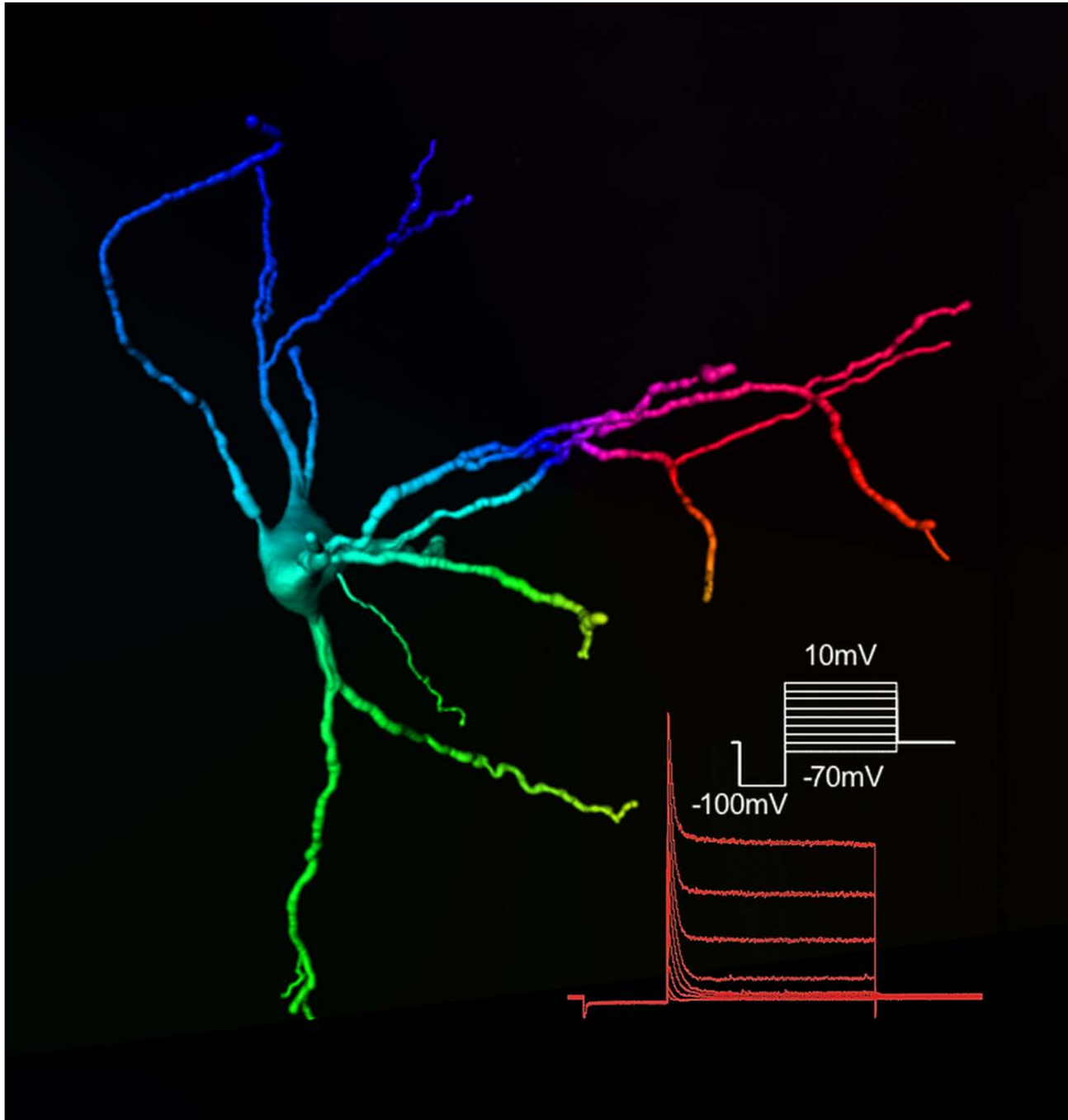
Every neuron in the brain connects to other neurons with extensions called axons. The signal is usually transferred between neurons via axonal nerve endings. Magnified neurons (magenta) in the auditory system are embedded in a matrix of excitatory nerve axons (blue).



Division of Audiology
Doctoral theses 2016–16 June 2026

Title	Author name	Publication year
Cellular correlates of sensory processing in the mammalian audio-vestibular brainstem	Leijon, Sara	2016
Longitudinal study of the impact on hearing from aging, genetic background and environmental exposures in male twins	Bogo, Renata	2017

By studying the electrical properties in neurons, we can increase our understanding of how the brain analyzes the world. Here, small currents (red trace) occur when the neuron´s voltage (white trace) changes. Such mechanisms trigger brief electrical discharges that enable neurons to "hear" the rhythm of speech and music.



Center for Cervical Cancer Elimination

Advancing the Science of HPV and Cancer Prevention

Our research spans both basic and translational studies of Human Papillomavirus (HPV), one of the world's most important tumor viruses. We investigate the biology of HPV and develop methods for HPV-based prevention, including screening and vaccination. As an international reference laboratory, we sequence, document, and archive all newly identified Papillomaviruses, ensuring global consistency in classification and data quality.

A National Hub for Cervical Cancer Prevention
In Sweden, our work extends to designing, implementing, and evaluating preventive strategies at the population level. We manage the national quality register for cervical cancer prevention, which enables continuous monitoring and improvement of screening programs. Through this infrastructure, we help ensure that evidence-based HPV prevention is effectively translated into public health practice.

Coordinating Sweden's Cervical Cancer Elimination Campaign
We initiated and coordinate the Swedish national campaign aimed at eliminating cervical cancer. This strategy focuses on two complementary pillars: accelerating population-level immunity through extended HPV vaccination, and increasing screening participation by offering HPV self-sampling. Together, these measures aim to achieve high coverage, reduce disparities, and move Sweden toward the goal of becoming one of the first countries in the world to eliminate cervical cancer.

Professor Joakim Dillner
Head of Division

Karin Sundström Group

Towards Improved Female Cancer Prevention

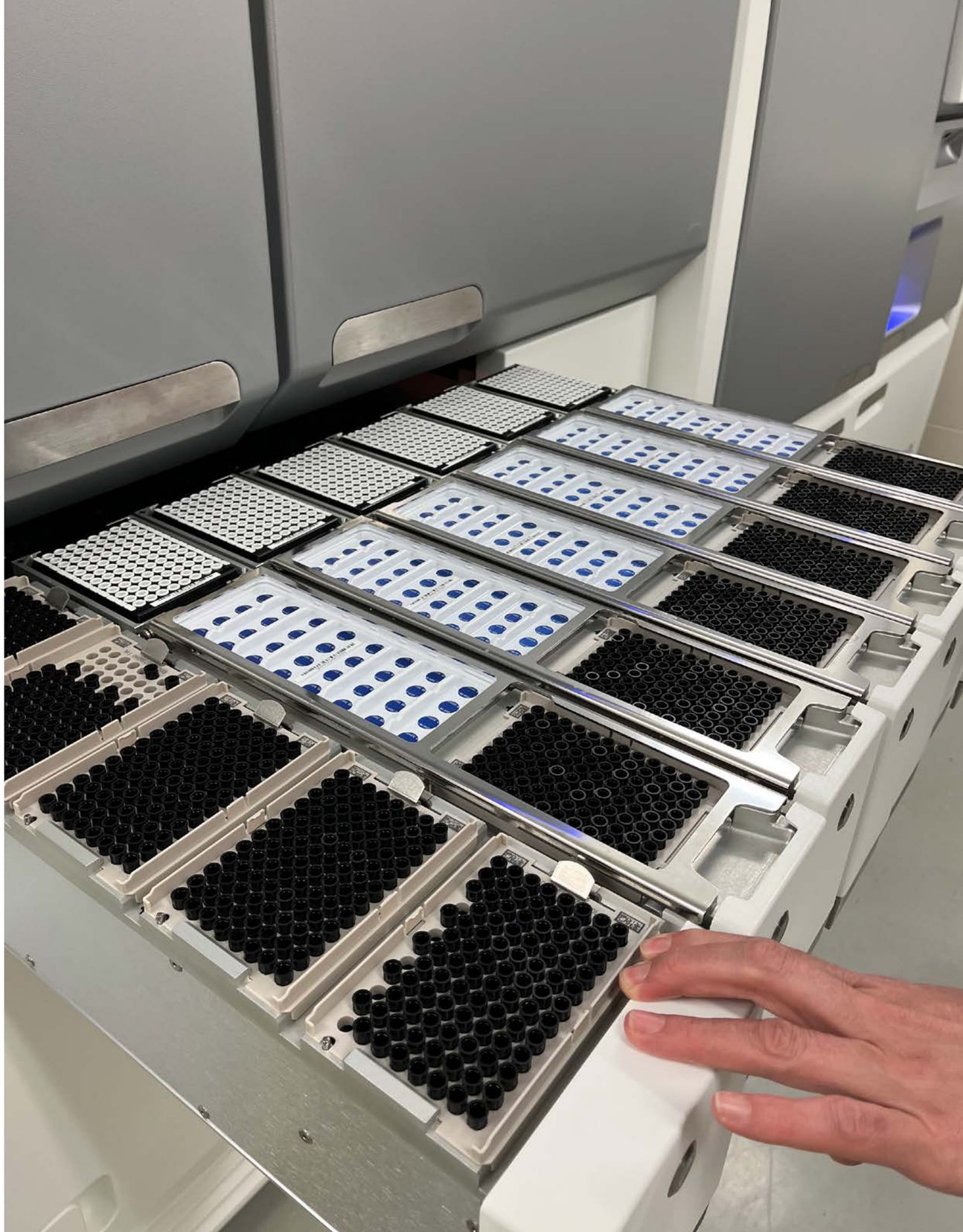
We Focus on Molecular Epidemiological Studies Conducted in the Excellent Swedish Register and Biobank Infrastructure.
Our main interests concern the elimination of female gynecological cancers:

1) Human papillomavirus (HPV)-associated cancers through virological research and improved cervical screening and HPV-vaccination practices.
2) Endometrial cancer, through research on epigenetics/ methylation, and improved diagnostics of post-menopausal bleeding.
3) Ovarian cancer, through research on risk factors and potential chemoprevention.

As such, we perform a comprehensive portfolio of projects in national health registers and large-scale clinical biobanks, which are unique resources for studies on biomarkers for female disease. Our chief international collaborators are Danish and Norwegian Cancer Societies, University of Tirol and University College of London.

Promising Tech-Molecular Approaches
Apart from molecular epidemiological studies, we have pursued in silico projects such as machine learning and text mining of medical records, for improved assisted prediction of screening-detectable cancer forms.

Principal Researcher Karin Sundström
Head of Group



Center for Cervical Cancer Elimination
Doctoral theses 2016–16 June 2026

The Center for Cervical Cancer Eliminiation was recently transferred to CLINTEC, thus the doctoral theses below were defended at the Department of Laboratory Medicine.

Title	Author name	Publication year
Infections in skin cancer	Sara Arroyo Muhr	2016
Machine learning and data-parallel processing for viral metagenomics	Zurab Bzhalava	2020
Vaccine effectiveness against HPV infections	Hanna Kann	2020
Human papillomavirus as a target for cancer prevention	Maria Hortlund	2021

Division of Ear, Nose and Throat Diseases

At the Division of Ear, Nose and Throat Disorders, research is closely tied to clinical reality. Our questions arise from everyday patient care and our aim is to turn those questions into knowledge that improves diagnosis, treatment and rehabilitation.

We have built a strong and growing research environment with just over 30 active PhD candidates. Most are ENT physicians in specialist training, but our group also includes engineers, biomedical scientists, audiologists and a smaller number of nurses. That mix matters. It allows us to approach clinical problems from several angles at once and creates a research culture where medical experience, technical expertise and biological insight work together.

In recent years, several colleagues have become Associate Professors (Docents) and more are moving in that direction. Our work is supported by grants from the Swedish Research Council, the Swedish Cancer Society, the Swedish Heart-Lung Foundation, the Radiumhemmet Research Funds, CIMED, ALF, Karolinska Institutet and private foundations. This gives us the stability to build long-term research programmes while also leaving room for new ideas and new methods.

Our research covers six main areas: head and neck oncology; allergic rhinitis and chronic rhinosinusitis with type-2 inflammation; hearing science; molecular and systems biology; skull-base and facial trauma and reconstructive surgery; and infectious and inflammatory ENT disorders.

Within these fields, we study disease mechanisms, diagnostics, prognosis, treatment outcomes and rehabilitation. Our projects range from tumor biology and immunological pathways to cochlear implantation, hearing rehabilitation, molecular analysis of cells and tissues, facial trauma, reconstructive surgery, mastoiditis, Bell's palsy, virus-related conditions and long-term sequelae after COVID-19.

What brings this work together is a shared way of thinking. We combine clinical materials, experimental methods and data-driven analysis within one research environment. This allows us to move between patient care, laboratory work and long-term follow-up in a way that strengthens both the science and its clinical relevance.

Our ambition is not only to keep pace with developments in ENT, but to contribute to them. By combining clinical anchoring, scientific curiosity and a strong doctoral training culture, we aim to generate knowledge that will make a real difference for future patients.

Professor Lars Olaf Cardell
Head of Division

Research in hearing science and cochlear implantation brings together advanced surgery, technological innovation and long-term rehabilitation.

Research on diseases of the nose and sinuses ranges from basic biological mechanisms to improved diagnosis and treatment.

Division of Ear, Nose and Throat Diseases
Doctoral theses and Licentiate theses (*) 2016–16 June 2026

Title	Author name	Publication year
Nicotine and endotoxin in airway hyperreactivity and inflammation	Xu, Yuan	2016
Determinants of hearing impairment in Swedish hunters: an e-epidemiological approach	Honeth, Louise	2016
Cochlear implantation: experimental and clinical studies	Smeds, Henrik	2016
Pediatric obstructive sleep apnea: evaluation of questionnaire and surgical treatment	Borgström, Anna	2017
Nasal epithelial cells: innate immunity and inflammation	Tengroth, Lotta	2017
Innate mechanisms in upper airway inflammation with focus on epithelium and neutrophils	Arebro, Julia	2017
Orbital blow out fracture: to operate or not to operate – that is the question	Alinasab, Babak	2017
Hormonal effect on the inner ear: two endocrine syndromes	Bonnard, Åsa	2017
Development of vestibular evoked myogenic potentials and audiometry for the clinical diagnosis of superior canal dehiscence syndrome	Verrecchia, Luca	2018
Immune response and tumour cell detection in lymph nodes of head and neck cancer	Kågedal, Åsa	2018
Inverted papilloma and sinonasal malignancies in Sweden	Elliot, Alexandra	2018
Auditory organotypic cultures and progenitor cell implantation	Kaiser, Andreas	2018
Neutrophil subsets in airway inflammation and hyperreactivity	Ekstedt, Sandra	2019
Hearing in children with cleft palate*	Tengroth, Birgitta	2020
A personalized approach to chronic rhinosinusitis with nasal polyps: based on biomarkers, phenotypes and new surgical thinking	Jonstam, Karin	2020
Intralymphatic immunotherapy in allergic rhinitis: evaluating safety, efficacy and mechanisms	Hellkvist, Laila	2020
Surgical treatment of obstructive sleep apnea: randomized controlled studies in children and adults	Fehrm, Johan	2020
Effects of age and stimulation strategies on cochlear implantation and a clinically feasible method for sound localization latency	Eklöf, Martin	2020
Uvulopalatopharyngoplasty: patient selection, long-term outcomes and side effects	Sundman, Joar	2020
Neurophysiological conditions for hearing in children using hearing aids or cochlear implants: an intervention and follow-up study	Engström, Elisabet	2021
Complications due to acute rhinosinusitis in children	Hultman Dennison, Sofia	2021
Optimizing treatment: tumor markers and sclerotherapy in head and neck lesions	Wendt, Malin	2021
Adult patients with severe-to-profound hearing impairment: a clinical, register-based, and interview study	Turunen-Taheri, Satu	2021
Clinical use of prognostic markers in head and neck cancer	Landin, David	2022
Students' and supervisors' experiences of supervision and training in clinical learning environment	Sellberg, Malin S	2022
Allergic rhinitis and intralymphatic vaccination: immune response and tolerance	Hjalmarsson, Eric	2022
Perspectives on screening strategies for early detection of childhood hearing impairment	Mackey, Allison	2022
Children with congenital unilateral sensorineural hearing loss: etiology, newborn diagnostics and hearing aid amplification	Johansson, Marlin	2023
Airway hyperresponsiveness and viral recognizing toll-like receptors	Starkhammar, Magnus	2023
Growing up with one ear: central auditory structure and function in unilateral ear canal atresia	Siegbahn, Malin	2023
Tumour-draining lymph nodes in head and neck cancer: immunological signatures and clinical implications	Piersiala, Krzysztof	2024
Prioritization of mechanisms and potential biomarkers in inflammatory and malignant diseases	Zhao, Yelin	2024
Bell's palsy in pregnancy and puerperium	Lansing, Lovisa	2025
System-level approaches for biomarker discovery in complex and malignant diseases	Smelik, Martin	2025
Tympanic membrane regeneration: clinical and experimental human studies	Sepehri, Elnaz	2025
Facial nerve palsy and Lyme neuroborreliosis in children: treatment and outcome	Árnason, Sigurður	2025
Zygomaticomaxillary complex fractures: aspects of diagnosis, treatment and sequelae	Rhabin, Samin	2025
Executive function, word fluency and metaphor comprehension in young people with cochlear Implants	Malin Dahlby Skoog	2026
Immunologic Characterization of Tumor-Draining Lymph Nodes in Head and Neck Squamous Cell Carcinoma	Vilma Liljeström	2026
Development of objective balance tests in newborns and young children	Niki Karpeta	2026
Bilateral Auditory Implants and Spatial Hearing	Fatima Moumèn Denanto	2026
Predictors of upper airway symptoms and allergic disease in the BAMSE birth cohort	Karin Åberg	2026
FILLING THE GAPS IN UPPER AIRWAY INFLAMMATION: Neutrophils in Nasal Polyps, Immunotherapy and T Cell Glycosylation in allergic rhinitis	Maryam Jafari	2026

* Licentiate thesis

Division of Obstetrics and Gynaecology

The Division of Obstetrics and Gynaecology performs cutting-edge clinical and translational research in Maternal-Fetal Medicine, Human Reproduction, Embryonic Development and Stem Cell Therapy.

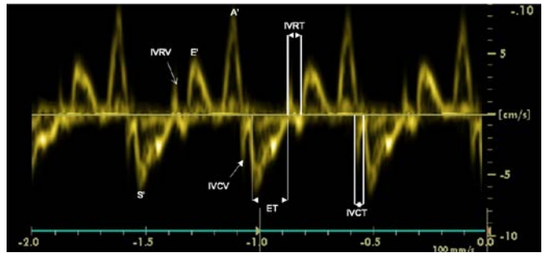
Research and Collaboration
The Division of Obstetrics and Gynaecology hosts several research groups working in the field of Embryonic and fetal Medicine, High-risk pregnancy, Human Developmental Biology, Teratology, Stem Cell Therapy, Gynaecology and Reproductive Medicine. We have easy access to modern laboratories, research infrastructure, and core facilities. A significant strength is a close collaboration between clinicians and scientists facilitating translation of research findings into clinical practice. A proximity to the KTH Royal Institute of Technology provides a platform for a meaningful interaction and collaboration in the field of technological innovations including supervision of postgraduate students offered in a joint doctoral programme in Medical Technology, allowing for a combined PhD degree from both universities. The research environment in our division offers substantial expertise and competence in periconceptional health, advanced in vitro models to study human pre- and post-implantation embryology, teratology and disease mechanisms (e.g. implantation failure/miscarriage, endometriosis), as well as clinical studies on advanced precision prenatal diagnosis & therapy of fetal red blood cell and platelet alloimmunization, diagnosis and management of complications of pregnancy/labour (e.g. preeclampsia, fetal growth disorders, placental dysfunction, fetal hypoxia, infections, birth asphyxia, maternal injuries associated with childbirth etc) and long-term consequences of adverse in utero exposures. We have strong national and international networks built through clinical alliances, research collaborations and joint educational activities.

Interprofessional Medical Education
The Division of Obstetrics and Gynaecology has the responsibility for the theoretical and practical education, clinical rotation and evaluation of approximately 80 medical students per year. We provide research opportunities and supervision for undergraduate and postgraduate students as well as for physicians and midwives. The division is also involved in medical education research and committed to improving standards in teaching and learning promoting good clinical practice by implementing evidence-based pedagogic methods and effective clinical supervision.

Professor Ganesh Acharya
Head of Division

Fetal Myocardial Velocities and Cardiac Cycle Time Intervals Measured by Spectral Pulsed-wave Tissue Doppler Imaging of the Fetal Heart.

E': Myocardial velocity during early ventricular filling; A': Myocardial velocity during late ventricular filling following atrial contraction; S': Myocardial velocity during Ventricular systole; ET: Ejection time; IRV: Isovolumic relaxation velocity; ICV: Isovolumic contraction velocity; IVRT: Isovolumic relaxation time; IVCT: Isovolumic contraction time.



Cecilia Götherström Group

Cecilia Götherström's research focuses on developing mesenchymal stem cell (MSC) therapies for children affected by severe Osteogenesis Imperfecta (OI), also known as brittle bone disease. She has pioneered the use of fetal MSCs, which have strong bone forming and immunomodulatory properties, to strengthen fragile bones, improve growth and reduce fractures in children with OI.

As the leader of the BOOSTB4 project and trial, she manages the first trial in the world to evaluate both prenatal and postnatal MSC administration for OI. This work explores the potential of MSCs to modify the course of the disease by reducing fractures and supporting healthier skeletal development from the earliest stages of life.

Through her translational research, Götherström aims to establish MSC based therapy as the first effective treatment option for OI, bringing new hope to affected children and their families.

Associate Professor Cecilia Götherström
Head of Group

BOOSTB4
Boost Brittle Bones Before Birth

Fredrik Lanner Group

Fredrik Lanners lab focuses on understanding how the earliest human cell types form and how this knowledge can be used to develop new stem cell-based therapies. By combining embryo research with advanced stem cell technologies, the lab aims to translate fundamental developmental insights into treatments for diabetes and blindness.

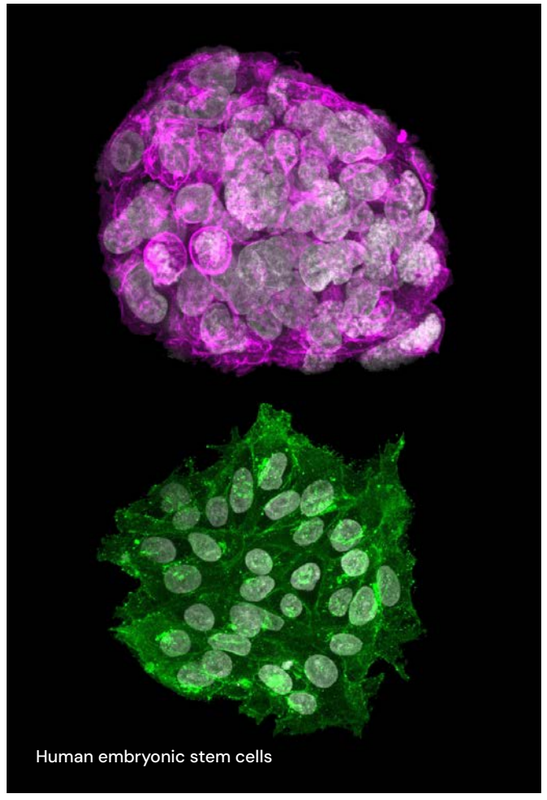
Understanding Early Human Development
The lab investigates the earliest stages of human development to uncover how the first cell types in the embryo are established. By studying embryos from the morula stage through blastocyst development, implantation and early gastrulation, the team aims to reveal the fundamental principles that guide the transformation of a single fertilized egg into an organized embryo. To achieve this, they use genome editing, multiomic technologies, advanced embryo culture systems as well as stem cell-based embryo models that mimic early developmental processes.

Stem Cell Based Treatment of Diabetes
The team is developing stem cell derived approaches to treat diabetes. Their work focuses on establishing efficient methods to generate glucose responsive pancreatic islets with the appropriate cellular composition as well as scaling manufacturing capabilities for clinical scale. These efforts aim to enable future cell based therapies capable of restoring natural insulin production in patients with diabetes.

Stem Cell Based Therapies for Blindness
The lab is working to develop new treatments for eye diseases through stem cell based strategies.

Age related Macular Degeneration (AMD): During more than 10 years of collaborative research with St Eriks Eye hospital, they have developed the differentiation protocol, undertaken clinical manufacturing human embryonic stem cell derived retinal pigment epithelial (RPE) cells and completed preclinical toxicology and functionality testing. Supported by the Erling Persson Foundation, they are preparing for a first in human clinical trial. The lab is now also developing efficient methods to produce photoreceptor cells, the light sensing cells of the retina. These could be transplanted alone or together with RPE cells to provide future treatment options for different forms of retinal degeneration.

Professor Fredrik Lanner
Head of Group



Human embryonic stem cells

Andres Salumets Group

The Reproductive Medicine Research Group, led by Prof. Andres Salumets and Assistant Prof. Alberto Sola Leyva, was established in 2020 with the shared goal of understanding how human life begins and develops. Our research spans the earliest stages of reproduction, from oocyte maturation and the first steps of embryo development to the complex communication between the embryo and the uterus that enables implantation and supports fetal growth. When these finely regulated processes do not function as expected, infertility and pregnancy loss may occur, highlighting the need for deeper biological insight. Motivated by scientific curiosity and a commitment to improving reproductive health, our team applies advanced multiomics, in vitro modelling and computational approaches, to develop better diagnostic and treatment strategies for female reproductive healthcare, including embryo quality assessment in assisted reproduction, evaluation of uterine biology and pregnancy monitoring. These innovations have already contributed to improved screening and clinical care and the opportunity to help couples achieve a healthy pregnancy continues to inspire and drive our work.

Professor Andres Salumets
Head of Group

Stem cell-based embryo model

Division of Obstetrics and Gynaecology
Doctoral theses 2016–16 June 2026

Title	Author name	Publication year
Automated analysis of fetal cardiac function: a new approach based on tissue Doppler imaging	Herling, Lotta	2018
Perinatal regenerative medicine: development of autologous constructs for soft tissue defects	Ekblad, Åsa	2018
Complicated vacuum extraction: focus on traction force	Pettersson, Kristina	2018
Exploring the role of mesenchymal stromal cells in endometriosis	Abomaray, Fawaz	2018
Massive transfusion in relation to obstetric hemorrhage: with special attention to placenta accreta	Thurn, Lars	2019
Scalable, safe and GMP-compatible production of embryonic stem cell derived retinal pigment epithelial cells	Padrell Sánchez, Sara	2020
Exploring mammalian preimplantation development and pluripotency	Schell, John Paul	2020
Developmental insights and biomedical potential of human embryonic stem cells: modelling trophoblast differentiation and establishing novel cell therapies for age-related macular degeneration	Plaza Reyes, Álvaro	2020
The human ovary: a characterization of cell types and adverse ovarian side effects of chemotherapy	Wagner, Magdalena	2020
Fewer kids not always by choice: the link between endocrine-disrupting chemicals and female reproductive health	Duque Björvang, Richelle	2021
Exploring early development and regenerative medicine using CRISPR/Cas9	Winblad, Nerges	2022
Pelvic floor dysfunction after childbirth: symptoms, diagnosis, treatment	Rotstein, Emilia	2022
Chronic pain related to childbirth: prevalence, characteristics, women's experiences about its impact and support from healthcare	Molin, Beata	2022
Traction force and long-term outcome in children born after vacuum-assisted delivery	Romero, Stefhanie	2022
Immune cell composition and cytokine expression in the pregnant and non-pregnant uterus	Crona Guterstam, Ylva	2023
Targeting the ovary: mapping mechanisms to link endocrine-disrupting chemicals to female fertility	Li, Tianyi	2024
Developing an embryonic stem cell-based cell product for age-related macular degeneration	Baqué Vidal, Laura	2024
Delineating cell types and toxicity in human ovaries from birth to sexual maturity	Hassan, Jasmin	2024
Superior vena cava blood flow in normal and growth restricted fetuses	Stefopoulou, Maria	2024
Analysis of cell type-specific adverse effects in ovaries	Panagiotou, Eleftheria Maria	2025

Division of Orthopaedics and Biotechnology

The Division of Orthopaedics and Biotechnology combines education and research in a multidisciplinary and interprofessional creative environment.

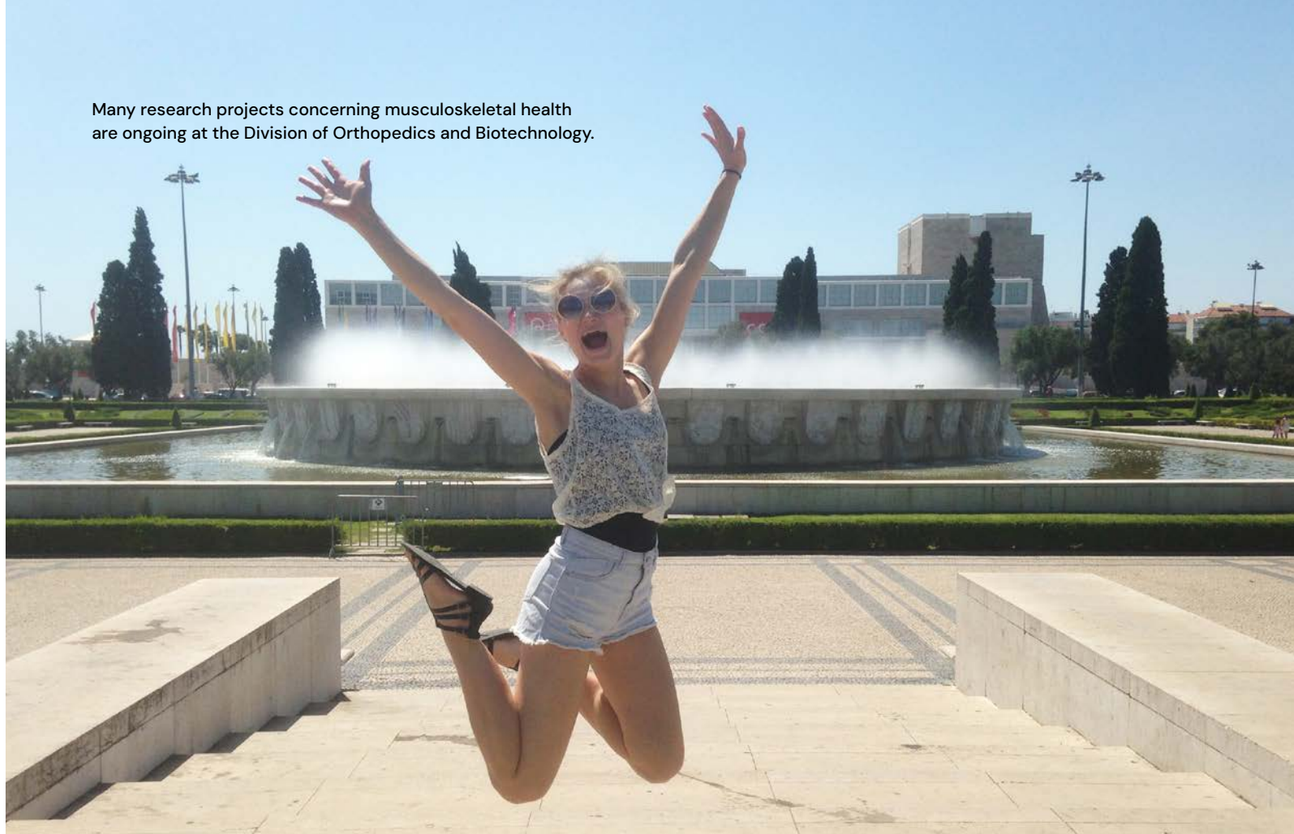
International Leadership
The Division of Orthopaedics and Biotechnology has, since its inauguration in 1973, rapidly grown and gained both national and international recognition. Between 2016 and 16 June 2026, 19 doctoral theses have been completed and defended at the division.

Researchers at the Division of Orthopaedics and Biotechnology enjoy a strong legacy of leadership in national, Nordic and international societies in orthopaedics, sports medicine and spine surgery. Researchers at the division have had a strong impact on national quality registers in cruciate ligament surgery, traumatology, joint replacement and spinal disorders.

Translational Research and Collaborations
The research at the Division of Orthopaedics and Biotechnology is focused around injuries and diseases affecting the musculoskeletal system, as well as advanced technology. The research has a translational approach ranging from basic science to epidemiology. Ongoing clinical trials include treatment of of humerus fractures, forearm fractures, hip fractures, knee osteoarthritis and hip- and knee arthroplasty. Other projects involve tendinopathy research, joint physiology, osteoporosis, genetics in scoliosis, biomechanics, simulation, new implants, robotics- and AI as well as epidemiological research of common fractures and joint injuries. The latter involves both national quality registers and patient registers. There are several Nordic multicenter collaborations.

Interprofessional Education with Advanced Technology
The Division of Orthopaedics and Biotechnology gives courses in basic orthopaedics and traumatology for medical students, as well as graduate education and national courses for residents in orthopaedics. There is strong focus on interprofessional education and the clinical education ward (KUA) trains medical, nursing, physiotherapy and occupational therapy students together in an orthopaedic ward. The Division of Orthopaedics and Biotechnology also integrates advanced, state of the art simulation and visualization technology in training.

Professor Li Felländer-Tsai
Head of Division



Many research projects concerning musculoskeletal health are ongoing at the Division of Orthopedics and Biotechnology.

Aquisition of arthroscopic skills in a virtual reality simulator.

The Division of Orthopaedics and Biotechnology
Doctoral theses 2016–16 June 2026

Title	Author name	Publication year
Focal knee resurfacing: a translational study in sheep on the treatment of focal condylar cartilage lesions with metal implants	Martinez-Carranza, Nicolas	2016
On lumbar disc herniation: aspects of outcome after surgical treatment	Elkan, Peter	2017
Cruciate ligament injury: crunching the numbers	Nordenvall, Richard	2017
ACL injury and surgery: aspects on function, muscular morphometry and effusion	Lindström, Maria	2017
Field studies in simulation-based team training	Escher, Cecilia	2018
Aspects of fracture risk in elderly women	Wihlborg, Axel	2018
Achilles tendon loading and deformation during rehabilitation and use of ankle foot orthoses	Fröberg, Åsa	2018
Outcome after surgery for isthmic spondylolisthesis and degenerative disc disease	Endler, Peter	2019
Quality of life, physical activity and bone health in idiopathic scoliosis	Diarbakerli, Elias	2019
Different perspectives of living with osteoarthritis and outcomes after knee arthroplasty	Skogö Nyvang, Josefina	2020
Long term effects of lumbar disc herniation surgery in adolescents	Lagerbäck, Tobias	2020
Fracture healing, functional outcome and health related quality of life in younger patients with a femoral neck fracture	Campenfeldt, Pierre	2020
Idiopathic scoliosis: aspects on surgical and non-surgical treatment	Charalampidis, Anastasios	2023
Mesenchymal stem cell regeneration and differentiation after anti inflammatory drug exposure	Kumlin, Maritha	2023
Perspectives on metal-on-metal hip resurfacing	Oxblom, Alexander	2024
Hip fractures in an aging population: clinical and epidemiological aspects	Greve, Katarina	2024
Revise and remember: managing hip resurfacing implant recall	Bitar, Christian	2025
Polytrauma patients: epidemiology and outcome	Holtenius, Jonas	2025
Understanding Knee Arthroscopy - Biomarkers, Pain and Socioeconomic Determinants	Lukas Berglund	2026

Joint replacement surgery of the knee augmented with navigation and robotics.

Division of Paediatrics

At the Division of Paediatrics research and education on the whole spectrum of diseases from birth to adulthood have been developed in close collaboration with the different clinical subspecialities in the field.

Research Areas
Since clinical Paediatrics was established at the former Huddinge Hospital half a century ago, the division has encouraged and fostered a large number of PhD students. This has resulted in an increasing number of dissertations per year, with 38 recorded during the last decade and currently some 25 registered PhD students.

Paediatrics, i.e. child and adolescent medicine, is a broad specialty with several subspecialist areas within Karolinska Institutet and Karolinska University Hospital. The specialty deals with all medical health problems from the newborn period to the age of 18 years and sometimes onwards. In fact, the weight of paediatric patients can range from less than 0,5 kg in an extremely premature newborn to over 150 kg in an obese adolescent patient.

Within the division of Paediatrics, clinical, translational and epidemiological research is carried out within the subspecialty areas that characterize the medical activities of Astrid Lindgren's Children's Hospital at Karolinska University Hospital, Huddinge. This includes paediatric gastroenterology, hepatology and nutrition, paediatric nephrology, paediatric hematology, neonatology, emergency paediatrics and child abuse, paediatric neurology, paediatric obesity, paediatric allergology, paediatric pulmonary medicine, as well as children with HIV infection and cystic fibrosis. Several studies primarily driven from our division are carried out in collaboration either with other divisions at CLINTEC, for example transplantation and obstetrics & gynecology, or within national or international registries.

Education
The division has an extensive educational activity with four 10 weeks courses in paediatrics in the medical program semester 10 and elective course in semester 11. Additionally one post graduate course in paediatric obesity for paediatricians and nurses and subspecialty courses in emergency paediatrics and paediatric nephrology for clinical residents in paediatrics are given.

Adjunct Professor Björn Fischler
Head of Division

Decidua stromal cell emerging from placental membrane.
Sadeghi

Cellular consequences of preterm birth.
Henckel

Conference presentation Mothers on Medications.
Nilsson, Heinonen

Division of Paediatrics
Doctoral theses 2016–16 June 2026

Title	Author name	Publication year
Elevated fasting glucose levels in obese children and adolescents: prevalence and long-term consequences	Hagman, Emilia	2016
Fetal exposure to neurotropic drugs: neonatal effects and long-term outcome	Forsberg, Lisa	2016
Early cardiovascular risk markers and cardiac function in children with chronic kidney disease	Tranæus Lindblad, Ylva	2016
Early obesity: family-based risk factors and treatment interventions	Ek, Anna	2016
Cardiovascular development of the preterm infant	Schubert, Ulf	2016
Non invasive ventilation in people with cystic fibrosis	Rodriguez Hortal, Cecilia	2016
Consequences of preterm birth on lung function, physical activity and exercise capacity	Svedenkrans, Jenny	2017
Evidence based care of the very preterm infant: studies on thermal care and breastfeeding in Europe	Wilson, Emilija	2017
Antenatal corticosteroid exposure: studies on neonatal and long term outcome	Norberg, Hanna	2017
Optimized growth and reduced morbidity in preterm infants: focus on nutrition and saturation targets	Klevebro, Susanna	2018
Mode of delivery, epigenetic modulation and immune cell formation at birth	Schlinzig, Titus	2018
Cardiovascular function in 6-year-old children born extremely preterm	Mohlkert, Lilly-Ann	2018
Exposure to hepatitis C virus early in life: epidemiological and Immunological aspects	Psaros Einberg, Afrodite	2018
Investigation of cytogenetic markers in neonatal blood spots and of aberrant protein expression in bone marrow from children with leukemia	Mattsson, Kristin	2018
Nutritional intakes over time and perioperative nutrition in extremely preterm infants	Westin, Vera	2018
Cellular consequences of preterm birth: telomere biology, immune development and oxidative stress	Henckel, Ewa	2018
The role of thyroid stimulating hormone receptor and novel candidate genes FAM13a and POM121c in adipocyte dysfunction	Lundbäck, Veroniqa	2018
Music therapy: an intervention effecting quality of life and health in children going through hematopoietic stem cell transplantation	Uggla, Lena	2019
Cardiovascular health in children and adolescents with obesity: prevalence, prediction and supervised exercise	Hedvall Kallerman, Pernilla	2019

Title	Author name	Publication year
Off-label drug use, medication errors and adverse drug events: among Swedish pediatric inpatients	Nydert, Per	2020
Sleep and obesity in children at different obesity risks: patterns, associations and early intervention	Xiu, Lijuan	2020
Every bug counts: neonatal colonization and infection of Gram-negative bacilli: aspects on antibiotic resistance in Sweden and Ecuador	Nordberg, Viveka	2020
Acute gastrointestinal graft-versus-host disease in allogeneic hematopoietic stem cell transplanted children and adolescents: clinical aspects of histopathological evaluation and risk factors	Mårtensson, Thomas	2020
Obesity in childhood: psychosocial consequences and premature mortality	Lindberg, Louise	2020
To cut or not to cut: the association between weight loss and cardiometabolic health in adolescents and adults after Roux-en-Y gastric bypass	Brissman, Markus	2021
Insulin resistance in children and adolescents: mechanisms and clinical effects	Ek, Anna E	2021
Cholestasis in infants at risk	Teng, Jonas	2021
Antisecretory factor in the perinatal period	Gustafsson, Anna	2021
Biomarkers and outcome in children with hypoxic ischemic encephalopathy	Finder, Mikael	2021
Psychotropic drug treatment during pregnancy and lactation: effects on mother and child	Whaites Heinonen, Essi	2022
Long-term outcome after hypothermia-treated hypoxic-ischaemic encephalopathy	Robertsson Grossmann, Katarina	2022
Mobile health interventions and cardiorespiratory fitness in pediatric obesity	Johansson, Linnea	2022
Physical activity and obesity prevention in early childhood	Bergqvist-Norén, Linnea	2022
Fungal colonization and infection in cystic fibrosis: prevalence, consequences and intervention	Al Shakirchi, Mahasin	2022
Efavirenz therapy in children living with HIV: the role of pharmacogenetics for plasma level variation and treatment results	Soeria-Atmadja, Sandra	2024
The liver in pediatric obesity: risks and consequences of increased transaminases and steatotic liver disease	Putri, Resthie Rachmanta	2024
Parental experiences of therapeutic hypothermia in their newborns and quality of life of the children in early adolescence	Kokkonen Nassef, Sari	2025
Everyday life in early adolescence after hypothermia-treated neonatal hypoxic-ischaemic encephalopathy	Eriksson Westblad, Mimmi	2025

Division of Radiography

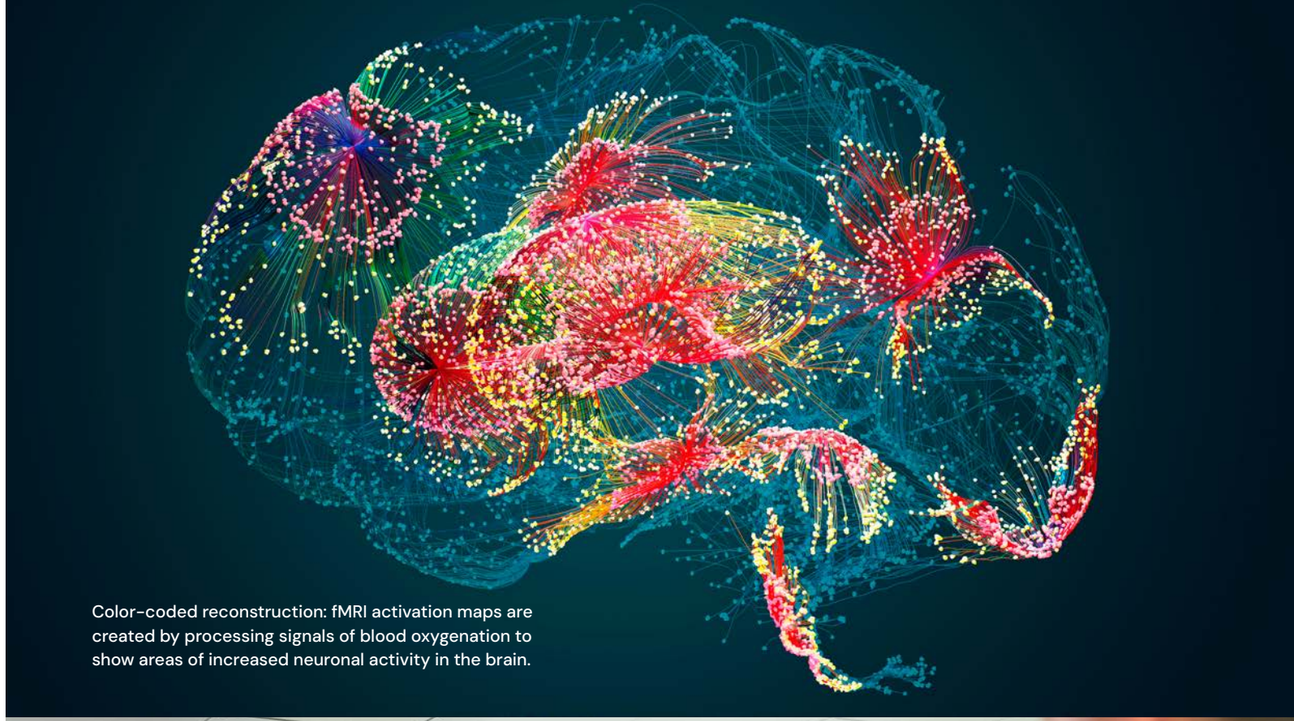
International Leadership
Research at the Division of Radiography is conducted in a multidisciplinary and interprofessional environment that involves several professions and focuses on technological development, workflow efficiency and patient safety. The findings from the doctoral and licentiate theses show that increasing complexity in healthcare systems requires improved coordination and communication, while technological advancements enhance diagnostic accuracy, workflow efficiency and patient safety. In addition, hygiene research demonstrates the importance of adherence to infection control routines, as factors such as stress and time pressure may negatively affect compliance and increase the risk of contamination.

Translational Research and Collaborations
Research at the Division of Radiography contributes to innovation and the integration of advanced imaging technologies. Current developments emphasize achieving the best possible diagnosis regardless of where the patient seeks care, as well as improving accessibility. Imaging enables earlier diagnosis, supports treatment decisions and allows monitoring of disease progression.

Key research areas include the optimization of imaging techniques and the integration of imaging data with patient-specific information. This multidisciplinary work involves close collaboration between clinical practice, research and technology, with radiographers playing a crucial role in linking technical development to patient care. Research on bacterial growth across different imaging modalities can be regarded as a combination of basic and applied research, as it both advances fundamental understanding and supports practical clinical applications.

Interprofessional Education with Advanced Technology
The Division of Radiography offers undergraduate courses in radiographic methods, medical imaging, anatomy, physiology, pathology and radiation physics, with clinical training in modalities such as X-ray, computed tomography, magnetic resonance imaging, and nuklearmedicin. There is a strong focus on patient care, communication, ethics and patient safety. At advanced level, courses include computed tomography, magnetic resonance imaging, scientific theory and methodology and a degree project, further developing competence in advanced imaging and evidence-based practice. Rapid medical development in imaging has increased the need for interprofessional collaboration and competencies across both technical and clinical domains, alongside person-centered care. Looking ahead, radiographers will continue to take on more research-oriented and participation in multidisciplinary teams, contributing to the safe and effective use of advanced imaging technologies and supporting improved patient care in an increasingly technology-driven healthcare system.

Lecturer Parvin Tavakol Olofsson
Head of Division



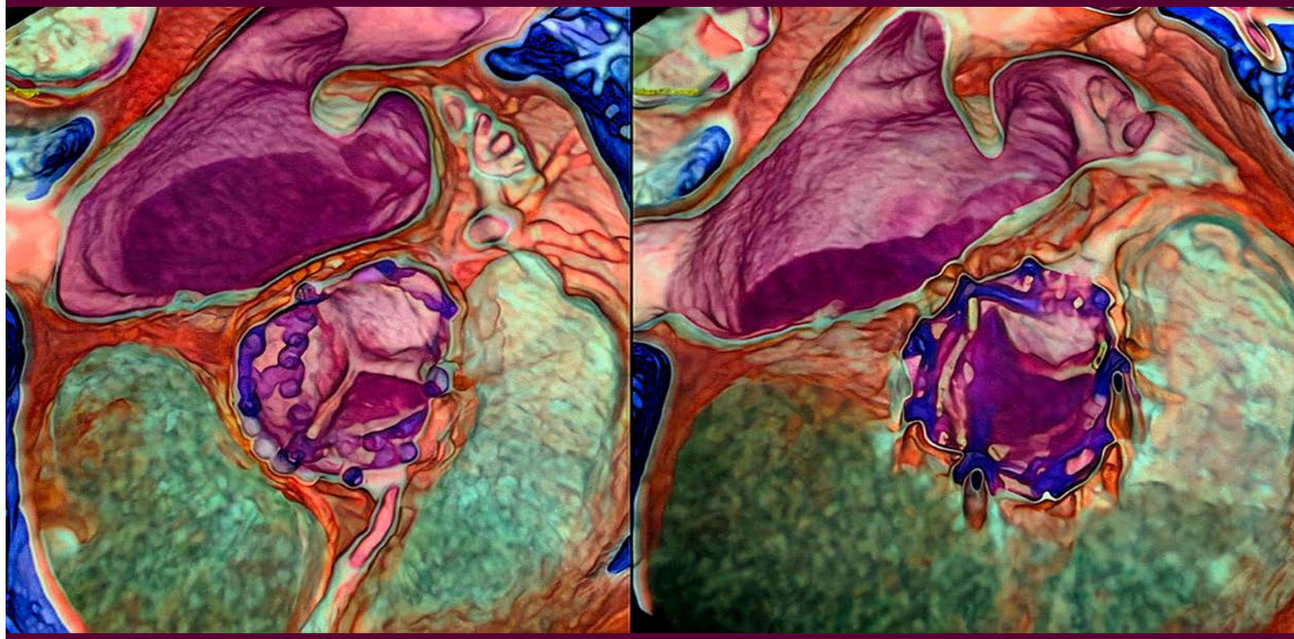
Color-coded reconstruction: fMRI activation maps are created by processing signals of blood oxygenation to show areas of increased neuronal activity in the brain.

Division of Radiography
Doctoral theses and Licentiate theses (*) 2016–16 June 2026

Title	Author name	Publication year
Consequences of outsourcing referrals for radiological examinations	Tavakol Olofsson, Parvin	2016
The dependency of image quality on acquisition protocol and image processing in chest tomosynthesis *	Jadidi, Masoud	2019
Hygiene at CT and MRI *	Palmqvist, Charlotte	2020

* Licentiate thesis

Image from CT angiography of the heart



Division of Radiology

Thoraco-Abdominal Radiology
Most of the radiologists and several of the radiographers are PhD:s or PhD students. Medical students are taught in radiology concepts during their fourth semester and to evaluate radiology images during their seventh. Cardiac imaging is the main focus of the thoracic unit, where improved visualization of the coronary arteries and the cardiac valves, as well as quantification of calcifications are a core. The main focus of the abdominal group is visualization and improved prediction models of primary hepatic cancer and biliary inflammation, evaluation of pancreatic cysts and adenocarcinoma, well in line with Karolinska Huddinge being a tertiary centre for hepato-biliary and pancreatic surgery. The optimization of contrast media, patient comfort and radiation dose are other important fields of interest.

Nuclear Medicine and Medical Physics
The division operates in a uniquely interdisciplinary setting where nuclear medicine physicians, radiologists, medical physicists, radiochemists, and data scientists collaborate closely. Medical physics plays a central role across all activities, from dosimetry and optimisation to image quantification and AI-driven analysis.

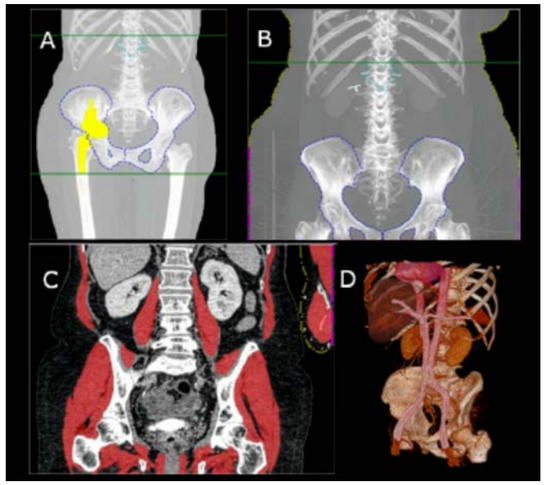
The Nuclear Medicine Department at Karolinska University Hospital Huddinge represents an integrated environment where clinical imaging, radiopharmaceutical development, and translational research converge. In close collaboration with the Theranostics Trial Center (TTC), the unit has evolved into one of the leading platforms in Scandinavia for precision imaging and theranostics.

Education is a core mission. We are actively involved in training medical students and physicists, residents and PhD candidates. Together, we aim to advance precision medicine by integrating imaging, biology, and technology to improve patient outcomes.

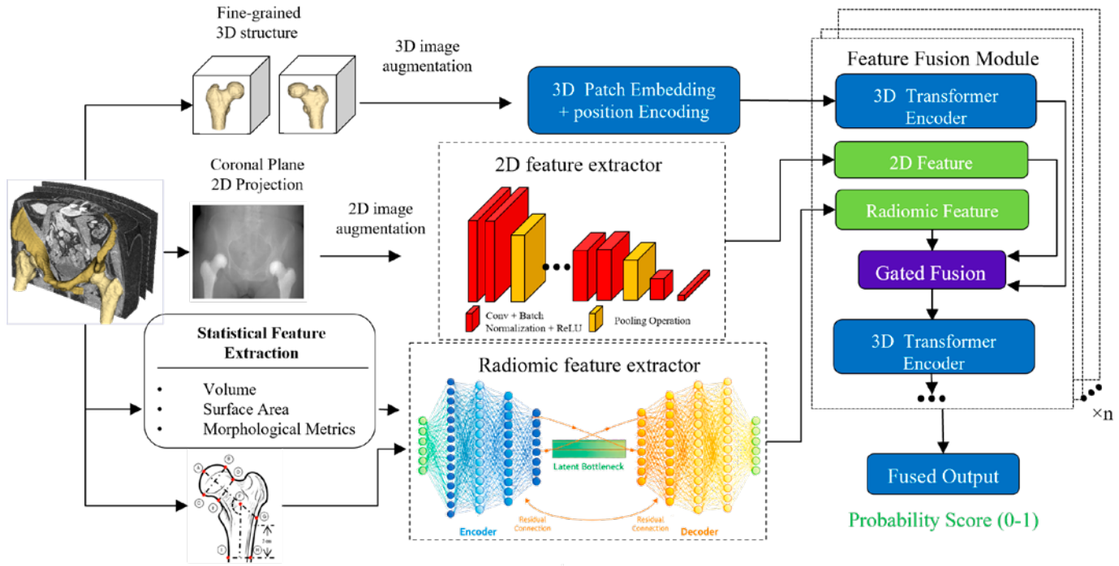
AI-Group
The use of AI in radiology is developing exponentially. We currently have a group of 5 AI computer scientists and 2 radiologists working full-time in developing and evaluating algorithms to better predict future fractures (osteoporosis), outcome after surgery (e.g. lever regeneration, morbidity and mortality in liver cancer), renal function and body composition (intensive care patients, dietary regimes, orthopaedic surgery). We have devloped a software called AnatomyArchive, which facilitates fast and less-datapower consuming segmentation for radiomics and AI training of huge datasets of Computed Tomography (CT) images. Currently a technique to use advanced geometry based techniques to segment parts of the organs (such as regions of the hip) without the need of using machine learning.

Professor Torkel Brismar
Head of Division

AnatomyArchive:
A: Automatic standardized volume selection (first lumbar vertebra to lower pubic bone). Automatic detection of hip replacement.
B: Automatic exclusion of this case due to incomplete image coverage (magenta dotted line).
C: Segmentation of muscle (red) and automatic exclusion of arms D: 3D rendering of segmented structures.



A flowchart describing how to combine radiomic features, 3D features and 2D features into a single model in order to predict future hipfractuures from clinical abdominal CT scans.

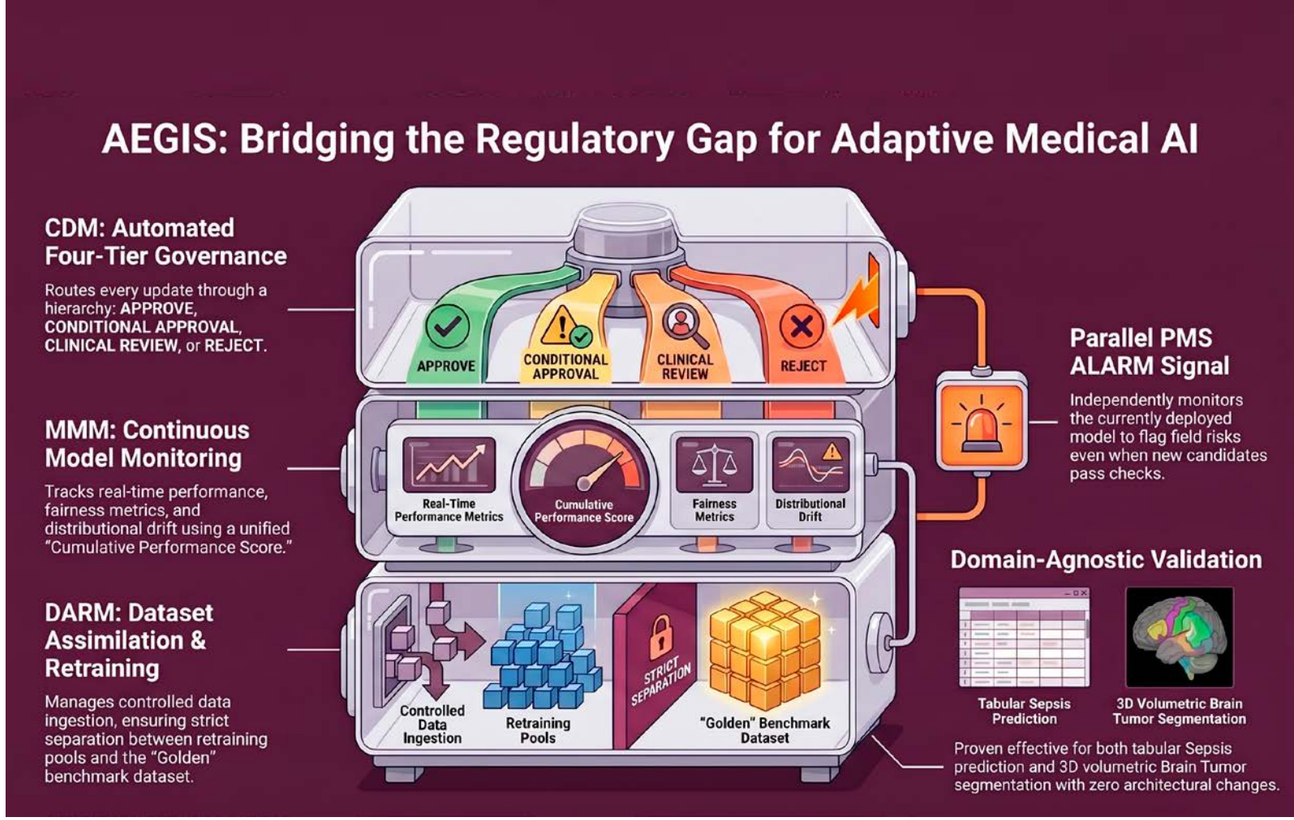


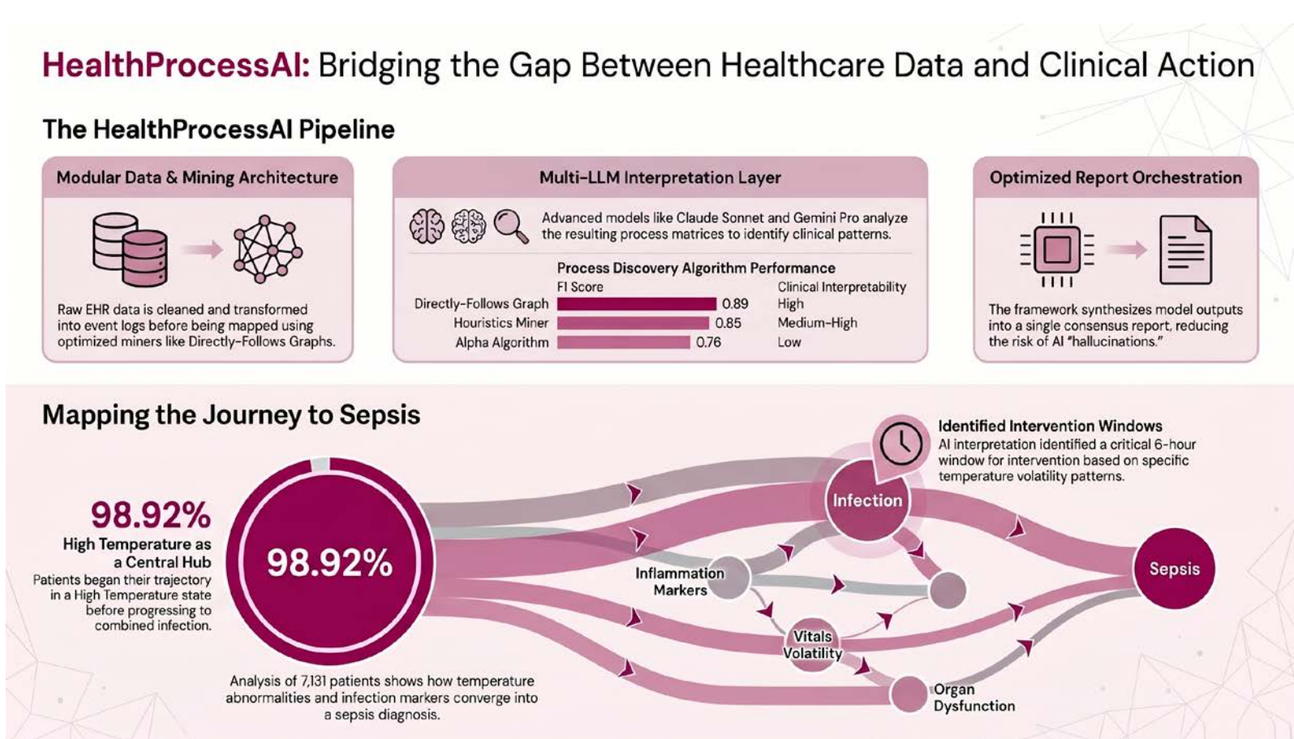
Medical Technology and Digital Health Research Group

The group unites clinicians, engineers and data scientists to develop and evaluate digital solutions for patient-centered, value-based healthcare, spanning medical device development, clinical decision support, real-world data analysis and AI applications. As a translational setting, it bridges innovation and clinical practice, generating evidence for adoption, scalability and sustainability while addressing interoperability, compliance, governance and ethics. A dedicated line of work supports implementation of the Medical Device Regulation (MDR) and the AI Act, covering clinical evaluation, risk management and post-market surveillance. Research applies real-world data and advanced analytics (process mining, AI, digital monitoring) to optimize care pathways and support precision medicine, integrating clinical outcomes, patient-reported measures and resource use. Collaboration and education are central: partnerships with Karolinska University Hospital, KTH Royal Institute of Technology, industry, authorities and patient groups enable co-creation, and training equips students, clinicians and researchers in digital health, regulatory science, AI and data management.

Senior Lecturer Fernando Seoane
Head of Group

Senior Research Infrastructure Specialist Farhad Abtahi
Head of Group





Division of Radiology
Doctoral theses and Licentiate theses (*) 2016–16 June 2026

Title	Author name	Publication year
Towards heart rate variability tools in p-health **	Abtahi, Farhad	2016
Cerebral microbleeds and cognitive impairment	Shams, Sara	2016
Drug and disease effects on the human brain studied by functional MRI	Engström Nordin, Love	2016
Radiomics in cancer prognosis: applications and limitations of quantitative texture analysis	Zhang, Yi-Hua	2018
Utility of hybrid SPECT/CT in sentinel lymph node mapping, and [18]F FDG-PET/CT for treatment response evaluation in cancer patients	Gabrielson, Stefan	2019
Diabetic foot care in Sweden *	Wennberg, Linda	2019
Transarterial chemoembolization in primary liver and kidney malignancies	Karalli, Amar	2019
PET/CT with 18F-FDG and 68Ga-DOTATOC in pulmonary carcinoid imaging *	Uhlén, Natalja	2019
Radiation dose-, contrast media- and image quality optimization in computed tomography	Thor, Daniel	2019
Optimizing computed tomography: quality assurance, radiation dose and contrast media	Nowik, Patrik	2020
Hands-on osteoporosis screening with digital x-ray radiogrammetry	Wilczek, Michael	2020
Differentiation of renal oncocytoma from renal cell carcinoma by means of ^{99}Tc-Sestamibi SPECT/CT	Tzortzakakis, Antonios	2021
Leukocyte scintigraphy, SPECT/CT and PET/CT in prosthetic joint infection	Teiler, Johan	2021
Perfusion computed tomography of the liver	Brehmer, Katharina	2022
Quantitative evaluation of liver function using gadoxetic acid-enhanced MRI	Wang, Qiang	2022
Pancreatic cancer: prevention through improved diagnostics in individuals at risk	Pozzi Mucelli, Raffaella	2022
Development of new blood banking strategies for processing and storage of red blood cell components	Larsson, Linda	2022
Contrast-enhanced ultrasound in children	Torres Urzua, Alvaro	2023
New developments in computed tomography: low dose techniques, image reconstruction, and spectral imaging	Alagic, Zlatan	2024
Bridging process mining and clinical epidemiology: a framework for discovering disease trajectories in real-world data **	Chen, Kaile	2025
Advanced Imaging of Primary Prostate Cancer	Olof Jonmarker	2026
FAPI PET Imaging in Pancreatic Cancer	Pawel Rasinski	2026
Translating Routine CT into Clinical Metrics in Kidney Transplantation: Hernia, Myosteatosis and GFR	Kristoffer Huitfeldt Sola	2026

* Licentiate thesis ** Published in cooperation with KTH Royal Institute of Technology

Division of Renal Medicine

The Division of Renal Medicine combines experimental and clinical research in a translational environment, integrated with healthcare and international collaborations.

History and Leadership
The division was established in 1980 and became part of the Department of Clinical Science in 1993. The first professor and head of the division was Jonas Bergström, succeeded by Anders Alvestrand in 1995, Peter Stenvinkel in 2009 and Marie Evans in 2027. The division has developed into a strong academic environment with high scientific productivity and significant international impact.

Translational Research and Collaborations
Research at the division ranges from experimental studies to patient-oriented clinical research and is driven by clinically relevant questions. Activities are conducted in close collaboration with the Department of Nephrology at Karolinska University Hospital in Huddinge, the Renal Research center at Novum and numerous national and international partners. Clinical studies are coordinated through a dedicated research unit at the nephrology department, where academic studies and high-impact industry-sponsored trials are managed. Statistical expertise within the group ensures high-quality data management.

Research Areas
The research focuses on key questions in nephrology. Major areas include:

- Vascular aging and vascular calcification
- Development, progression and treatment of chronic kidney disease
- Experimental studies based on kidney biopsies
- The interplay between malnutrition, inflammation and dialysis treatment
- Epidemiology and risk factors for kidney disease
- Endothelial dysfunction and uremic toxicity, including effects on the blood–brain barrier
- (Epi)genetics, bone disease and inflammatory kidney diseases

In addition, innovative research is conducted in biomimetics – drawing inspiration from nature's solutions – as well as the concept of "Food as Medicine" and the importance of sex and gender perspectives in chronic kidney disease.

Education and Supervision
The division contributes to teaching in the medical program and supervises master's students, doctoral students, post-doctoral researchers and international scientists, including Early Stage Researchers within EU projects. It is also responsible for Karolinska Institutet's doctoral program Developmental Biology and Regenerative Medicine (DevReg) and helps train the next generation of research leaders.

Research Environment and Infrastructure
Research activity is high, with approximately 60–70 scientific publications per year and around 10 doctoral students. The division operates an experimental laboratory at NEO, KI Campus Flemingsberg – a high-tech environment where education, research, healthcare and industry converge.

Renal Research at Novum
– An International Research Platform"
Since 1995, research within the division has been conducted with grant support from Baxter Healthcare and from 2025 Vantive. The focus is on chronic kidney failure and dialysis treatment, particularly peritoneal dialysis. The aim is to increase knowledge of peritoneal dialysis solutions and structural and functional changes of peritoneal membrane, factors influencing treatment outcomes and survival – such as cardiovascular complications, inflammation and malnutrition – and to develop improved strategies for diagnosis, treatment and prevention.

Professor Peter Stenvinkel
Head of Division

Division of Renal Medicine
Doctoral theses 2016–16 June 2026

Title	Author name	Publication year
Markers of inflammation and cardiovascular disease in dialysis patients: variability and prognostic value	Snaedal, Sunna	2016
Dialysis initiation and clinical outcomes in chronic kidney disease: role of education and biomarkers	Machowska, Anna	2016
Peptide and non-peptide biomarkers of mortality in patients with advanced chronic kidney disease	Sun, Jia	2016
Studies of drug disposition in hemodialysis patients: impact of genetics, inflammation and vitamin D	Molanaei, Hadi	2016
Innate immunity and cardiac structure in chronic kidney disease	Wallquist, Carin	2016
Chronic kidney disease of unknown etiology in Central America and Sri Lanka: renal morphology and clinical characteristics	Wijkström, Julia	2017
Growth hormones in chronic kidney disease	Nilsson, Erik	2018
The cholinergic anti-inflammatory pathway and heart rate variability with special reference to dialysis and renal denervation	Hilderman, Marie	2019
Consequences of kidney dysfunction in the community: health care-based epidemiological studies from the Stockholm creatinine measurements (scream) project	Runesson, Björn	2021
Chronic kidney disease: a clinical model of premature vascular aging **	Dai, Lu	2021
Nutritional status, body composition and diet in older adults with chronic kidney disease	Windahl, Karin	2022
Renal function decline and optimized planning for kidney replacement therapy	Hahn Lundström, Ulrika	2022
Inflammatory biomarkers in ANCA-associated vasculitis	Jónasdóttir, Ásta Dögg	2022
Chronic kidney disease and early vascular ageing: pinpointing culprits of injury and targets for intervention	Hobson, Sam	2023
Microcirculation in chronic kidney disease: from injury targets to potential therapeutics	Arefin, Samsul	2023
Pathogenesis of IgA nephropathy and diabetic kidney disease : linking molecular profile to morphological and clinical picture	Levin, Anna	2024

** Published in cooperation with Maastricht University

Bear Research for the Future of Kidney Medicine
Professor Peter Stenvinkel and radiologist Professor Torkel Brismar are participating in the Scandinavian Brown Bear Research Project, where the physiology of brown bears during winter hibernation is studied using advanced medical imaging techniques. The aim is to understand how bears protect their kidneys, muscles and metabolism during prolonged periods of inactivity – knowledge that may contribute to the development of new treatments for patients with chronic kidney disease.

Division of Speech and Language Pathology

The Division of Speech and Language Pathology integrates education, research and doctoral training in speech and language pathology, with a strong connection to clinical practice and collaboration across disciplines.

Education and Research in an Interprofessional Environment
The division holds the overall responsibility for the Speech and Language Pathology programme and provides independent courses at both undergraduate and advanced levels. Karolinska Institutet launched the Speech and Language Pathology (SLP) programme in 1964, as Sweden's first SLP education programme.

The programme is a four-year full-time programme (240 credits), with the final year at advanced level, leading to a professional degree in speech-language pathology and eligibility to apply for Swedish professional licensure.

The Speech and Language Pathology programme maintains exchange partnerships with several universities across the world. The programme is also a partner in the Speech-Language Pathology International Network (SLP IN),

Clinically Anchored Research Across the Lifespan
The division's research focuses on communication across the entire lifespan, covering topics ranging from early speech development (e.g., in children with cleft lip and/or palate) to writing and reading skills in adolescents (e.g., in relation to developmental language disorder (DLD) or ADHD), to speech and language in acquired brain disorders, as well as communication support in dementia. A central research area is voice disorders, including research on transgender voices, for example, studies of acoustic outcomes and how these relate to listener perceptions in gender-affirming voice training for trans women, as well as the assessment and treatment of severe voice disorders.

A further focus concerns eating and swallowing disorders (dysphagia), highlighting the shared physiological basis of speaking and swallowing.

Translational Approach and Strong Collaborations
Research and doctoral training are carried out in close collaboration with clinical activity at Karolinska University Hospital, and with academic partners such as Stockholm University and KTH Royal Institute of Technology. Nationally, the division collaborates with corresponding environments at universities in Lund, Gothenburg, Linköping, Uppsala and Umeå through annual education meetings, networks and research collaborations, and through the interactive educational resource PUMA. The division is also part of several international research networks.

Professor Christina Samuelsson
Head of Division

Foto: Liza Simonsson

Division of Speech and Language Pathology
Doctoral theses 2016–16 June 2026

Title	Author name	Publication year
Speech outcome in children born with cleft lip and palate treated with one-stage palate repair: aspects of function and environment	Nyberg, Jill	2016
The female voice in vocally demanding professions: field studies using portable voice accumulators	Szabo Portela, Annika	2017
Medical decision-making in Alzheimer's disease: a linguistic approach	Stormoen, Sara	2018
Medical decision-making capacity among geriatric patients with and without dementia: communication-based approaches for assessment and facilitation	Thalén, Liv	2019
Voice disorders and treatment effects in Parkinson's disease studied with a portable voice accumulator	Körner Gustafsson, Joakim	2020
Exploring childhood apraxia of speech: speech and language profiles in 5-year-olds with suspected apraxia of speech or cleft palate	Malmenholt, Ann	2020
Swedish children with moderate hearing loss: on the importance of monitoring auditory and early speech development the first three years	Persson, Anna	2020
Orofacial function in children with speech sound disorders	Mogren, Åsa	2021
Delayed babbling at 10 months: observation, detection and a two-year follow-up	Lieberman Rubin, Marion	2021
Diagnosis and recovery patterns in patients with apraxia of speech after stroke	Hybbinette, Helena	2022
Assessment and differential diagnosis in childhood apraxia of speech	Rex, Susanne	2022
Babbling, speech and language in children with neurological disabilities: development, validity of measures and effect of intervention	Nyman, Anna	2022
Stuttering in young females and males	Samson, Ineke	2022
Speech, communication, and neuroimaging in Parkinson's disease: characterisation and intervention outcomes	Steurer, Hanna	2025

Division of Surgery and Oncology

The Division of Surgery and Oncology conducts an extensive research programme within a multidisciplinary and multiprofessional academic environment.

The faculty comprises four professors together with clinical researchers, postdoctoral fellows and doctoral students working in five research groups. Research and educational activities are carried out in close collaboration with Karolinska University Hospital, largely within the framework of the Karolinska Comprehensive Cancer Center, fostering strong integration of clinical care, translational research and academic training in surgery and oncology.

The division maintains a strong international research profile and collaborates extensively with leading academic centers and clinical research networks across Europe, North America and Asia. These collaborations include participation and leadership in multinational clinical trials, international research consortia and collaborative translational projects.

Research activities are supported by two laboratories focusing on basic and translational research in upper abdominal cancers, integrating molecular and cellular biology, immunology and advanced omics technologies with clinically driven research questions. In addition to laboratory-based research, the division leads and participates in investigator-initiated academic clinical trials and conducts extensive translational and clinical epidemiological studies, often in collaboration with national quality registries and international partners.

Teaching takes place at multiple levels within the medical curriculum. The largest commitment is the seventh semester course in Clinical Surgery, a 20-week course including clinical placements in acute surgery and elective upper gastrointestinal and hepato-pancreato-biliary cancer surgery. Teaching is delivered through clinical training, seminars, teaching rounds and lectures, increasingly incorporating team-based learning (TBL). The course is offered every other semester in English as an international course. The division also serves as the administrative home for the medical curriculum's Professional Development Program.

Professor Magnus Nilsson
Head of Division

Marco Gerling Lab

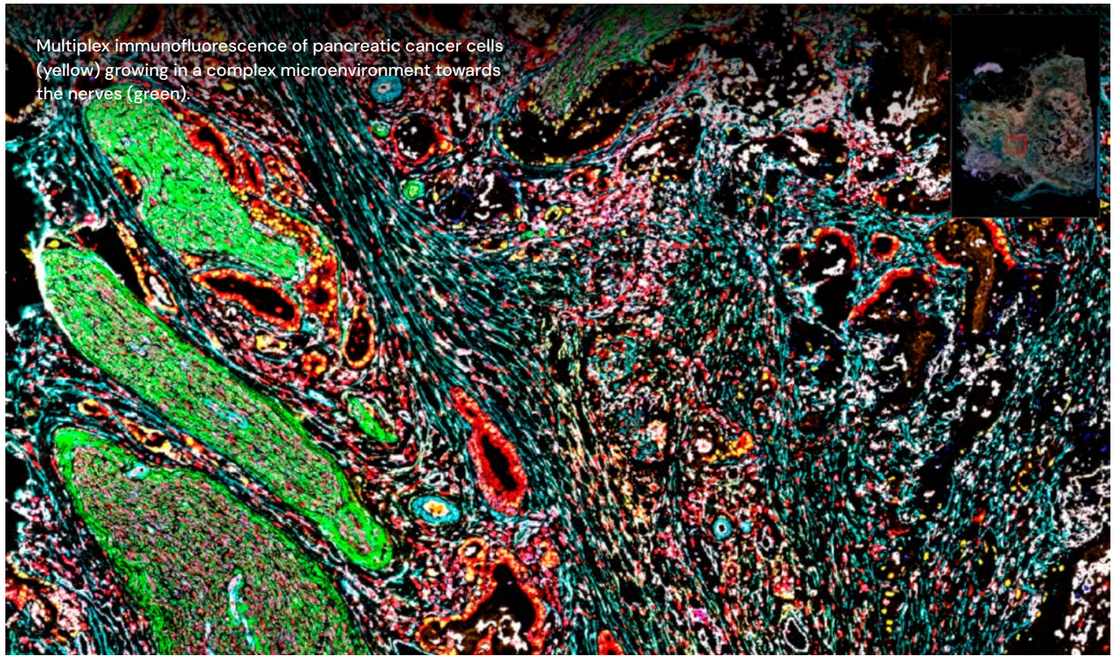
The Cancer Cell Invasion Lab studies how cancer cells interact with and invade normal tissues, particularly in the liver and pancreas.

A central focus is the dynamic interface between tumor cells and surrounding epithelial cells, where aggressive tumors replace healthy cells and reshape the local environment to support continued growth.

One of our major projects investigates how cancer cells induce nearby healthy cells to adopt a regenerative, progenitor-like state. These transformed cells promote tumor expansion and may contribute to treatment resistance. We have identified key signaling pathways driving this process and are exploring whether modulating these signals can limit tumor invasion by altering regeneration in surrounding tissue.

In translational projects, we aim to bring our findings closer to patients. We assess whether tumor-induced host tissue damage can serve as a real-time marker of active invasion to guide therapy. In collaboration with the Theranostics Trials Center at Karolinska, we study whether PET imaging can detect features of tumor-induced stroma, potentially identifying tumors with impaired drug delivery and enabling more effective treatment strategies.

Principal Researcher Marco Gerling
Head of Lab



Multiplex immunofluorescence of pancreatic cancer cells (yellow) growing in a complex microenvironment towards the nerves (green).

Rainer Heuchel Lab

PaCaRes – Pancreas Cancer Research Lab

The focus of our lab is on diseases of the exocrine pancreas. In previous years we investigated the role of Smad7/TGFbeta signaling during chronic pancreatitis in genetically engineered mouse models while our present focus is on pancreatic ductal adenocarcinoma (PDAC) in a translational collaboration with Matthias Löhr (KI/KH). PDAC is an aggressive and highly lethal cancer, characterized by a poor prognosis and a low five-year survival rate, often less than 11%. Most patients (80%) are diagnosed at advanced/metastatic stages, making successful resection challenging. In addition, PDAC has an exceptionally desmoplastic stroma resulting in resistance to any type of therapy. Our lab is using 3D spheroid culture consisting of pancreatic cancer and stellate (CAFs) cells to better mimic the in vivo situation and to identify treatment vulnerabilities. Beate Gündel, a former PhD student has performed a high through-put drug screen, identifying a handful of very promising hits. These are now followed up by Leon Heffinger another PhD student, shared with the lab of Dhifaf Sarhan with whom we also investigate spheroids including immune cells on top of cancer cells and CAFs. We also have collaborations with Scilife Lab (Aman Russom) and the Royal Institute of Technology (Fredrik Laurell) to develop a lab on chip for PDAC as well as new optical fiber- and laser-based diagnostic and treatment methods.

Associate Professor Rainer Heuchel
Head of Lab

Division of Surgery and Oncology
Doctoral theses 2016–16 June 2026

Title	Author name	Publication year
Aspects of neoadjuvant therapy in the curative treatment of cancer in the esophagus or gastroesophageal junction	Klevebro, Fredrik	2016
The evaluation, preoperative and operative aspects of abdominal wall reconstruction for giant ventral hernia	Clay, Leonard	2016
Liver regeneration and function following portal vein occlusion and hepatectomy	Sparrelid, Ernesto	2017
Hemorrhagic and thromboembolic complications following cholecystectomy	Strömberg, Jonas	2017
Aspects on the role of prophylactic procedures to influence post-ERCP complication rates	Olsson, Greger	2017
Aspects on interventions in complicated gallstone disease	Noel, Rozh	2017
Antibiotic prophylaxis and infectious complications in surgery for acute cholecystitis	Jaafar, Gona	2018
Outcome after liver resection: epidemiological and clinical studies with special focus on the role of post-hepatectomy liver failure	Gilg, Stefan	2018
Review and prediction of trauma mortality	Ghorbani, Poya	2018
Oral mucosa keratinocytes and their exosomes for epithelial tissue regeneration	Sjöqvist, Sebastian	2019
The reactive stroma in pancreatic diseases	Norberg, Jessica	2019
Health related quality of life and swallowing problems in oesophageal cancer	Sunde, Berit	2019
Borderline and locally advanced pancreatic cancer: redefining the biological and technical profile of the disease	Rangelova, Elena	2019
Chronic pancreatitis fibrogenesis: the role of TGFB pathway inhibitor Smad7 in the fibrosis development	Li, Xuan	2019
The papilla of Vater: issues relevant to transpapillary cannulation and clinical management	Haraldsson, Erik	2019
Hepatic ischemia-reperfusion injury	D'Souza, Melroy Alistair	2020
Is it all about the money? The effects of low and high cost simulator training scenarios in surgical training	Oussi, Ninos	2020
Outcome of gastric cancer surgery in Sweden	Kung, Chih-Han	2020
Aspects on advanced procedures during endoscopic retrograde cholangiopancreatography (ERCP) for complex hepatobiliary disorders **	Lübbe, Jeanne Adéle	2021
Nutritional status and dysphagia in patients with oesophageal cancer: the impact of oncological and surgical treatment	Ericson, Jessica	2021
New technologies for the further advancement of ERCP	Reuterwall Hansson, Marcus	2022
Surgical reconstruction of functional and anatomical defects in the diaphragmatic hiatus	Analatos, Apostolos	2022
Immunological aspects on prognosis in resectable cholangiocellular cancer	Jansson, Hannes	2022
Sex hormones in gastric mucosal physiology and the development of oesophageal, gastric and colorectal adenocarcinoma	Shore, Richard	2022
Investigation of tumour/stroma crosstalk in pancreatic cancer by an advanced 3D co-culture model	Liu, Xinyuan	2022
Invasive intraductal papillary mucinous neoplasm and pancreatic ductal adenocarcinoma: a comparison in clinicopathology and long-term outcome	Holmberg, Marcus	2022
Diagnostic and predictive factors in pancreatic cancer: clinical and translational studies	Kordes, Maximilian	2022
Improvement of the diagnosis and management of cystic tumors of the pancreas	Ateeb, Zeeshan	2022
Mangement of acute cholecystitis: surgery, drainage and gallbladder aspiration	Popowicz, Agnieszka	2023
Multimodal treatment of gastric cancer: assessment of tumor regression and the role of minimally invasive surgery	Tsekrekos, Andrianos	2023
Treatment of cholelithiasis and acute cholecystitis: surgical safety in gallstone surgery	Blohm, My	2023
Innovations in pancreatology	Halimi, Asif	2024
Timing of surgery after neoadjuvant chemoradiotherapy in the treatment of esophageal cancer	Nilsson, Klara	2024
Aspects on hereditary gastric cancer	Winnberg, Johanna Samola	2025
Nutrition and health-related quality of life after multimodality treatment of gastroesophageal cancer	Holmén, Anders	2025
In vitro modeling of tumor-stroma-crosstalk in pancreatic cancer leads to new insights into drug resistance and discovery	Gündel, Beate	2025
Advancing precision medicine in pancreatic cancer through bioinformatics-assisted genomic profiling and clinical stratification	Malgerud, Linnéa	2025
Inguinal hernia: optimizing surgical treatment	Westin, Linn	2025
Radiotherapy in the treatment of oesophageal cancer	Olafsdottir, Halla	2026

** Published in cooperation with Stellenbosch University

Division of Transplantation Surgery

The Division of Transplantation Surgery conducts research and education focused on solid organ transplantation, including kidney, liver, pancreas and islet cell transplantation.

The activities are performed in close collaboration with the Department of Transplantation Surgery at Karolinska University Hospital bringing together clinical excellence and groundbreaking research.

Our research is closely aligned to clinical practice and aims to improve patient outcomes. The clinical and translational projects include epidemiological research, clinical randomised controlled trials, experimental work and translational science spanning from the laboratory bench to clinic. The research team consists of professors, senior clinical researchers, basic scientists, clinical PhD students — including surgeons, nephrologists and other clinicians – as well as support staff such as laboratory personnel and research coordinators. We maintain strong collaborations with leading transplant research groups both nationally and internationally, and many of our researchers hold active roles in international professional organisations as speakers, educators, and committee members. The research at the division is primarily organised around four main themes:

- Organ donation and utilisation exploring novel strategies such as neonatal donation, thoraco-abdominal normothermic regional perfusion, uncontrolled donation after circulatory death and xenotransplantation.
- Organ perfusion and preservation technologies investigating strategies to expand the donor pool, improve organ quality, and reduce ischemia-reperfusion injury through normothermic machine perfusion and related technologies.
- Organ repair and engineering investigating strategies to repair organs such as mitochondrial transplantation, senolytics therapy, ATMPs and stem cell derived islet transplantation.
- Optimisation of long-term outcomes, with a focus on the mechanisms of allograft rejection, tolerance induction and optimisation of immunosuppressive therapy to balance efficacy with long-term side effects.
- Long-term outcomes and complications, studying graft survival, recurrence of primary disease, metabolic consequences of transplantation and the impact of chronic kidney disease progression.

The research is supported by access to well-characterised patient cohorts, national transplant registries and dedicated laboratory facilities enabling immunological phenotyping, molecular analyses and experimental transplant models spanning from mouse to larger animals and human organs. In addition to investigator-initiated studies, the division participates actively in academic and industry driven multicentre national and international trials.

Our teaching activities are integrated into the medical programme, covering the surgical and medical management of patients with end-stage organ failure and those undergoing transplantation. We also contribute to postgraduate and specialist training in transplant surgery and nephrology through seminars, masterclasses and workshops. The division is actively engaged in doctoral education, supervising clinical PhD students and contributing to courses in research methodology and ethics within the doctoral programme. We have an active outreach programme working closely with patient organisations to promote our activities via public lectures, debates, exhibitions and an active social media presence.

Professor Gabriel Oniscu
Head of Division

PhD students preparing samples for analysis in the transplantation lab.

Division of Transplantation Surgery
Doctoral theses 2016–16 June 2026

Title	Author name	Publication year
Microdialysis: potentials and limitations	von Platen, Anna	2020
The role of fibroblast growth factor 19 in human liver	Johansson, Heléne	2020
Characterization of human gamma delta T cells in allogeneic hematopoietic stem cell transplantation	Gaballa, Ahmed	2020
Experimental approaches and clinical opportunities in metabolic liver diseases	Karadagi, Ahmad	2020
Mapping the immune landscape in solid tumors: implications for immunotherapy	Foord, Emelie	2021
Targeting innate and adaptive immune responses to achieve long-term allograft acceptance following transplantation	Yao, Ming Han	2022
Biological ageing and kidney transplantation	Erlandsson, Helen	2022
Strategies for expanding organ availability and improving transplant outcomes	Bluhme, Emil	2024
Targeting ischemia-reperfusion injury in kidney transplantation	Nordström, Johan	2024

Team preparing a liver on nomorthermic machine perfusion prior to clinical transplantation.

Division of Urology

The Division of Urology is strongly linked to the clinical urological activities at Karolinska University Hospital in Huddinge.

Besides the head of the division the faculty consists of an assistant professor, an administrator, an affiliated associate professor and 10 doctoral students. All senior consultants at the clinical urological department are affiliated PhD's which ensure clinically relevant research within the urological sphere.

Research, clinical studies and educational activities are carried out in close collaboration with the Karolinska University Hospital within a multidisciplinary and multiprofessional academic environment. Since kidney cancer, testicular cancer and urothelial cancer of the upper urinary tract have been concentrated at Karolinska University Hospital at the Huddinge site, research is naturally focused on these areas as well as common benign urology which as well is concentrated to the Huddinge site. The research activities comprise basic as well as translational, epidemiological and clinical research in the mentioned areas. National as well as international collaboration is done to secure the relevance of the findings to most patients with urological conditions.

More specifically, the research is concentrated on urological malignant diseases, mainly renal, testicular, UTUC and superficial bladder cancer, as well as urological stone diseases, urological infectious diseases and urological benign urology and andrology with a focus on diseases of the internal and external genitals.

Teaching at the division has always been central to the activities of the division. In the last twenty years the basic course in surgery for medical students on the 7th semester, a twenty-week full semester long course, has been directed from the head of the division. The course integrates surgery, orthopedics, urology, anesthesiology, radiology, forensic medicine and acute and emergency conditions within the including specialties. Urological education includes clerkship-based rotations at the outpatient clinic, the ward, as well as the surgical department, and use lectures, digital seminars, IRL seminars, case-based discussions and TBL (Team Based Learning).

The main goal of our division is to produce the next generation of academic leadership within urology leading to better urological health for all.

Senior Lecturer Lars Henningsohn
Head of Division

Happy new PhD Anna Thor with her supervisors Anders Kjellman, Gabriella Cohn Cedermark and Olof Akre.

Division of Urology
Doctoral theses and Licentiate theses (*) 2016–16 June 2026

Title	Author name	Publication year
Prostate cancer: population-based screening and markers for long-term clinical outcome	Lundgren, Per-Olof	2021
Abdominal wall complications after urological surgery	Hermann, Maria	2021
Retroperitoneal lymph node dissection for non-seminomatous germ cell tumour	Gerdtsson, Axel	2022
Microrna and retroperitoneal lymph node dissection: advances in testicular cancer treatment	Thor, Anna	2025
Symtom vid behandling av urinblåsecancer med bcg-instillationer: omvårdnadsperspektiv *	Danielsson, Gun	2025

Research and education in urology.

The conferment ceremony of new PhDs takes place in the City Hall of Stockholm.

CLINTEC is the Department of Clinical Science Intervention and Technology at Karolinska Institutet.

We create new knowledge and improve clinical care through a unique blend of technology, translational science and bespoke interventions; in a strong creative cross-disciplinary environment together with the health care service.

There is a rapidly growing burden of illness as well as changes in population demographics and growing inequity in access to quality care.

CLINTEC delivers innovative, sustainable and transformative solutions to address global health care issues. We integrate education, research and clinical science to improve health.

We nurture future leaders to continue our vision and deliver the next level of innovative care in partnership with patients.

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