CMM News





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Grants for basic research from the Knut and Alice Wallenberg Foundation



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Myositis Clinic receives Heroes in Healthcare 2024 award

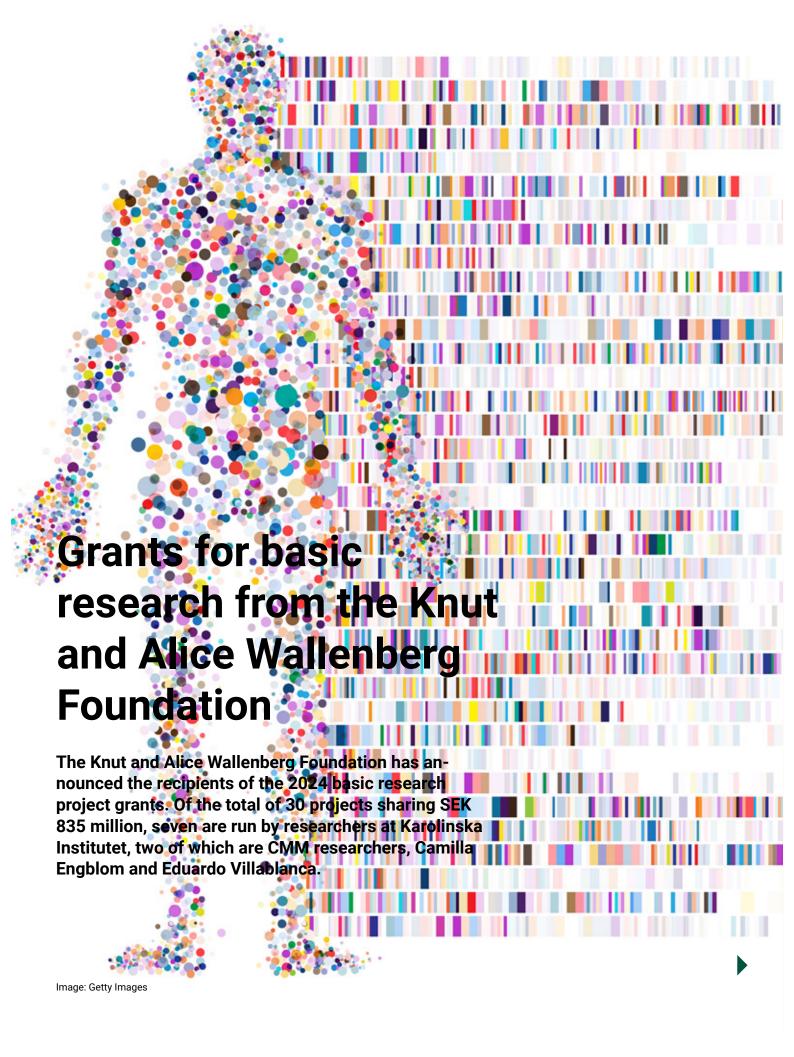


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CMM invites researchers to discover the core facilities











Camilla Engblom. Photo: Johannes Frandsén.

Eduardo Villablanca. Photo: Magnus Bergström, KAW.

A total of 30 projects, in medicine, natural sciences and technology, have been evaluated after an international peer review process to have such high scientific potential that they have the possibility of leading to future scientific breakthroughs.

Two of the grant recipients conduct their research at CMM, and both use spatial transcriptomics and proteomics in order to better understand their respective diseases of interest.

Camilla Engblom is a CMM Team Leader and assistant professor of immunology at the Department of Medicine, Solna. Her project will involve characterizing breast tumours focusing on their micro-environment and developing new methods of analysis.

Camilla's team hopes to understand in detail how cells interact in the tumour micro-environment with a particular focus on antibody-forming B cells.

One objective is to identify biomarkers able to predict which tumours will respond to immunotherapy using AI and 3D tumour models; they also hope to find new molecular therapeutic targets.

CMM Group Leader Eduardo Villablanca is docent of immunology at the Department of Medicine, Solna. He will be continuing his work using a variety of techniques to ascertain how the intestinal mucosa can be made to heal after an inflammatory bowel disease.

Part of his project involves creating an atlas of the interaction between different kinds of cell and between cells and bacteria in the gut microbiome. The researchers will also be using material from patients with inflammatory bowel disease in order to find candidate molecules that could lead to improved therapies.

"This funding enables us to perform high-impact, high-risk research that will allow us to visualize our tissue of interest with unprecedented resolution, pushing the boundaries of current scientific capabilities."

Eduardo Villablanca



New CMMers



Photo: Private

Natalie Rudolfova, is a medicinal and biological chemistry master's student from the University of Edinburgh who is working on a project with Opher Gileadi Team and Maurice Michel Team, determining alternative functions of DNA glycosylases.



Photo: Private

Jhonalex Buitrago joined Opher Gileadi's Team at CMM and SGC-Karolinska on July 1^{st.} He will work with Protein Science to investigate under-studied human genes as potential drug targets through generation of open-access knowledge and functional TEPs. Jhonalex will work on producing and characterizing novel human proteins as well as recombinant antibodies for EUbOPEN and the Dark Immunome projects. He joins us from Umeå University where he studied the molecular mechanisms behind the aggressiveness and metastasis of prostate cancer and kidney cancer cells. He has a strong scientific background in biochemistry and structural biology including X-ray crystallography, Cryo-EM and NMR spectroscopy, and will add valuable knowledge and expertise to our Protein Science team.



Photo: Private

Filippo Ferro is a master student at the University of Trieste currently doing his master thesis here at CMM under the supervision of André Ortlieb and Nicolas Ruffin. The main topic of his thesis is to better understand the effects of aCD20 treatment in mouse models of multiple sclerosis, focusing on lymph node architecture and GC reactions, trying to get better insights for new potential treatments for patients.



New CMMers



Photo: Private

Ramojus Balevicius is an Erasmus+ intern in Fredrik Piehl's research group under the supervision of Nicolas Ruffin. After finishing his Microbiology master's degree with Magna Cum Laude distinction at Vilnius University, he came to Karolinska Institutet as an internship student. His work centres on understanding the immune interactions that contribute to neuroinflammation in the pathology of multiple sclerosis (MS). He aims to shed light on the mechanisms underlying EBV infection and its relation to MS disease activity.



Photo: Private

Gavin Li started is doctoral studies under the supervision of Nicolas Ruffin in the group of Fredrik Piehl. He is interested in looking at B cells in MS to see if there is a specific subpopulation that are associated with both MS disease and EBV infection, and how these B cells are interacting with other components of the immune system to mediate disease. Beside is research, Gavin is a big foodie! During his free time, he likes to explore new places and trying out new cuisine!



Photo: Private

Alice Eddershaw is a new postdoc working with the CMM Teams of Maurice Michel and Opher Gileadi within the Protein Science team of the SGC-Karolinska. Alice recently completed her PhD at the University of Oxford, where she focused on better understanding the structure and function of key enzymes in the N-glycosylation pathway. At CMM she will work on producing and characterising novel human proteins for the Dark Immunome project, as well as to help set up the use of a baculo/insect cell expression for membrane proteins.

Welcome all new CMMers!



Changes in the CMM Steering Group

APPOINTMENTS



Anna Smed Sörensen. Photo: Rickard Kilström



Olle Kämpe. Photo: Rickard Kilström

We welcome professor Anna Smed Sörensen who joined the CMM Steering Group in October 2024 as a representative of the new members of CMM that moved in during June and September.

Professor Olle Kämpe has decided to step down from the CMM Steering Group due to time limitations. We thank Olle for the time during which he has served as a member of the CMM Steering Group and wish him the best of luck with his other commitments.

What is the CMM Steering Group?

The Steering Group is responsible for the overall research activities at CMM, ensuring their performance in a successful manner. It acts as a supportive organ to the Director, who makes the formal decisions.

The Steering Group ensures a continuous discussion between the researchers and staff at CMM, the management and the Board. All CMM personnel are welcome to contribute to and are important in discussions regarding policies, recruitment and research focus in a simultaneous top-down and bottoms-up process. Relevant issues are discussed during regular meetings and the Steering Group makes recommendations to the Director regarding actions.

The Steering Group currently consists of:

Michael Sundström, PhD, Director

Peder S. Olofsson, Professor, Specialist in Anesthesiology and Intensive Care Medicine

Maja Jagodic, Professor

Catharina Lavebratt, Associate Professor

Vivianne Malmström, Professor

Eduardo Villablanca, Associate Professor

Anna Smed Sörensen, Professor

Adjunct member:

Fredrik Piehl, Professor, Senior physician

New staff at the CMM Service Center

NEW STAFF



Kristina Edfeldt. Photo: Stefan Zimmerman Kristina Edfeldt has started to work part time at the CMM Service Center as a Foundation Project Coordinator.

Kristina has a long experience as project coordinator, most recently within the Structural Genomics Consortium, where she also continues working. She also has a history as a researcher at CMM.



New Professors from CMM

Installation ceremony for new professors, 3 October in Aula Medica

APPOINTMENTS



Liv Eidsmo



Anna Smed Sörensen



Ola Nilsson



Peder Olofsson Photos: Rickard Kilström

On October 3rd new professors at Karolinska Institutet were inaugurated in solemn forms during an installation in Aula Medica. Four of the professors are also Group Leaders at CMM.

Liv Eidsmo conducts research on the mechanisms driving chronic inflammatory skin disease. Ola Nilsson studies congenital growth and skeletal diseases. Anna Smed Sörensen investigates the function of the immune system in respiratory infections. Peder Olofsson seeks to understand how nerve signals regulate inflammation.

Congratulations to the newly inaugurated professors!



Myositis Clinic receives Heroes in Healthcare 2024 award

AWARDS

The Myositis Clinic, led by Professor and CMM Group Leader Ingrid Lundberg, is a world leader in research studies aimed at helping patients. The American Myositis Association is now recognizing their efforts with an award.

The American patient association The Myositis Association presents annual awards to dedicated researchers and clinicians. The Heroes in Healthcare Award is given to a healthcare facility that excels in the care they provide to people living with myositis and this year the association recognizes the Myositis Clinic at Karolinska University Hospital.

The award was presented at the association's annual conference in Baltimore on September 7 and was received by Professor Ingrid Lundberg.

Myositis is a chronic, autoimmune disease that affects about 100 people per year in Sweden. Myositis means that the body's immune system targets muscles, skin, lungs, joints and heart and can inflame these organs, often leading to permanent organ damage and low quality of life.

Ingrid Lundberg is Professor of Rheumatology at the Department of Medicine Solna, as well as Group Leader at CMM, and has a long history of research on myositis. In 1993, she founded the Myositis Clinic at Karolinska University Hospital. Today, the clinic consists of seven rheumatologists, a nurse, a physiotherapist, an occupational therapist and a social worker and is also a world leader in conducting research studies that can help patients with different stages of myositis.

"Our research has a focus on molecular mechanisms that lead to myositis and in particular how inflammation leads to muscle weakness. In collaboration with physiotherapist Helene Alexanderson we have demonstrated that exercise is not only safe to carry out when you have muscle inflammation but it also improves strength and quality of life. The results from our research were early implemented in the clinic and our now accepted as standard of care worldwide", says Ingrid Lundberg.



Ingrid Lundberg. Photo: Vasan Kandaswamy.





Martin Schalling awarded the Ingvar Prize 2024 for his research on lithium and bipolar disorder

Image: Getty Images

AWARDS

The Swedish Society of Medicine (SLS) awards Martin Schalling, CMM Group Leader and Professor of Medical Genetics at the Department of Molecular Medicine and Surgery, Karolinska Institutet, with the Ingvar Prize 2024.

Martin Schalling is awarded for pioneering studies on lithium and bipolar disorder. A study that is particularly highlighted is the first gene finding for lithium kinetics, published in Lancet Psychiatry 2022, where an algorithm that can contribute to faster introduction of lithium into the clinic is described. Martin Schalling is also rewarded for his work where lithium treatment is linked to telomere function, which opens up the use of lithium in new areas such as neuroprotection.

"It is a great honor to be awarded the Swedish Society of Medicine's Ingvar Prize. The study highlighted has resulted in a model to predict how much lithium a patient with bipolar disorder will need. Being able to predict the dose in individual patients is vital, as bipolar disorder is a condition that is linked to an increased risk of suicide, says CMMer Martin Schalling, Professor of Medical Genetics at the Department of Molecular Medicine and Surgery, Karolinska Institutet.

The prize will be awarded during the Swedish Society of Medicine's annual celebration on 22 October 2024. The prize winner is awarded SEK 35,000 and the SLS 200-year medal in bronze.



Martin Schalling. Photo: Ulf Sirborn.



The Alvarenga Prize for study showing new cause behind vascular complications in type 2 diabetes

Image: Pixabay

AWARDS

During the Swedish Society of Medicine's (SLS) Annual Ceremony on 22 October CMM researchers John Pernow and Aida Collado Sánchez were awarded with the Alvarenga Prize 2024. The laureates are rewarded for a research article on a study that shows a new cause behind vascular complications in type 2 diabetes and possible future treatment to prevent this.

The Alvarenga Prize rewards "unpublished articles submitted to the competition on topics pertaining to the field of medical research". Laureates John Pernow and Aida Collado Sánchez, professor and assistant professor respectively, at CMM and the Department of Medicine, Solna, Karolinska Institutet, were awarded for the article "Erythrocyte-Derived Extracellular Vesicles Induce Endothelial Dysfunction through Arginase 1 and Oxidative Stress in Patients with Type 2 Diabetes". The prize winners receive SEK 50,000.

In the current study, the research team shows that erythrocytes from patients with type 2 diabetes form and release small membrane vesicles, which are transported to the blood vessel wall. The membrane vesicles from the erythrocytes contain a variety of different signaling molecules and accumulate in the cells of the vessel wall.

"Our results show that one of the signalling molecules transported to the vessel wall causes the formation of harmful free oxygen radicals in the blood vessel wall and reduced ability of the blood vessel to dilate. We have also been able to show that treatments aimed at the uptake of membrane vesicles in the blood vessel wall and inhibition of the transported signaling molecule counteract the harmful effects of erythrocyte membrane vesicles on the blood vessels," says the research leader CMM Group Leader John Pernow, professor of cardiology at the Department of Medicine, Solna, and chief physician at Karolinska University Hospital. "These findings reveal a new cause behind vascular complications in diabetes and open up for possible future treatments to counteract vascular complications in type 2 diabetes.

The stydy is supported by funds from the Swedish Heart-Lung Foundation, the Swedish Research Council, Karolinska Institutet and Region Stockholm (ALF).



Aida Collado Sánchez. Photo: Eftychia Kontidou

John Pernow. Photo: Ulf Sirborn



Kyla McKay awarded Bjarne Ahlströms Minnesfonds pris 2024

AWARDS

CMMer Kyla McKay, researcher in MS epidemiology and affiliated with the Department of Clinical Neuroscience, has been awarded the Bjarne Ahlström Minnesfonds pris in "Clinical Neurology - especially inflammatory mechanisms affecting central or peripheral nervous system function".

The Foundation's citation for the award reads:

"Dr. McKay is in the midst of a successful research career and has contributed significantly to the knowledge of multiple sclerosis (MS) including associated symptoms and epidemiological basis. We would particularly like to recognize her contribution to the knowledge of psychiatric comorbidity in MS."

The prize from the Bjarne Ahlström Minnesfonds pris is SEK 1,050,000, which is distributed as an individual prize of SEK 100,000 and a research grant of SEK 950,000. The prize is awarded annually. Laureates are selected after nomination and peer review by decision of the Foundation's Board.

The award ceremony will take place on December 10, 2024.



Kyla McKay. Photo: Brian Wheeler.

About Bjarne Ahlströms Minnesfond

The Foundation was established in 2017 by the will of Bjarne Ahlström. During his lifetime, Bjarne Ahlström (1938-2017) worked very successfully as a coin dealer with his own coin shop. He was a very knowledgeable and recognized numismatist and was also the author of several works in the field, including the book Sveriges Mynt. At his death, Bjarne Ahlström left his entire estate to the foundation, whose purpose is to promote scientific research in the field of medicine, and to provide support for the preparation of teaching and training in these subjects.



The Blue Flame Award to Fredrik Wermeling for sharing of plasmids

AWARDS

Addgene is a non-profit organization that serves as a global plasmid repository, facilitating the sharing of molecular biology tools among researchers worldwide. Those scientists whose plasmid has been ordered 100 times or more are congratulated with a "Blue Flame Award". CMM Team Leader Fredrik Wermeling is one of them.

Plasmids are widely used in genetic research, including applications in CRISPR, cloning and gene expression studies. Since its founding in 2004, Addgene has grown to include more than 100,000 plasmids contributed by scientists from around the world. And demand from the scientific community is high - the organization receives around 20 000 requests annually.

This exchange of genetic tools promotes open science and accelerates the pace of research by making key reagents readily available.

"Addgene's work is of great importance to many researchers", says CMMer Fredrik Wermeling, who recently received the Blue Flame Award for a plasmid produced by his research group.



Fredrik Wermeling. Photo: Erik Holmgren.



The collaborative SynHealth project receives EU funding

Synergy for Healthy Longevity (SynHealth)

FUNDING AND GRANTS

Traditional healthcare systems focus on treating illness reactively. This puts a strain on resources and budgets. With rising costs and global funding crises, sustainability is at risk. The EU Horizon "SynHealth" project will address these challenges and transform Europe's approach to preventive healthcare by leveraging advanced research on glycan biomarkers. The SynHealth consortium includes the CMM Team of loannis Parodis, Genos (Croatia, SME, project coordinators and experts in glycomics research), GlycanAge (Croatia, SME, specialize in commercializing glycan biomarkers), F6S (Ireland, SME, global founder and startup network) and two academic collaborators University of Maribor (Slovenia) and University of Liège (Belgium). The project is founded for 3 years with a total budget of €1.2 M.

Why Glycan Biomarkers Matter

Glycans, complex sugar molecules attached to proteins, have emerged as powerful biomarkers that offer insights into an individual's genetic, epigenetic, and lifestyle factors. Unlike traditional biomarkers, glycans provide a more comprehensive picture of health, making them ideal for predicting and preventing complex diseases before they manifest. Over the past 15 years, our partners at Genos have been at the forefront of glycomics research, integrating these biomarkers into multiple large-scale epidemiological and clinical studies. SynHealth builds on this extensive research, aiming to bring these biomarkers into everyday healthcare.







Image: Flaticon by zero_wing



Ioannis Parodis. Photo: Private

Key Objectives

The SynHealth project is focused on three main objectives:

- Developing person-centered Al-based healthcare tools: we are creating a prototype of an Al-driven support tool to deliver personalized health recommendations based on glycan biomarkers.
- Translating Research into Real-World Applications: our project will prepare a clinical study for glycan biomarkers and grounds for future proposals ensuring that our research translates into practical technologies for personalized preventive medicine.
- Fostering Innovation and Collaboration: SynHealth brings together research institutions, including the University of Maribor, Karolinska Institutet, and University of Liège, alongside commercial partners like GlycanAge. Together, we are building a robust network to support innovation and knowledge transfer across Europe.

For more information about the SynHealth project please visit https://synhealth-project.eu/, and LinkedIn page https://www.linkedin.com/company/synhealth/



Leo Hanke receives ERC starting grant

FUNDING AND GRANTS

The European Research Council (ERC) has announced this year's recipients of Starting Grants for young scientists and scholars across Europe. Six project applications submitted by researchers from Karolinska Institutet have secured grants totalling 9.8 million Euro – an important recognition for KI. One of the grantees is CMM researcher Leo Hanke.

The European Research Council (ERC) announced on the 5th of September 2024 that it would allocate EUR 780 million in Starting Grants.

A total of 3,474 applications were evaluated by peer review panels composed of internationally recognised researchers. Of these, 14.2 per cent were selected for funding.

Leo Hanke, CMM Team Leader and assistant professor at the Department of Medicine, Solna, is one of the six principal investigators at Karolinska Institutet who received this highly competitive grant.

The granted project is titled "VaxVision: Structure and Function-based Design of Vaccine Antigens and Antiviral Immunotherapies" and described as follows:

This project aims to improve vaccines by leveraging the unused potential of viral glycoprotein presentation. Vaccines are critical in preventing viral diseases, and recent advances in how vaccines are made and delivered have made them more effective and widely available.

Viral glycoproteins, which help viruses enter host cells, are the main targets of the immune system and therefore the key component of viral vaccines. However, for many viruses there is a lack of fundamental biological insights in how to easily turn these glycoproteins into highly effective vaccine components.



Leo Hanke. Photo: Private

The project will provide an innovative workflow for systematically uncovering important details that can lead to improvements in vaccines, not just against viruses but potentially other pathogens as well.

Libraries of small specific inhibitors will be used, including camelid nanobodies and computationally de novo designed proteins to study the structure and function of highly pathogenic viruses. The goal is to use these insights to create better vaccine components.

The text is based on an article from Karolinska Institutet.

About ERC Starting Grants

ERC Starting Grants provide support for promising young researchers at the beginning of their independent research career. The programme is open to researchers of any nationality with 2-7 years of experience since completion of their PhD, a scientific track record showing great promise and an excellent research proposal.



Consolidator Grant from SSMF to Christopher Sundling

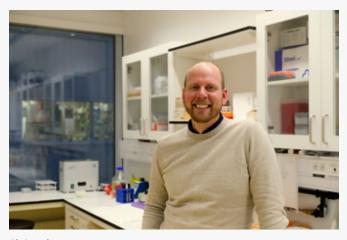
FUNDING AND GRANTS

SSMF (Swedish Society for Medical Research) is aimed at researchers in all medical fields and supports basic research as well as applied research. CMM Group Leader Christopher Sundling is one of the 21 researchers at Karolinska Institutet who have been awarded the SSMF Grants 2024.

Christopher Sundling studies inflammation and immune regulation during infection, particularily infection with tuberculosis (TB).

TB is the single infectious disease killing most individuals every year. This stems from as much as 25% of the global population being infected with the causative pathogen, Mycobacterium tuberculosis (Mtb). Most of those exposed to Mtb eliminate or control their infection. However, we don't know how this control works and why it sometimes fails.

The project that has been awarded with the 2024 SSMF Consolidator Grant is titled: "Immune responses associated with protection or disease in tuberculosis". "Using our own biobank established at Karolinska University Hospital together with samples collected in the EU consortium ERASE-TB, we will investigate biological



Christopher Sundling. Photo: Carolina Sousa Silva

pathways and mechanism associated with infection control or disease progression. Our goal is then to develop methods to detect these individuals that lose control of their infection at an early stage, as well as identify new targets and treatment strategies for continued control or elimination of the infection," Christopher Sundling explains.

"This grant allows us to investigate tuberculosis to an unprecedented level"

Christopher Sundling



Publications

CMMers IN BOLD

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Dissertation of Alexandra Cîrciumaru: From autoimmunity to inflamed joints: study of risk factors, mediators and cellular targets in rheumatoid arthritis

CMM EVENTS & OUTREACH





Top: Bence Réthi and Alexandra Circumaru. Bottom: The new PhD together with the opponent and the examination board. Photo: Private.

On May 24th Alexandra Cîrciumaru sucessfully defended her PhD thesis titled "From autoimmunity to inflamed joints: study of risk factors, mediators and cellular targets in rheumatoid arthritis".

Professor Carl Goodyear from the University of Glasgow served as opponent at the dissertation. The principal supervisor of Alexandra's thesis work was associate professor Bence Réthi (as well as professor Anca I. Catrina 2018-2021) at the Department of Medicine, Solna Division of Rheumatology. The co-supervisors were professor Lars Klareskog and Aase Hensvold MD, PhD, both at at the Department of Medicine, Solna Division of Rheumatology.

The members of the examination board were docent Susanna Brauner, MD, PhD, from Karolinska Institutet, Department of Clinical Neuroscience, docent Jonas Wetterö, PhD, Linköping University Department of Biomedical and Clinical Sciences, and docent Joannis Parodis, MD, PhD, Karolinska Institutet Department of Medicine, Solna Division of Rheumatology.

Congratulations Alexandra!



Visit from Guangdong Hospital of Chinese Medicine

EVENTS & OUTREACH



Researchers from the Guangdong Provincial Hospital of Chinese Medicine in front of CMM. Photo: Louisa Brieskorn.

At the end of the summer, CMM Group Leader Per-Johan Jakobsson, researcher at the Department of Medicine Solna, hosted a group of visitors from Guangdong Provincial Hospital of Chinese Medicine. This hospital, which is situated in the very south of China, is a partner in a research project run in collaboration with Karolinska Institutet called the Joint Research Base for Traditional Chinese Medicine (JRBCM).

The project is an 8-year project initiated in 2020, and the meeting in August was the 4th Annual Meeting. The program included one open day, where interesting talks from CMMers Camilla Svensson, Department of Physiology and Pharmacology, and Lars Klareskog, Department of Medicine Solna were mixed with presentations by scientists closely associated to JRBCM including Professor Ulf Göransson, Department of Pharmaceutical Biosciences at Uppsala University, and his research group. The second day was devoted to internal project discussions followed by social activities during the weekend. Such activities are important to bridge the geographical gap between groups within a research project, as well as to build strong friendships. It helps the productivity of any collaboration, and especially this one where communication is affected by language barriers.

More about the project

JRBCM is a very productive research project involving around 40 scientists at KI, Uppsala University and Guangdong Provincial Hospital of Chinese Medicine. Using bioassay guided compound isolation, the project has structurally defined over 100 pure compounds from a selection of 19 plants used in traditional Chinese medicine for the treatment or prevention of rheumatoid arthritis. These compounds are presently being tested for biological activity and when present, their mode of action is being investigated using e.g. proteomic analyses or enzymatic screens.

The main research aims of the JRBCM project are: to understand mechanisms of action of herbal based traditional Chinese medicine used to treat rheumatoid arthritis to develop novel drugs based on the active principles of these herbs to prevent rheumatoid arthritis.

Text: Louise Berg



CMM Seminar Series, Tuesday 19th of November at 15:00

Lars Fugger: "Ancient DNA reveals evolutionary origins of autoimmune disease"

CMM SEMINAR SERIES

Speaker: Lars Fugger, Professor of Neuroimmunology, Nuffield Department of Clinical Neurosciences, University of Oxford

Title of the talk: Ancient DNA reveals evolutionary origins of autoimmune disease

Date and time: Tuesday 19 November, 15:00

Venue: CMM Lecture Hall, Visionsgatan 18, floor 00, Karolinska University Hospital, Solna, L8:00.

After the talk there will be a networking reception with some drinks and light bites.

Due to the limited number of places, please sign up here or scan the QR-code:





CMM Core Facility Day, Monday 9th of December at 12:00

Discover the Core Facilities at CMM

CMM CORE FACILITY DAY

Program:

12:00 Lunch seminar (light lunch included) with the possibility of online participation

- Overview of CMM's core facility strategy
- Short presentations of main facilities

13:30 Tour of the core facilities (choose in the registration form which ones you would like to visit)

Registration deadline 22 November.

Please register <u>here</u> or scan the QR-code:



Core facilities that will be included in the tour:

- Flow Cytometry Core
- Functional Fluorescence Microscopy Imaging (fFMI)
 Core
- Genetic Analysis (KI Gene) Core
- Spatial Biology (KI Gene) Core
- · Cell Observatory (Single Cell) Core
- IncuCyte Live Cell Analysis Core
- Preparative Histo Core
- Transcriptomics & Proteomics Core Facility (information will be available within short)

Venue: CMM Lecture Hall, Visionsgatan 18, floor 00





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