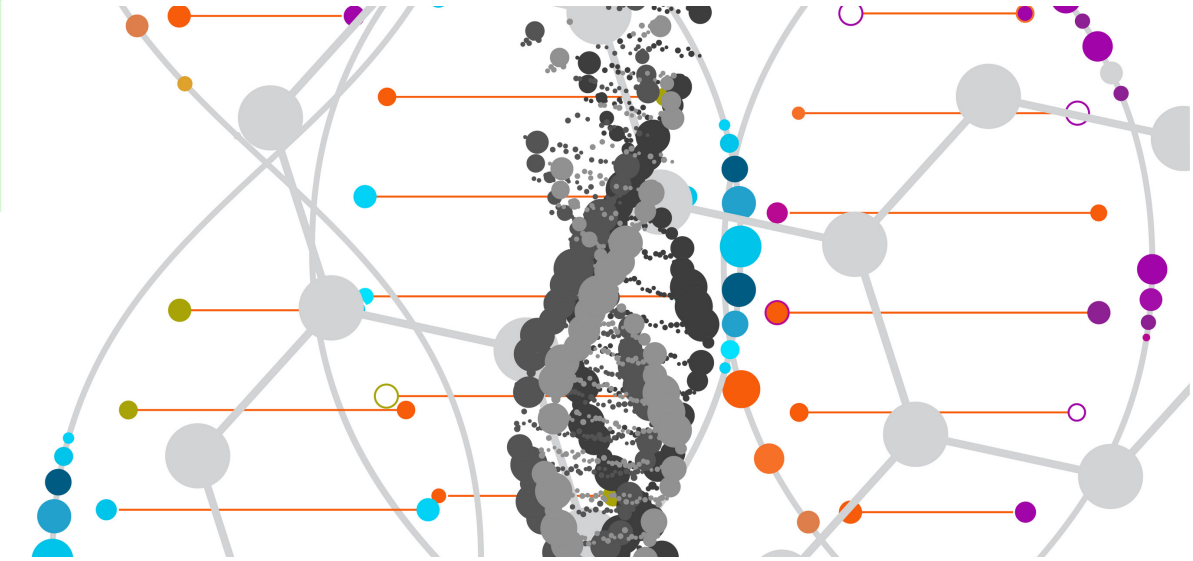
No. 3 / 2026
Center for Molecular Medicine

CMM News



Page 2-4

New Genetic Insights into Bicuspid Aortic Valve Development

Page 7-8

New CMM Team Leader: Gustavo Monasterio. Read about his research.

Page 14

CMM Postdoc Grant Winner Announcement

Download this newsletter here

Editor: Magdalena Lindén
Layout: Edna Fagerstedt

CMM

New Genetic Insights into Bicuspid Aortic Valve Development

PUBLICATION

Researchers from CMM and KTH uncover how rare genetic variants reshape chromatin architecture in patients with bicuspid aortic valves, who have undergone open-heart surgery for ascending aortic dilatation. The results offer new insight into early heart development and expanding the network of genes linked to this common condition.

PUBLICATION: "Rare regulatory mutations disrupt mesenchymal molecular programs driving endocardial cushion formation in bicuspid aortic valve", Artemy Zhigulev, Doreen Schwochow, Nikita Gryzunov, Andrey Buyan, Vladimir Nozdrin, Enikő Lázár, Raphaël Mauron, **Karin Lång**, Rapolas Spalinskas, Sailendra Pradhananga, Madeleine Petersson Sjögren, Anders Franco-Cereceda, Joakim Lundeberg, Ivan V. Kulakovskiy, **Per Eriksson, Hanna M Björck,** Pelin Sahlén, *Nature Communications*, online 18 april 2026, doi:10.1038/s41467-026-71758-5

Image: iStock.

Hanna Björck's CMM Group studies molecular and genetic mechanisms behind the development of ascending aortic disease, a silent yet potentially life-threatening condition in which the aortic wall rupture or dissects.

Some people are born with a bicuspid aortic valve (BAV), which means that the aortic valve is formed with only two cusps instead of three.

Ascending aortic disease and other complications occur more frequently and at a younger age in patients with BAV than it does in patients with normal tricuspid aortic valves (TAV). For that reason, more than half of the individuals born with BAV will undergo surgery at some point in their lives.

The underlying causes for BAV have long remained unclear. Early research showed that a very small number of cases are caused by changes in genes that contain the instructions for making proteins, the molecules that carry out most of the work in a cell.

Later on, using genome-wide association studies, some common variations in the non-protein coding parts of the DNA were associated with BAV. However, these associations do not explain the BAV frequency, which is 0.5-1.5 % in the general population.

Hanna Björck's group administers a unique patient cohort (>2,900 patients) and biobank of aortic biopsies, vascular cells, plasma/serum/blood and DNA that they have built over the years together with colleagues at the thoracic surgical clinic at the Karolinska University Hospital in Solna. Taking advantage of this resource Hanna Björck and postdoctoral researcher Artemy Zhigulev decided to go deeper into the genetic studies of BAV and use the targeted chromosome conformation capture (HiCap) method developed by Artemy's PhD supervisor at the Royal Institute of Technology (KTH), Pelin Sahlén. This time the researchers wanted to look for rare genetic variants in promotor or enhancer regions, i.e. variants that potentially disrupt binding of transcription factors and thus affect further signaling pathways. They hypothesized that rare mutations in these regulatory regions might disrupt heart development in subtle but important ways.

HiCap is a method for detecting spatial interactions of genomic features such as promoters and/or enhancers when the genome is folded in 3D. The method essentially consists in cross-linking interacting regions of DNA and cutting it and sequencing the pieces of DNA. To-

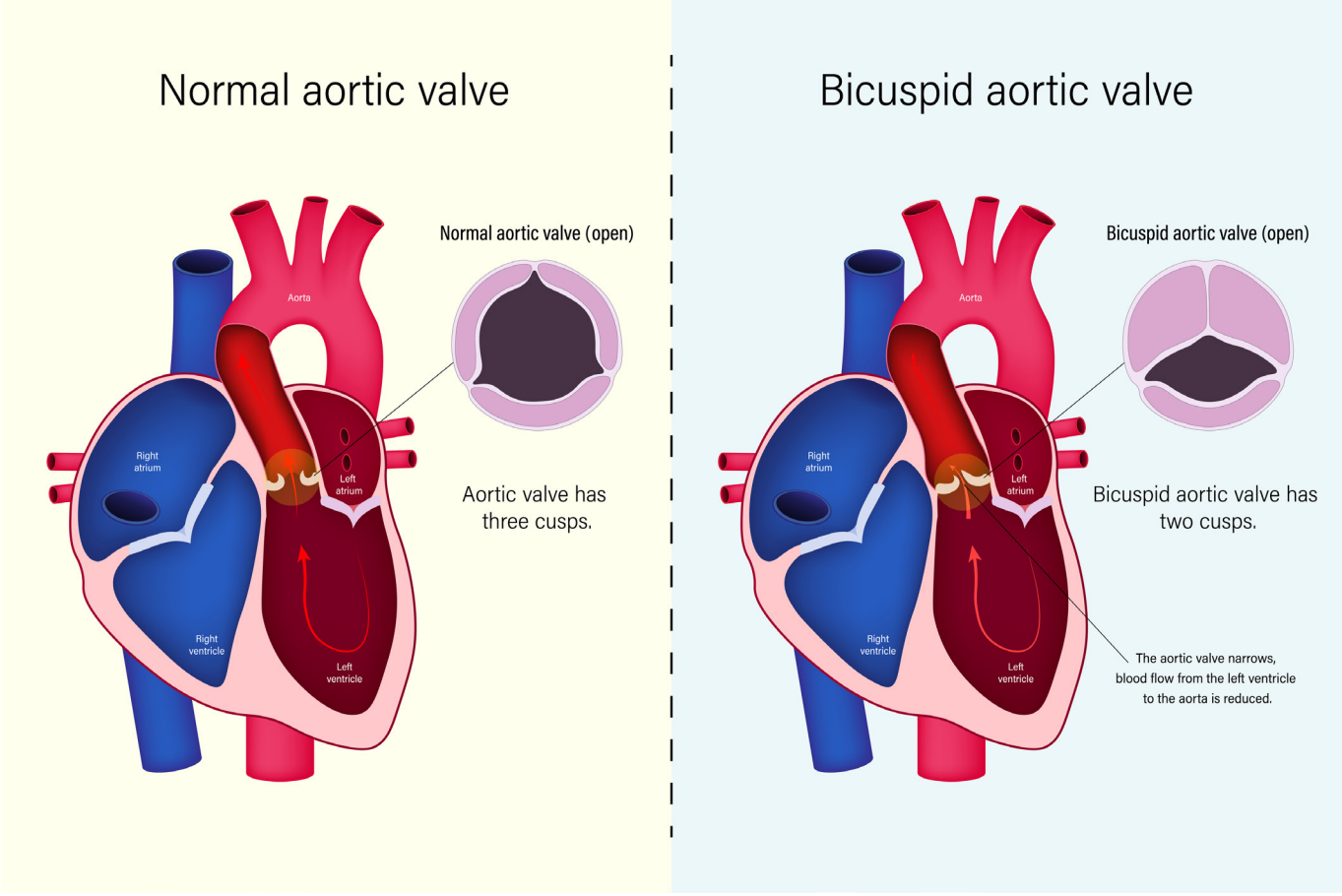


Image: iStock.

day HiCap is commercially available as a kit where you design a probe set for your purpose.

"One of the beauties of the HiCap method is that you can capture enhancers that regulate a particular gene and from there go upstream to analyze which transcription factors or cofactors that bind within that promotor and enhancer element. But it is crucial to apply it in the correct context, because different genes are differently regulated in different cells," says Artemy Zhigulev.

"Ascending aortic endothelial cells have the same embryonic origin as the cells that form the aortic valve. The hypothesis is that the distorted molecular interactions that gave rise to the malformed aortic valve, are also present in malfunctioning endothelium," Hanna Björck explains.

Based on this assumption, the researchers decided to study BAV by using aortic biopsies taken from 16 patients undergoing elective open-heart surgery for ascending aortic dilatation. Eight of the individuals had BAV and the other eight had normal, three leaflet valves.

By combining HiCap with whole-genome sequencing, the researchers could build a detailed map of how regulatory regions connect to genes involved in heart development—and to identify rare mutations embedded within those regions.

Hanna Björck.
Photo: Private

Artemy Zhigulev.
Photo: Viktoriia Burnukina (@samuburena)

It turns out that, in individuals with BAV, mutations were linked to substantial "rewiring" of chromatin architecture, affecting significantly more genes involved in early heart valve formation than in healthy individuals. Although each patient carried a unique set of mutations, these changes tended to converge on the same biological processes.

To understand the consequences of this rewiring, the researchers looked at how affected genes function during embryonic development. They integrated their findings with gene-expression data from developing human hearts. Developmental signals are not active anymore in the vascular cells, i.e. the embryonic milieu is lacking. However, the deficient interaction, caused by a rare or several rare genetic variants, is still there and can be detected.
Altogether, the researchers identified 198 candidate genes linked to the condition - largely expanding the known genetic network behind BAV.

"With this paper we showcase how to apply the method in a tissue and disease-specific context. The dataset that we have generated can now be used to further examine which genes regulate a gene of interest in this context," says Hanna Björck.

Are you interested in the methods or expertise used for this paper?

We are happy to collaborate!

For general applications of the HiCap methodology:
Pelin Sahlén, KTH,
pelinak@kth.se

For cardiovascular applications:
Hanna Björck CMM Group, hanna.bjorck@ki.se

New CMMers

Stella Wennborg is a medical doctor and aspiring pediatrician with a particular interest in neonatology and pediatric emergency medicine. She joined Eric Herlenius' research group at CMM in 2026 and will be working with the deepNEWS project until October. Within the project, she works with the validation of clinical data used in the development and evaluation of AI-based tools for neonatal care. Her role involves ensuring that clinical information is accurately represented and can be used to support research and future clinical applications in neonatology.

Qingyang Qiu is a master's student in Medical Engineering at KTH Royal Institute of Technology. She is interested in physiological signal processing and medical data analysis. She is currently participating in the Herlenius research group and contributes to the DeepNEWS project. Her work focuses on analysing neonatal physiological signals and developing machine-learning-based approaches to predict neonatal maturation, with the aim of supporting timely clinical intervention, risk prediction, and early identification of adverse health conditions.

Zhaoqing Wang is a visiting student (M.D. student from Shandong University, China) in Eduardo Villablanca's CMM Group. He is conducting a six month exchange research at CMM. His work focuses on single cell and spatial transcriptomics analysis and the development of related bioinformatic tools. To address analytical challenges, he has developed R/Python packages including SlimR (cell type annotation), CellJanus (host microbial deconvolution), and scPairs (synergistic gene networks). His long term goal is to use computational biology to decode mucosal immune heterogeneity and advance understanding of digestive diseases.

Priyanka Choudhury is a new postdoctoral fellow in Dr. Åsa Wheelock's group at CMM. She obtained her PhD in Biomedical Sciences from the Indian Institute of Technology Kharagpur, India. Her doctoral research focused on understanding the underlying pathophysiology of COPD-associated pulmonary hypertension using a multifaceted approach. At CMM, her research will focus on molecular phenotyping of endemic lung diseases using state-of-the-art omics methodologies and bioinformatics integration approaches.

New CMMers

Pernelle Pulh is a new postdoctoral researcher in Prof. Ning Xu Landén's group at CMM. She obtained her PhD in Neurosciences from Paris-East Créteil University (France), where she studied the pathogenesis of cutaneous neurofibromas in Neurofibromatosis type 1. She is now investigating human tympanic membrane regeneration and the mechanisms underlying chronic perforations, combining single-cell and spatial transcriptomics. She is interested in exploring the role of innervation in tympanic membrane wound healing.

Teodora Piskova is a new postdoc in Carolina Hagberg's CMM Group. Teodora obtained her PhD at RWTH Aachen, Germany, where she studied mechanobiological changes due to cell loss in the non-proliferating retinal epithelium and their impact on phagocytosis. Teodora's postdoc project will be focusing on cortex remodelling and lipid import in hypertrophic adipocytes.

Danique Berrevoet is a visiting PhD student from Ghent University, Belgium, currently joining Liv Eidsmo's group for a 7-month research stay. She works on inflammatory autoimmune skin diseases, with a special focus on vitiligo. In the group, she will focus on tissue-resident memory T cell differentiation to better understand its role in vitiligo pathogenesis. Besides science, she loves baking, spinning, and swimming.

Shengjie Peng is a new postdoc in Ning Xu Landén's CMM Group. He obtained a PhD in Biophysics from University of Science and Technology of China, China. His research focuses on human skin wound healing, with particular interest in the regulatory roles of lncRNA and miRNAs in both acute and chronic wound repair.

Gustavo Monasterio Team

NEW TEAM LEADER

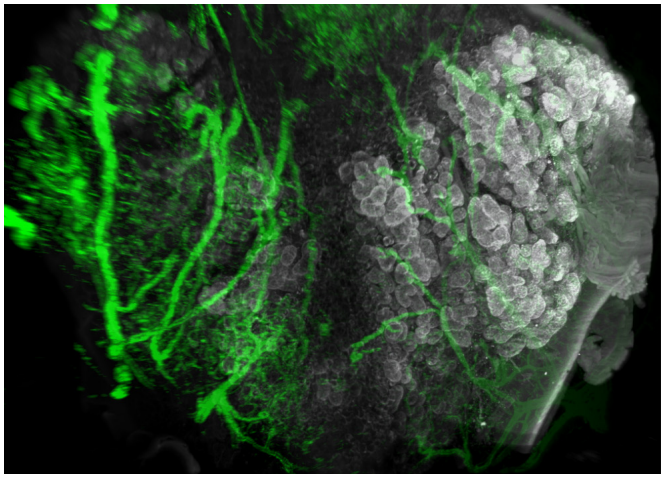
Gustavo is a clinician-scientist trained as a Doctor of Medicine in Dentistry at Universidad de Chile, with expertise in craniofacial physiology and surgery, and holds a PhD in oral immunology and microbiology from the same institution. He completed postdoctoral training in intestinal mucosal immunology in the Villablanca lab at the Department of Medicine, Solna (Karolinska Institutet). Bridging clinical and mechanistic research, Gustavo has helped pioneer the "oral–gut axis" as a field, co-founding the Oral-Gut Conferences, and works to position the salivary glands as organs with underexplored roles in systemic physiology. He has extensive experience supervising students at the BSc, MSc, and PhD levels, and has lectured at national and international courses. The lab is supported by a Swedish Research Council (VR) Starting Grant, with additional funding from the Ruth and Richard Julin Foundation, the Eva and Oscar Ahrens Foundation, the European Crohn's and Colitis Organisation, and the Osteology Foundation.

Four questions to the new team leader:

What is the focus of your research?

Salivary glands are highly conserved across mammals and have traditionally been regarded as accessory organs of the oral cavity, primarily providing lubrication. However, emerging evidence from our lab and others shows that these organs are far more complex, with roles in immunity, infectious disease, and systemic physiology. Notably, salivary glands express components of endocrine circuits such as the renin–angiotensin system and release bioactive factors with potential influence on inflammatory, vascular, and regenerative processes beyond the oral cavity. Yet these roles remain largely descriptive, and the underlying mechanisms have not been systematically dissected.

Our lab works at the interface between exocrine gland biology and aerodigestive barrier physiology, aiming to bring mechanistic depth to these observations. We investigate how salivary glands sense and respond to aerodigestive signals and coordinate adaptive and homeostatic responses in health and disease. Our overarching goal is to mechanistically define the role of salivary organs in systemic physiological circuits, and to leverage their minimally invasive accessibility from the oral cavity as a therapeutic entry point for a range of human diseases.



Representative image of Gustavo's research: 3D whole-mount light-sheet imaging of the neural and secretory networks of a mouse salivary gland. Photo: Gustavo Monasterio.

Gustavo Monasterio Team

NEW TEAM LEADER

What methods do you use?

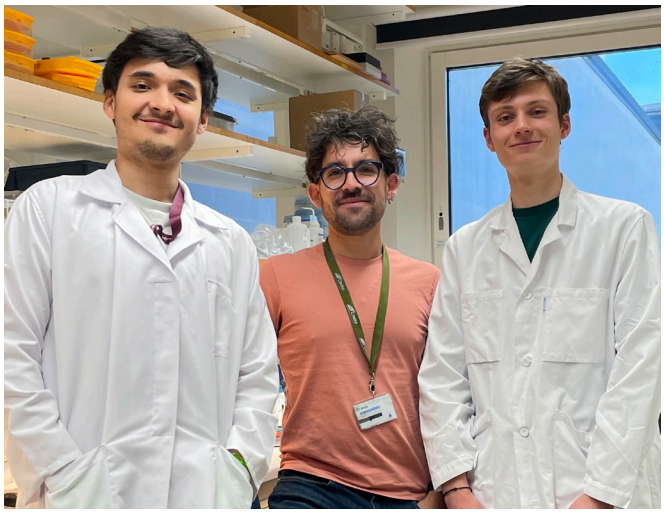
Our research will be primarily based on preclinical models of mucosal barrier perturbation, where we will combine surgical approaches with genetic tools, including transgenic lines and viral-mediated, organ-targeted gene modifications, to mechanistically dissect the non-canonical functions of salivary organs in both homeostatic and perturbed states. We will complement these in vivo studies with organoid and ex vivo platforms that allow compartment-specific interrogation of distinct salivary tissues. For translational relevance, we are collaborating with clinicians at Karolinska University Hospital to extend our findings to human salivary tissues and secretions.

Who is part of your team?

Our starting team currently includes Matteo Friederich, an MD/MSc intern from the University of Strasbourg. From autumn 2026, we will be joined by Sylvia Pinhate, MSc, and our first recruited PhD student.

Where in the building can you be found?

You'll find us on floor 3 of CMM, first office on the right (Gustavo) and first lab on the left. We're also frequent guests on the 5th floor, where coffee and good conversations are reliably found, and whenever the weather allows, out on the terrace soaking up the increasingly scarce and precious sunlight. Always happy to grab a coffee and share ideas, whether about science, careers, anything in between, or well beyond.



Gustavo Monasterio's Team, Spring 2026.

Contact

gustavo.monasterio@ki.se

Pernilla Stridh appointed as docent in medical genetics

NEW APPOINTMENT

On 19 May 2026, the Docent Committee decided to appoint CMMer Pernilla Stridh as docent in medical genetics.

Pernilla Stridh is a team leader at the Department of Clinical Neuroscience, the Division of Neuro, and holds a PhD in experimental neuroscience from Karolinska Institutet, as well as postdoctoral training in sequence analysis and human genetics at the Wellcome Trust Centre for Human Genetics, University of Oxford, and Karolinska Institutet.

Her research focuses on the causes and processes underlying neuroinflammation and neurodegeneration, with a particular focus on the influence of genetic variants on disease severity and progression in multiple sclerosis. Her research has been funded by various grants from, among others, the Swedish Research Council and the DFG (Deutsche Forschungsgemeinschaft).

It is a pleasure to congratulate Pernilla Stridh on her new titles as docent!

Pernilla Stridh. Photo: Magdalena Lindén.

Lara Kular appointed as docent in epigenetics and epigenomics

NEW APPOINTMENT

The Docent Committee decided on the 19th of May 2026 to admit Lara Kular as docent in medical epigenetics and epigenomics.

Lara Kular is a Team Leader at the Department of Clinical Neuroscience, The Division of Neuro, with a PhD in Physiology and Physiopathology from the Pierre and Marie Curie University (Sorbonne Université, Paris) and postdoctoral training in clinical and functional epigenomics at Karolinska Institutet.

Her research focuses on the causes and processes underlying neuroinflammatory conditions like multiple sclerosis, with a special focus on the impact of smoking along the lung-brain axis. Her research was supported by various grants from the Swedish Research Council, the Brain Foundation, MS Foundation among others.

It is a pleasure to congratulate Lara Kular on her new title of docent and Associate Professor!

Lara Kular. Photo: Ulf Sirborn.

Major International Grant for Research on How Genetics and Smooth Muscle Cells Affect Atherosclerosis

FUNDING AND GRANTS

Ljubica Matic, CMM Group Leader and associate professor at the Department of Molecular Medicine and Surgery, Karolinska Institutet, has been awarded a grant from the Leducq Foundation, one of the largest international grants in the field of cardiovascular research.

Ljubica Matic. Photo: Tintin Vidhammer

The grant (9 million USD for totally 5 years) will be used within the international network ATHENA, which brings together researchers from the USA and Europe, and is coordinated by Prof Thomas Quertermous (Stanford, USA) and Helle Jørgensen (Cambridge, UK).

Ljubica Matic leads KI partnership in the ATHENA network (1.7 mUSD share), which aims to advance the field through identifying causal atherosclerosis genes related to smooth muscle cells and their mechanisms associated with the vessel wall pathologies. The ATHENA consortium will bridge gaps in atherosclerosis research by assembling expertise in population and cohort genetics, functional genomics and vascular biology, to identify and validate novel genetic variants and map their regulatory programs and pathways shared between coronary and carotid diseases using in vivo and in vitro models. The ultimate goal is to improve risk prediction and provide validated therapeutic targets for cardiovascular patients.

“Current therapies for atherosclerotic cardiovascular patients primarily aim at blood pressure, cholesterol lowering, and inflammation control. However, these interventions leave 30-40% of residual risk unexplained by the known modifiable factors and untreated. This highlights the critical need for approaches that address disease mechanisms not fully encompassed by current therapies and the rationale of ATHENA is that they should be primarily targetted to the vascular wall resident cells of which smooth muscle cells are the major portion. Moreover, atherosclerotic cardiovascular disease is highly heritable, with high percentage of risk attributed to genetic factors. Recent pharmacogenomic studies show that 63% of FDA-approved drugs in the past decade had supporting evidence from human genetic studies, underscoring the potential of translating genetic discoveries into therapies, another rationale of ATHENA. This network will open possibilities for us to study the connection among these factors in depth and how they can be harnessed for precision medicine strategies to protect long-term cardiovascular health”, says Ljubica Matic, Group Leader at CMM and at the Vascular Surgery unit at the MMK department, Karolinska Institutet.

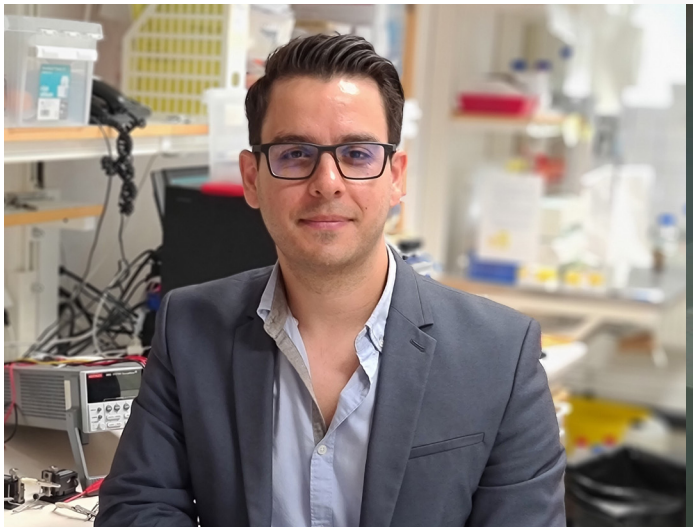
About ATHENA Leducq network
Atherosclerosis Targets from Human gEnetics and functional genomic Approaches

Coordinators:
Prof Thomas Quertermous, Stanford (USA)
Assoc Prof Helle F. Jørgensen, Cambridge (UK)

Partners:
Assoc Prof Ljubica Matic, Karolinska Institutet (Sweden)
Prof Samuli Ripatti, Helsinki University (Finland)
Prof Nathan Stitziel, Washington University (USA)

Karolinkska Institutet Consolidator Grants to Onur Parlak and Carolina Hagberg

FUNDING AND GRANTS



Onur Parlak. Photo: Magdalena Lindén.

Onur Parlak. Photo: Stefan Bladh.

The Karolinska Institutet Committee for Research decided on the allocation of the funding for ten Consolidator grants 2026 for researchers already employed by Karolinska Institutet. Two CMMers have been awarded with funding: Onur Parlak and Carolina Hagberg.

The awarded candidates, who were selected from 89 qualified applicants, will receive up to 1.2 million SEK per year over five years to be used for own salary. Up to 50 percent may be used for research related costs.

SSF - EU Horizon Europe Research Application Support

FUNDING AND GRANTS

The Swedish Foundation for Strategic Research (SSF) supports Swedish researchers in applying for grants within the Horizon Europe (HEU) program, the EU's framework programme for research and innovation. Out of a total of 36 applications, 11 were approved, sharing nearly 5.4 million Swedish kronor.

Among the selected applicants were CMMers Ioannis Parodis and Onur Parlak who have been awarded SEK 500 000 each for 2026-2027.

The support program allows researchers to cover their salary for certain months to focus on writing, travel costs to travel to a potential project partner, and professional help to improve their project writing.

Eurostars Funding to Eduardo Villablanca

FUNDING AND GRANTS

Eudardo Villablanca. Photo: Rickard Kilström

The genetically validated inflammasome pathway in Inflammatory Bowel Disease (IBD) offers the opportunity to develop novel drugs beyond the pathways targeted today.

Building on these premises, CMM Group Leader Eduardo Villablanca in collaboration with Mabylon has secured Eurostars funding for ASCEND, a €1.46 million collaborative project to advance MY012, a monoclonal antibody targeting extracellular ASC within the inflammasome pathway.

ASCEND brings together an exceptional consortium with Mabylon, Karolinska Institutet, and Ambiotis, combining human and animal disease models with biomarker development to position MY012 for clinical development as a highly differentiated therapy for IBD

Marie Sklodowska Curie Actions Postdoc Fellowship

FUNDING AND GRANTS

MSCA Postdoctoral 2025 Fellowship awarded to fellow Sonia Corral Leal and Principal investigator Camilla Engblom at CMM, the Division of Immunology and Respiratory Medicine, Department of Medicine, Solna and SciLifeLab for project the project titled: MAP-BC: Mapping antigenic niches of tumor-infiltrating B cells in triple-negative breast cancer. Congratulations!

Sonia Corral Leal. Photo: Private.

CRKI Translational Seed Grant

FUNDING AND GRANTS

CMM Group Leader Ning Xu Landén and Helena Ikonomidis Sackey receive a two-year Cancer Research KI (CRKI) Translational Seed Grant 2026 to study 'Wound–Cancer Crosstalk in Cancer Patients: How Surgical Wounds Shape Cancer Progression'. The grant is awarded for two years and amounts to SEK 975 000.

Grants from Swedish Private Foundations

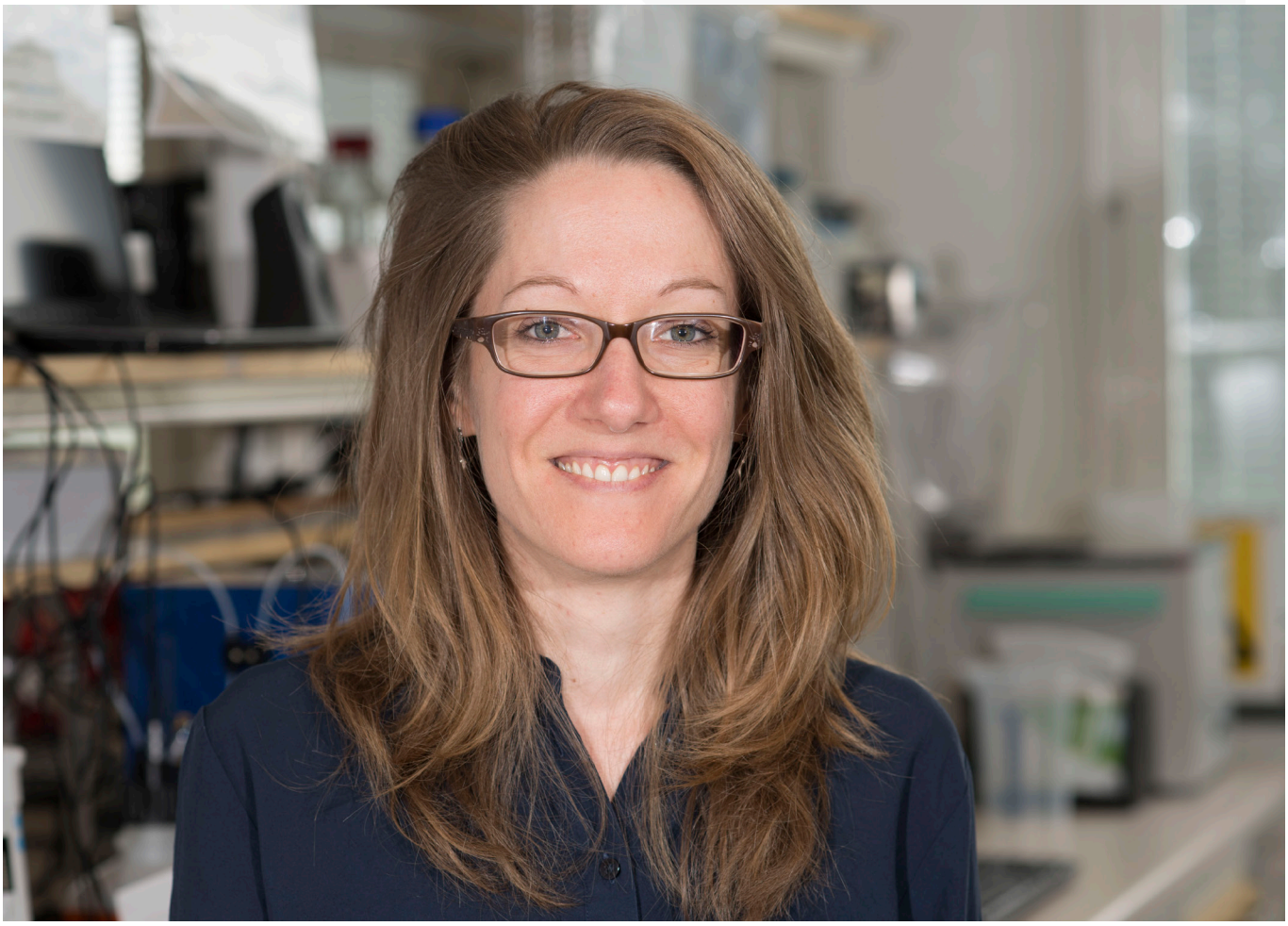
FUNDING AND GRANTS

CMM Team Leader Gustavo Monasterio has received a grant of SEK 150,000 from Ruth och Richard Julins stiftelse as well as a SEK 100,000 grant from Eva och Oscar Ahréns stiftelse.

Matthew Hunt was awarded a grant IBSA Foundation Fellowship Award of €32,000 for his project titled 'Mitochondrial dynamics as a functional vulnerability in NRAS melanoma',

CMM Postdoc Funding Awarded to Lara Kular's Research on Smoking, Lung and CNS Inflammation in Multiple Sclerosis

FUNDING & GRANTS



Lara Kular. Photo: Ulf Sirborn

We are pleased to announce that CMM Team Leader Lara Kular has been awarded funding within the CMM Postdoctoral Program for her research project proposal. The project will explore how smoking affects immune cells in the lungs and how these changes may contribute to the development and progression of multiple sclerosis (MS).

The CMM Postdoc Program supports competitive research projects with strong translational potential that align with CMM's mission.

Funding is awarded for a two-year postdoctoral position and can be used for salary and project-related running costs. The project proposals were reviewed and evaluated by the CMM Steering Group, and in the evaluations of the projects, particular emphasis was placed on scientific quality and innovation, scientific impact if successful, CMM interdisciplinarity as well as the applicant merits.

Congratulations Lara!

They receive an award for internationalisation in education

A pedagogic escape room for biomedicine from the summer school 2025. Photo: Private

AWARDS AND PRIZES

CMMer Rachel Fisher, together with Louisa Cheung and Jurga Laurencikiene, has been awarded the Prize for Internationalisation in Teaching and Learning 2026, a joint national award from the medical faculties in Sweden, for the international education initiative BalticSeaBioMed.

Rachel Fisher (CMM and department of Medicine Solna), together with Louisa Cheung, (department of Medicine Solna), and Jurga Laurencikiene (department of Medicine Huddinge) at Karolinska Institutet, has been awarded the prize for Internationalisation in Teaching and Learning 2026 by the national prize committee. The prize is a joint national award from the medical faculties in Sweden. It recognises successful and strategically important initiatives that strengthen internationalisation in education.

A collaboration between six universities

The prize honours the BalticSeaBioMed initiative, a strategically important long-term collaboration between six Nordic and Baltic universities that receives funding from Nordplus. Through shared online courses, annual international summer schools and innovative learning formats, the initiative reaches a wide student audience and addresses global challenges related to planetary health, environmental impact and sustainability.

Being part of the BalticSeaBioMed network is a very rewarding experience. It has strengthened internationalisation both within and beyond the formal curricula of our programmes and widened the perspectives of both students and teachers. It has been extremely fulfilling to perform pedagogical development work with colleagues from different countries and universities, according to the awardees.

Strong educational innovation

The nomination committee particularly highlights the initiative's strong educational innovation, including jointly developed digital courses and a virtual educational escape room.

The award was presented in connection with thedeans' meeting in Umeå and was received by Ewa Ehrenborg, Academic Vice President for Higher Education at Karolinska Institutet.

Rachel Fisher. Photo: Private

Some Publications

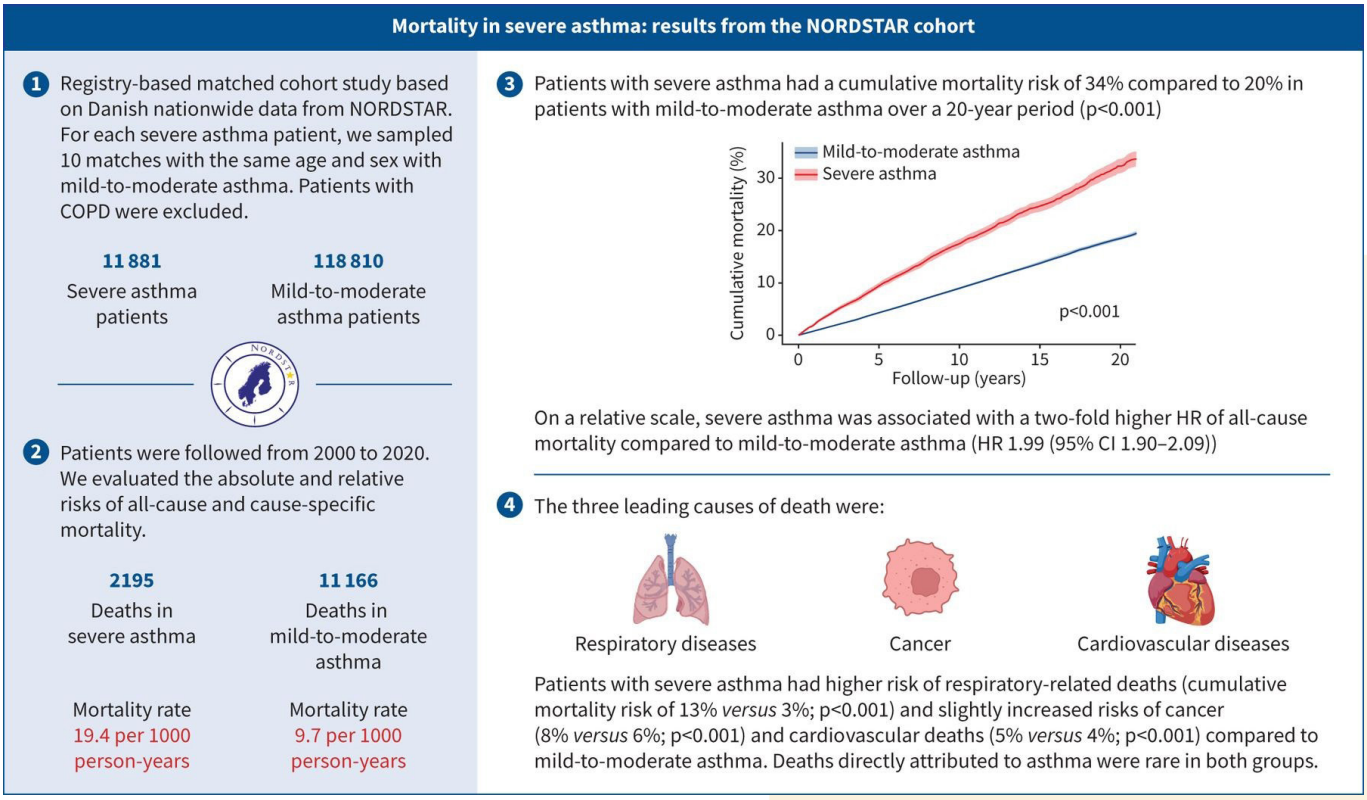
CMMers IN BOLD

Andersson L*, Roggia M *, **Wangriatisak K,** Skye R, Brittain HR, Youhanna S, Gil M, Ulven T, Haag M, Lauschke VM, **Chemin K**, Cosconati S, Kozielewicz P. AI screening and a conformational biosensor reveal a GPR183 inverse agonist and a switch mechanism for receptor activation. *Nat Comm* in press

Antczak P, Brandt P., Radosavljevic L., **Svenningsson P.**, Ruegg J., **Bečanović K.** Profiling of 5-hydroxymethylcytosine in blood reveals preferential enrichment at exon-intron junctions and predictive value for Parkinson's disease. *NPJ Parkinsons Dis*. 2026 Mar 20;12(1):76.

Manolakou T., Shen J., **Boddul S.**, Samiotaki M., Panagias M.A., Sentis G., Silva T.A., Argyriou A., Nikolopoulos D., Sanjiv K., **Chemin K., Wermeling F.**, Henriksson M., Slipicevic A., **Jakobsson P.J., Chatzidionysiou K.,** and Helleday T. Targeting NFATc1-driven MTHFD2 one-carbon metabolism to suppress sustained T cell-mediated inflammation in rheumatoid arthritis. *Nat Signal Transduct Target Ther,* in press

GRAPHICAL ABSTRACT



Hansen S, von Bülow A, Cooper A, Sandin P, Ernstsson O, Kankaanranta H, Janson C, Lehtimäki L, Aarli BB, Geale K, Hjoberg J, Packham S, Sekulic D, Altraja A, Backman H, Karjalainen J, Sverrild A, Backer V, Kauppi P, Yasinska V, Porsbjerg C, Ulrik CS, **Bossios A**. Mortality in severe asthma: results from the NORDSTAR cohort. *Eur Respir J*. 2026 Mar 5;67(3):2501289. doi: 10.1183/13993003.01289-2025.

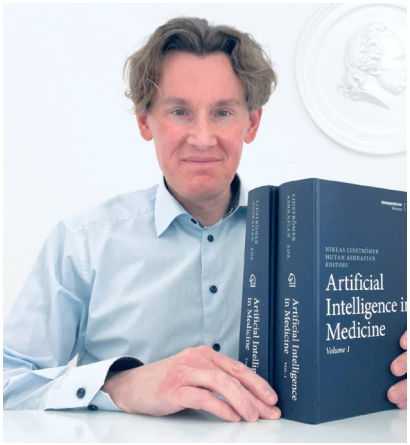
Dissertation on AI-driven medical innovation

PAST DISSERTATIONS

Niklas Lidströmer has defended his doctorate in Copenhagen, presenting a long-term, groundbreaking research project exploring how AI can be integrated into healthcare in a safe and ethical way.

Dr Niklas Lidströmer is a physician and senior researcher with particular focus on how artificial intelligence can be integrated ethically and safely into healthcare. He has recently defended his doctoral dissertation in Copenhagen. The Principal Scientific Supervisor of the thesis was CMM Group Leader Eric Herlenius.

The dissertation marks a milestone in a 16-year research project on artificial intelligence in medicine and health informatics. Throughout his career, he has worked clinically in eight countries, which has given him a broad global perspective on medicine and technology.



From Idea to Doctorate
Niklas's research project is based on a concept he himself developed: Global Patient co-Owned Cloud, abbreviated as GPOC. The concept concerns creating AI-integrated global systems for patient records that are both secure and controlled by patients themselves.

"I attempted to launch this concept as early as 2010, and now, over 30 publications and three books later, the time is more mature," says Niklas.

The fundamental idea behind GPOC is that patients should be able to co-own and control their own health data whilst allowing that data to be used for medical research in an anonymous manner. The system is built on advanced technologies such as blockchain, encryption, and so-called federated learning – methods that make it possible to research large datasets without compromising security.

Complex Security System
The security solution is comprehensive and technically advanced. It is built on an intricate system of blockchain, homomorphic encryption methods, federated learning, fog computing, and edge architecture. Niklas also employs a technology called ZK-Snarks, which enables ultra-fast and secure data verification.

The research extends far beyond pure technology. It also encompasses ethical, philosophical, legal, and economic considerations regarding how such a solution should be designed and launched globally.

Democratisation of Healthcare
According to Niklas, his research fundamentally concerns "building and launching an AI-integrated medical solution that is ethically, philosophically, economically and legally correct, enabling global research on very large quantities of health data, democratising healthcare and medical science."

A central part of the vision is the ability to research large quantities of health data from around the world, which could accelerate medical research and the development of new treatments. Simultaneously, Niklas emphasises the importance of patients retaining control over their own information and that access to artificial intelligence in medicine is distributed fairly.

Defence by Dr Niklas Lidströmer.
Photo: N/A

"It is also about contributing to enlightenment, insight, and health education," he says.

International Collaboration Going Forward

Following his dissertation defence, Niklas plans to build further on his work through continued multinational collaboration, more lectures and international seminars, and increased teaching. An important next step is to complete a finished product for the global market.

He speaks several languages and has worked as a specialist physician in Sweden, Denmark, Norway, Switzerland, the United Kingdom, Australia, France, Spain, and the Faroe Islands. This international experience has shaped his ambition to create global solutions for medicine and healthcare.

The dissertation represents, according to Niklas, "a milestone and a recognition."

"It also means," he says, "approval to continue on the professorial track – something that is entirely in line with his extensive publications and citations within the field."

With the dissertation completed, Niklas now stands on the threshold of the next chapter in his career as a researcher and innovator in medicine and artificial intelligence.

The text is based on an article from the Karolinska Institutet website.

KIRCNET

Cardiovascular Research

Save the date for the Cardiovascular Research Retreat

November 26 – 27, 2026

Confirmed invited speakers:

- **Jolanda van der Velden,** PhD, Amsterdam, UMC
- **Paul Franks,** PhD, Lund University
- **Eoin Brennan**, PhD, UC Dublin
- **Niels Riksen**, PhD Radboud University,
- **Fabrizia Bonacina**, PhD, University of Milan
- **Judith Sluimer**, PhD CARIM, Maastricht
- **Hester den Ruijter**, PhD. University of Edinburgh
- **Thomas Guzik**, MD, PhD, University of Edinburgh

Venue details to be announced shortly
Preliminary program and abstract deadlines will be announced shortly!

Topics include cardiomyopathies, genetics and cardiometabolic risk, diabetes vascular complications, cardiovascular immunology, dyslipidemia-drive, hypoxia, endothelial to mesenchymal transition, sex differences in cardiovascular disease, hypoxia and oxidative stress.

Karolinska Institutet | KAROLINSKA UNIVERSITETSSJUKHUSET | CVP Cardiovascular program @ Karolinska Institutet

CMM Leadership & Mentor Program

CMM EVENTS

CMM has delivered a Leadership & Mentor Program to support early-career research leaders, combining training, mentorship, and community-building to strengthen their path toward independent research leadership.

CMM has over the past year organized a Leadership & Mentor program to support junior Group Leaders, Team Leaders and early career researchers at CMM in various aspects of running an independent research group. A second main goal for the initiative was to build a strong and supportive community of young research leaders at CMM. The intent of the program was to complement other initiatives and courses which are provided on campus.

The one-year program combined leadership and grant writing training, with mentor sessions for each course participant. The personal leadership sessions were headed up by Jonas Mosskin, from the MiL Institute, and our own Eduardo Villablanca provided highly appreciated training and insights regarding how to write high quality and successful grant applications.

The final and fourth program for the program was held in May 2026, at Åkeshofs Slott. This final session focused on personal leadership, including conflict management and resolution.

The program ended with a social session and dinner, to which several mentors were attending.

Participants and mentors, CMM Leadership & Mentor Program.
Photo: Kristina Edfeldt

CMM Seminar Series

CMM EVENTS

Photos from the seminar and mingle with professor Ivaylo Ivanov, who gave seminar titled "Gut Immunity". Photos: Magdalena Lindén.

On May 21 CMM hosted another well-attended seminar as part of the CMM Seminar Series. This time, we had the pleasure of welcoming Professor Ivaylo Ivanov from Columbia University in New York as our guest speaker.

Nominated by Eduardo Villablanca, who also served as his host, Professor Ivanov took the audience on a scientific journey into the world of gut immunity.

Following the seminar, attendees enjoyed a pleasant networking reception, offering the opportunity for discussions with Professor Ivanov and continued scientific exchange.

Welcome to nominate speakers for the CMM Seminar Series 2026/2027

We would like to get your nominations of excellent Swedish and/or international scientists that could be of broader scientific interest to the CMM community.

The nominations should include a brief description of the speaker's scientific profile and relevance to the CMM scientific community (not to exceed more than one page).

Please send your nominations to CMM Communication communication@cmm.se (no specific deadline). Selection of speakers will be made by the CMM Steering Group.

CMM will (together with the nominator) arrange a scientific programme for the invited speaker, hosting the seminar as well as providing the opportunity for networking reception after the talk, with some drinks and light bites. For a selected number of guests/speakers CMM can also contribute towards travel and accommodation costs if required.

Property Management Update

Renovation work in the area outside CMM Lecture Hall

The renovation of the area in front of the CMM Lecture Hall on floor 00 has started. It involves, among other things, installation of new flooring, renovation of the restrooms and cloakroom, installation of a countertop and water fountain, installation of microwave ovens, installation of glass walls and doors, installation of perimeter security, and new furnishings.

The work is expected to take 10–11 weeks, and the plan is for the area to be ready for use by week 35 (August 24–30).

A timeline for the different parts of the project will be posted in the entrance area.

The project manager hired by CMM for this work is Tobias Ulrich (TU-Consulting). You can contact him if you have any questions:

Tobias Ulrich
Mobile: +46 76 941 95 33
Email: tobias@tuconsulting.se

Important to remember::

- The access control to the corridor on floor 00 will be temporarily removed during the renovation. For this reason, the entire CMM building will be secured to prevent unauthorized access. **A card and code will be required to enter through the main entrance during part of the renovation**. Visitors invited to CMM must be personally let in at the main entrance on floor 00.
- During the construction period, the Convini self-service fridge will be removed and later reinstalled in the new kitchen. **It will not be possible to purchase food or snacks at CMM over the summer.**
- New bookings for the lecture hall will not be possible during the renovation period. **If access to the lecture hall is needed between June 15 and August 30, please contact Tobias Ulrich at least two days in advance so that the work can be planned accordingly.**

Thank you in advance for your understanding and collaboration.

New Handyman

Tommy Hildebjer from Veterankraft is helping out with smaller tasks on Tuesdays and Fridays.

If you need Tommy to fix something, please send a request to Helpdesk: helpdesk@cmm.se

Tommy Hildebjer. Photo: Kristina Edfeldt.

Coffee Machine Reminder

The coffee machines in the lunch rooms on floors 00, 01, 02, 03 and 04 are programmed to provide ready-made coffee from 7 am until 8 pm, Monday to Friday.

Please abstain from trying to brewing/taking coffee in these machines outside of those hours or during the weekend, since starting the machine then cancels programmed automatic cleaning.

If you want to take coffee outside the above mentioned hours or during weekends, please use the coffee machine on floor 05.

During the renovation work at floor 00, the common coffee machine outside the restrooms will not be available.

Thank for your collaboration!

Next deadline for sending in contributions to CMM News: 27th of August.

Center for Molecular Medicine Foundation
L8:05 | Karolinska University Hospital
SE-171 76 Stockholm, Sweden
E-mail: communication@cmm.se

Editor: Magdalena Lindén
Layout: Edna Fagerstedt