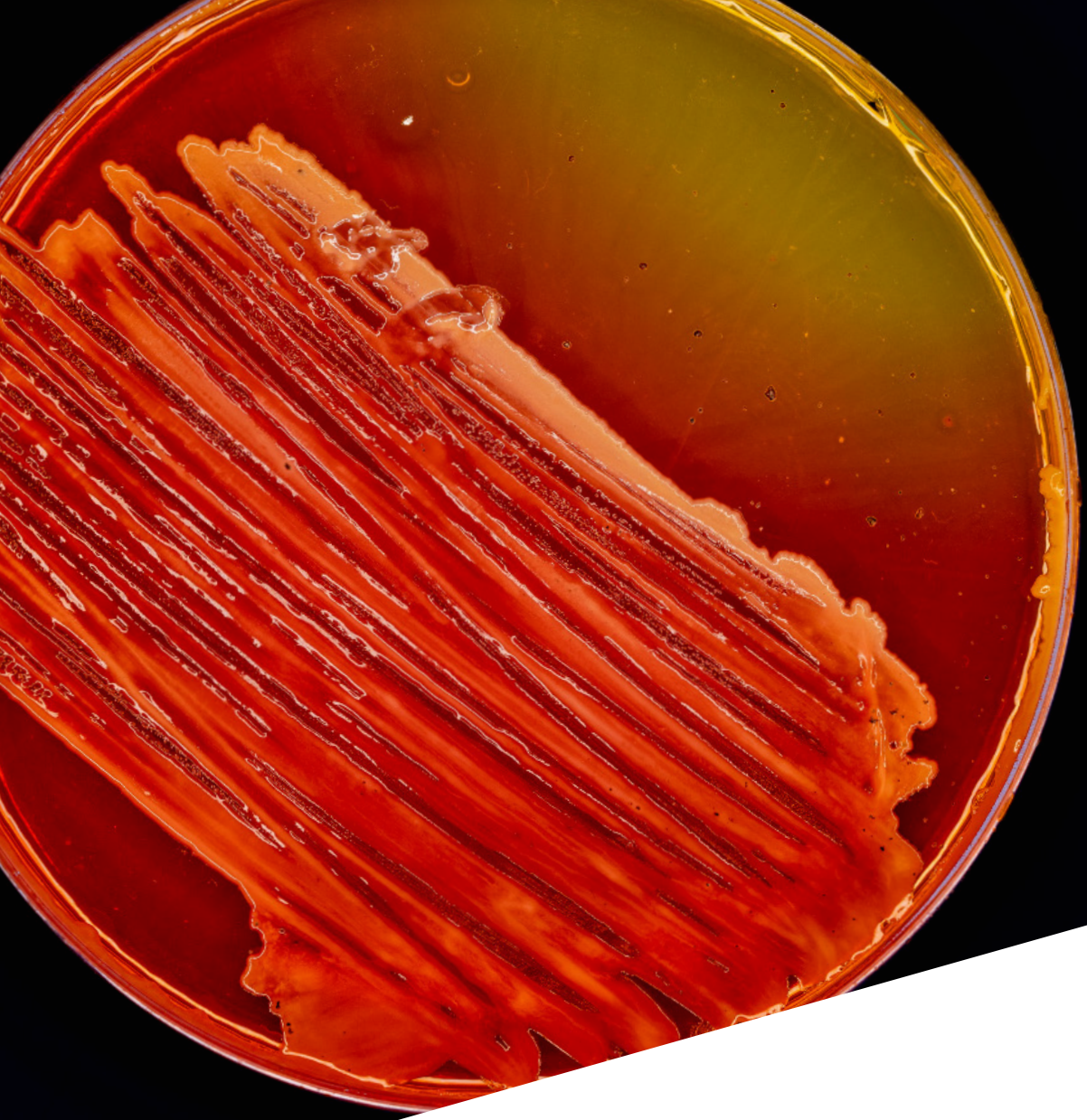


CENTRE FOR ANTIBIOTIC RESISTANCE RESEARCH IN GOTHENBURG

CARe

ANNUAL REPORT 2025

CHALMERS UNIVERSITY OF TECHNOLOGY | UNIVERSITY OF GOTHENBURG

CONTENT

"We foresee that we can intensify activities within several areas"

Where we are TODAY

WORDS FROM THE CENTRE DIRECTORS

We are very grateful for the support during the past years from the Västra Götaland Region, the Sahlgrenska University Hospital, Chalmers University of Technology, the Sahlgrenska Academy and the Faculty of Science and IT at the University of Gothenburg. But with the end of financial commitments in sight, 2025 was characterized by significant uncertainty for CARe. This changed by the end of the year through the decision by the Zachariassén family foundation for research and other education to fund CARe with 20 MSEK for the coming five years.

The mission of the foundation is to support one research centre at a Swedish university within the area of "Societal development from a global perspective". This is a very broad scope, covering literally all fields of science. We are therefore particularly pleased to see that the foundation chose to fund CARe and research on antibiotic resistance as a prioritized global societal challenge.

With an expanded budget, we foresee that we can intensify activities within several areas including internationalization, interdisciplinary research, communication, and efforts to stimulate translational impact. We are looking forward to the new opportunities this funding has brought us and are excited to start 2026 with many new ideas and inspirations from the CARe community.

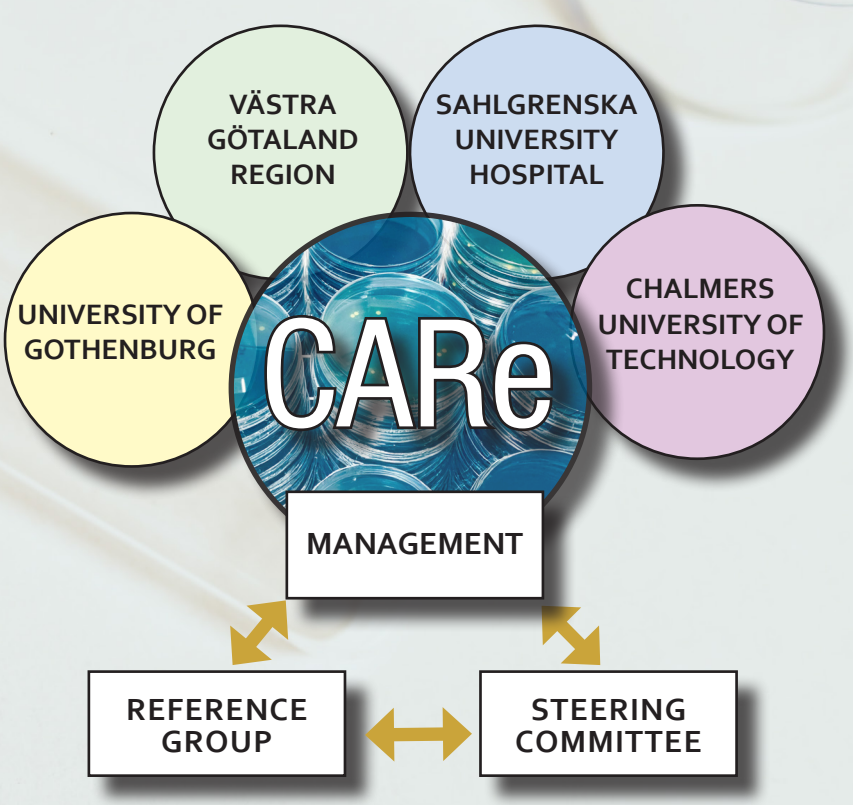
Joakim Larsson and Michaela Wenzel

ABOUT CARe

CARe represents a collaborative venture between the University of Gothenburg, Chalmers University of Technology, the Västra Götaland Region and the Sahlgrenska University Hospital.

This interdisciplinary initiative bridges healthcare, academia and regional stakeholders with a joint vision to limit mortality, morbidity and socioeconomic costs related to antibiotic resistance on a global scale through research.

CARe provides a regional network that facilitates cross-disciplinary interactions and collaborations.



CHALMERS UNIVERSITY OF TECHNOLOGY

- Life Sciences
- Architecture and Civil Engineering
- Chemistry and Chemical Engineering
- Mathematical Sciences

UNIVERSITY OF GOTHENBURG

- Biomedicine
- Biomaterials
- Medical Biochemistry and Cell biology
- Medicine
- Philosophy, Linguistics and Theory of Science
- Biological and Environmental Sciences
- Chemistry and Molecular Biology
- Economics
- Education, Communication and Learning
- Journalism, Media and Communication
- Marine Sciences
- Mathematical Sciences
- Political Science
- Global Studies

161
MEMBERS FROM
19
DEPARTMENTS

NEW CORE FUNDING

In 2025, CARe received a five-year grant from the Zachariassén Family Foundation for Research and Other Education. The funding provides an important foundation for the continued development of the centre and marks a transition into a new phase of work, characterised by longer planning horizons and increased capacity for coordination, collaboration and external engagement.

CARe addresses antibiotic resistance as a complex global societal challenge spanning human health, animal health and the environment. The centre brings together expertise from a wide range of disciplines and departments, but its ability to function as a coherent research environment depends on resources that support collaboration, communication and integration across fields. The grant enables CARe to strengthen this shared infrastructure and to support activities that are not easily funded through traditional project-based research grants.

The funding supports core functions that allow CARe to operate as a centre rather than a collection of individual research projects. This includes coordination and leadership, structured arenas for interdisciplinary exchange and sustained engagement with partners, policy actors and societal stakeholders. It also ensures continuity in activities that contribute to the translation of research into policy-relevant knowledge and practice.

Over the funding period, CARe will further develop platforms for collaboration, including internal scientific meetings, thematic workshops, international conferences and digital formats for knowledge exchange. Support for international researcher mobility and short-term exchanges strengthens existing collaborations and facilitates new ones, particularly in global health and low- and middle-income country contexts. The funding also enables CARe to expand educational and outreach activities, including international courses and open learning resources.

By providing stable resources over several years, the grant supports long-term capacity building and strategic planning. It creates opportunities to respond to emerging research questions and societal needs, stimulate new interdisciplinary collaborations and support early-stage research initiatives that may later develop into externally funded projects.

CARe is grateful for the support from the Zachariassén Family Foundation. The grant plays an important role in enabling the centre to con¬-tinue its work in a structured and sustainable manner and to further strengthen its role as a research environment addressing a critical global societal challenge.

RESEARCH HIGLIGHTS

CARe addresses antibiotic resistance as a complex, interconnected societal challenge spanning human health, animal health and the environment. The centre integrates research from the natural and medical sciences as well as perspectives from the humanities and social sciences. Research questions addressed span from understanding basic biological mechanisms to broader societal dimensions of resistance.

By bringing together expertise from an unmatched width of disciplines, CARe has a unique ability to approach research questions from multiple perspectives and to generate knowledge that is both scientifically robust and relevant to policy and practice.

CARe researchers primarily disseminate their results through peer-reviewed scientific publications, complemented by targeted outreach and communication activities, as outlined in this report and through our centre's communication channels, including the website www.gu.se/en/care

During the year, CARe researchers published four original research articles in *Nature Communications*, reflecting the centre's continued strong contribution to high-impact international research.

Municipal wastewater often favours non-resistant bacteria

A study of untreated municipal wastewater from 47 countries shows that wastewater often favours non-resistant bacteria rather than resistant ones. While some samples selected for resistant *E. coli,* most suppressed resistance. This challenges the view of municipal wastewater as a universal hotspot for resistance development.

The researchers also measured antibiotics and antibacterial biocides in all samples. Although some substances were found at levels that could promote resistance, no single compound explained the resistance selection observed at some sites. The results show that resistance comes with a biological cost when antibiotic levels are low, and provides important input to where mitigations are most warranted.

Published in Nature Communications: Yu et al, 2025. *Antibiotic resistance selection and deselection in municipal wastewater from 47 countries*

Antibiotic resistance in Africa

A large-scale study shows that antibiotic resistance in Africa is more widespread and severe than previously reported. By analysing routine laboratory data from 14 countries, the research provides the most comprehensive overview to date and reveals very high resistance levels in common bacteria such as *E. coli* and *Klebsiella pneumoniae.*

Resistance was particularly high to third-generation cephalosporins, which are often among the last available treatment options. The results show that older male inpatients are especially affected and highlight how limited access to healthcare, repeated hospital stays and hospital-acquired infections contribute to the problem. The study also introduces a Drug Resistance Index that links resistance levels with antibiotic use and can support clinical decision-making and national policy development. The findings underline the need for stronger surveillance, infection prevention and more effective antibiotic stewardship.

Published in PLOS Medicine: *Osena at al, 2025. Antimicrobial resistance in Africa: A retrospective analysis of data from 14 countries, 2016–2019*

Antibiotic choice for urinary tract infections in men

A large Swedish registry study shows that men with uncomplicated urinary tract infections without fever can be safely treated with narrow-spectrum antibiotics. The risk of recurrence and serious complications was very low and differences compared with broad-spectrum treatment were small.

The study included almost 40,000 men treated in primary care in Västra Götaland between 2012 and 2019 and followed patients for 30 days after treatment. Serious complications such as sepsis were rare. The results support Swedish guidance that recommends narrow-spectrum antibiotics as a first-line option for uncomplicated infections, while broader treatment should be reserved for more complex cases.

Published in Infectuos Diseases: Snaebjörnsson et al, 2025. *Narrow-spectrum antibiotics to male patients with acute cystitis – a retrospective longitudinal study*

Gilbert Osena, PhD-student and first author of the study Antimicrobial resistance in Afric a: A retrospective analysis of data from 14 countries, 2016–2019

Swedes willing to pay for cleaner antibiotic production

Social science research shows strong public support in Sweden for reducing environmental pollution from antibiotic production. A clear majority of respondents said they are willing to pay more for antibiotics manufactured under stricter environmental control, either through a higher price at the pharmacy or through taxation that funds a state subsidy.

The study included just over 2,000 participants and shows that concern about antibiotic resistance and global health drives this willingness to pay. On average, respondents accepted a substantial price increase per treatment or a small annual tax increase. The results highlight broad support for policy measures that reduce emissions linked to antibiotic resistance and stress shared responsibility rather than consumer choice alone.

Published in Ecological Economics: Lampi et al, 2025. *Willingness to pay for antibiotic pollution control*

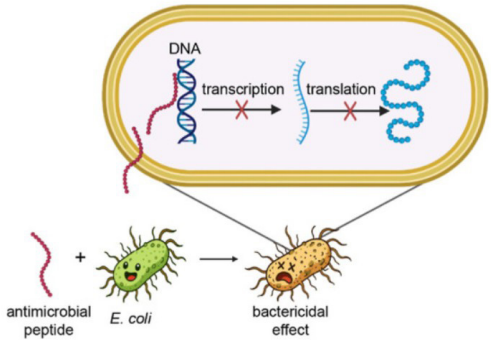
Marine-inspired peptides that target bacterial DNA

This study investigates two new antimicrobial peptides, L3 and L3-K, identified through genome mining of Streptomyces and refined with sequence engineering. Unlike many antimicrobial peptides, these candidates are serum-stable and act without lysing bacterial membranes, making them promising scaffolds for alternative antimicrobial strategies.

Using quantitative proteomics in uropathogenic *E. coli,* the researchers showed that both peptides rapidly trigger broad changes in bacterial protein expression, including disrupted nutrient uptake via ABC transporters and strong stress responses. Follow-up experiments demonstrated that the peptides bind DNA non-specifically (L3 more strongly than L3-K) and potently inhibit transcription and translation. Importantly, the inhibitory concentrations matched the peptides' minimum inhibitory concentrations, linking DNA binding and interference with core information processing directly to antibacterial activity.

The findings highlight a non-lytic mode of action where the peptides primarily kill bacteria by targeting DNA and shutting down gene expression, offering a potential route to next-generation antimicrobials with reduced reliance on membrane disruption.

Published in ACS Infectious Diseases: Beyer et al, 2025. *Marine-Inspired Antimicrobial Peptides Disrupt Gene Expression at the DNA Level*

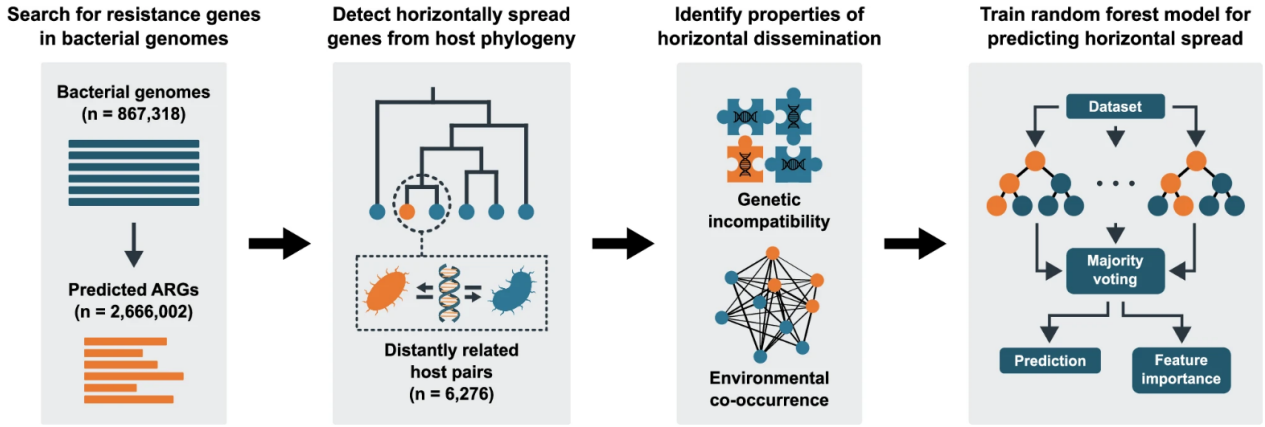


Peers and norms shape antibiotic prescribing

This paper shows how social norms influence doctors' decisions to prescribe antibiotics. Prescribing behaviour is strongly linked to doctors' beliefs about how colleagues act. Doctors who perceive their peers as restrictive are more likely to limit their own prescribing.

The analysis also shows a link between private and professional behaviour. Doctors who avoid antibiotics in their personal lives tend to be more cautious in clinical practice. The results highlight the importance of supporting a culture of restraint in healthcare, where peer behaviour and visible good practice support responsible antibiotic use and help slow the development of resistance.

Published in Kyklos: Carlsson et al, 2025. *Beliefs of Peers' Behavior, Clinical Guidelines and Private Attitudes to Antibiotics as Drivers of Antibiotic Prescribing*



Overview of how large-scale genomic data and environmental information were combined to identify and predict horizontal transfer of antibiotic resistance genes. Adapted from Lund et al., Nature Communications (2025).

Predicting how resistance genes spread

This research maps when and where mobile antibiotic resistance genes are most likely to spread between bacteria through horizontal gene transfer.

Nearly one million bacterial genomes were analysed to identify thousands of likely transfer events between distantly related bacteria. These data were combined with more than 20,000 metagenomes from animal, human, soil, water and wastewater microbiomes to build machine learning models that can predict gene transfer. The results show that genetic incompatibility reduces the likelihood that resistance genes will establish in new bacterial hosts, especially across large evolutionary distances. In contrast, ecological connectivity increases the likelihood of transfer. Bacteria that co-occur in the same environments are more likely to exchange resistance genes, with particularly strong patterns seen in human-associated microbiomes and in wastewater. The findings provide a data-driven basis for forecasting spread and for targeting surveillance and prevention efforts.

Published in Nature Communications: Lund et al, 2025. *Genetic compatibility and ecological connectivity drive the dissemination of antibiotic resistance genes*

Valuing access to effective antibiotics

This research presents a comprehensive framework for assessing the full value of access to effective antibiotics. The so called 3D Value Framework addresses limitations in traditional methods for valuing medicines, which often focus only on direct treatment effects. Instead, the framework captures a wider set of values that are central to antibiotic use, resistance management and public health.

The framework can be applied across areas that influence sustainable access to antibiotics, including resistance prevention, investment in new antibiotics, supply security and global health support for low and middle income countries. It highlights that effective antibiotics generate value not only through use in individual patients but also through preparedness, where access is maintained even when use must be restricted to slow resistance. By clarifying these value dimensions, the framework supports better informed decisions in healthcare policy, priority setting and long term strategy.

Published in Health Care Analysis: Herlitz et al, 2025. *The 3D Value Framework for Sustainable Access to Effective Antibiotics*

Metabolic adaptation to low-dose carbapenem exposure

This study examines how a carbapenem-resistant strain of *Klebsiella pneumoniae* responds to sublethal exposure to the antibiotic ertapenem. Using quantitative proteomics, the researchers analysed global changes in protein expression beyond established resistance mechanisms such as carbapenemases.

Exposure to low ertapenem concentrations induced a coordinated but limited proteomic response, primarily affecting pathways related to cell wall integrity, metabolism, energy production, stress response and biofilm formation. While the main carbapenemase (VIM-1) increased in abundance, most other resistance-associated proteins showed only minor changes, indicating that existing genetic resistance reduces the need for extensive adaptation. However, several pathways linked to tolerance and survival under antibiotic stress were activated, potentially priming the bacteria for increased resistance at higher drug concentrations.
The findings provide insight into bacterial responses to low antibiotic levels in clinical and environmental settings and highlight metabolic and regulatory pathways that may contribute to tolerance and long-term adaptation.

Published in International Journal of Molecular Sciences: Jaén-Luchoro et al, 2025. *Insights into the Metabolic Adaptations of a Carbapenem-Resistant Klebsiella pneumoniae Strain on Exposure to Sublethal Concentrations of Ertapenem*

CARe researchers highly cited worldwide

In 2025, two researchers affiliated with CARe were included in Clarivate Analytics' list of the world's most highly cited researchers. The researchers are Johan Bengtsson-Palme at Chalmers University of Technology and Joakim Larsson at the University of Gothenburg.

Recognition through the Areas of Advance prize

In 2025, Chalmers Areas of Advance prize was awarded to Erik Kristiansson, Michaela Wenzel and Fredrik Westerlund for their contributions to the development and strengthening of CARe. The award recognises sustained efforts to build and consolidate an interdisciplinary research environment addressing antibiotic resistance as a major global societal challenge.

Erik Kristiansson, Michaela Wenzel and Fredrik Westerlund

The awarded researchers have played key roles through leadership, coordination and strategic engagement, contributing to the relaunch and further expansion of the centre.

The Areas of Advance prize acknowledges the importance of coordinated, interdisciplinary research environments in addressing complex global health challenges and recognises CARe as a model for long-term collaboration across institutions and disciplines.

EU-INITIATIVE: SHIELD

SHIELD is an international research initiative addressing implant-associated infections, a persistent challenge in modern healthcare with implications for patient safety, antibiotic use and long-term treatment outcomes.

Coordinated from the University of Gothenburg, the project has received more than EUR 4.7 million in funding through the Marie Skłodowska-Curie Doctoral Networks programme, supporting a long-term research and training environment.

SHIELD brings together expertise in biomaterials science, regenerative medicine and translational research to study how infections arise at the implant interface and to develop strategies for their prevention and management. The research focuses on antibacterial materials, surface modifications and alternative therapeutic approaches that reduce bacterial attachment while supporting tissue integration and healing.

The project involves universities, research institutes, hospitals and industry partners in eleven countries. Its doctoral training programme includes sixteen new PhD candidates, with opportunities for international mobility across academia, healthcare and industry. Three of the doctoral positions are based in Gothenburg, strengthening the local research environment.

Through the integration of advanced research, international collaboration and researcher training, SHIELD contributes to sustainable approaches to infection prevention and treatment and aligns aligns closely with CARe's mission to inform clinical practice and help mitigate antibiotic resistance. More information is available at: www.shield-dn.eu/en

Margarita Trobos, Associate Professor at the Institute of Clinical Sciences, is the coordinator of the EU-funded SHIELD doctoral network

ADVICING POLICY

During the year, CARe researchers continued to contribute to tangible societal impact through close collaboration and advisory roles withpublic authorities, international expert bodies and global research infrastructures.

CARe continued to contribute to national and international policy development on antimicrobial resistance. This included for example support to the Swedish Medical Products Agency and the Swedish Board of Agriculture and the Public Health Agency of Sweden within the BALTOHOP initiative. The initiative aims to support the Baltic countries in the development and implementation of National Action Plans on AMR. CARe also contributed to Sweden's response on how antimicrobial resistance should be monitored in wastewater under the revised Urban Waste Water Treatment Directive, coordinated by the Public Health Agency of Sweden.

Our director received continued trust to act as an advisor to the Swedish Minister for Social Affairs Jakob Forssmed in his role as Vice Chair of the Global Leaders Group on Antimicrobial Resistance. During 2025, the minister's expert advisory group, consisting of Joakim Larsson, Otto Cars and Susanna Sternberg Lewerin, was expanded to also include Daniel Carelli from CARe.

CARe has also participated in meetings arranged by the Quadripartite (UN agencies) related to the establishment of the upcoming international evidence panel on AMR.

During 2025, Joakim Larsson received re-newed trust as an advisor to the Access to Medicines Foundation and continued as a member of the Antimicrobial Resistance Benchmark Expert Review Committee for the 2026 benchmark.

CARe was also represented among the panellists at a seminar organised by the Medical Products Agency and RAGNA focusing on emissions from antibiotic manufacturing and waste management.

In September 2025, CARe participated in stakeholder dialogue meetings at the Ministry of Health and Social Affairs.

CARe networked with Swedish authorities and other actors in the field of AMR at the yearly Swedish Antibiotic Forum in Jönköping.

Jakob Forssmed, Minister for Social Affairs and Public Health

Christian Munthe and Joakim Larsson at Antibiotikaforum in Jönköping

Christian Munthe highlighted ethical aspects of antimicrobial resistance through an invited oral presentation.

Erik Kristiansson maintained an ongoing collaboration with the Public Health Agency of Sweden focused on the surveillance of bacterial infections and antibiotic resistance. This work supports national monitoring efforts and contributes to evidence-based decision-making in public health.

In parallel, Kristiansson took up a role as co-director of the Data-Driven Life Science programme, DDLS, a national initiative hosted by SciLifeLab. Through this position, he contributes to strengthening data-driven research capacity in Sweden, with relevance for antibiotic resistance research across disciplines.

RECOGNITION OF IMPACT

CARe's research continues to be recognised for its high scientific quality and real-world relevance, reflected in top ratings in national research evaluations and contributions to international guideline development.

In the Swedish Research Council report "Quality and impact of research in basic medicine in Sweden" published in 2025, The research on antibiotics and environmental drivers of antibiotic resistance by Joakim Larssons research group received the highest possible rating (4+). Only seven additional case studies were awarded the same score. The evaluation covered Swedish medical and pharmacological research over the past twenty years.

Margarita Trobos contributed to international guideline development within the field of orthopaedic infections through her involvement in the 3rd International Consensus Meeting on Orthopedic Infections, held in Istanbul in May 2025. The meeting brought together more than 1,200 international experts with the aim of developing evidence-based recommendations to improve patient care worldwide.

As part of the ICM process, Trobos co-authored several systematic review documents addressing key challenges in implant-associated infections, including the evaluation of antimicrobial properties of orthopaedic implants, the role of biofilms in treatment outcomes and the relevance of different measures of antimicrobial efficacy. This work feeds into internationally used consensus documents that inform both clinical practice and future research.

ONLINE PRESENCE

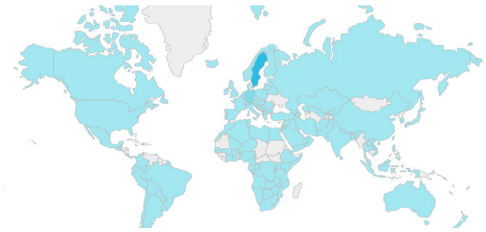
CARe continued to strengthen its communication efforts throughout the year, with a clear focus on visibility, accessibility and relevance for both academic and societal audiences.

The centre's LinkedIn page grew steadily and reached almost 700 followers, serving as an important channel for sharing research-related news, publications, events and ongoing activities with a growing international professional network.

Traffic to CARe's website increased markedly, with more than 9450 visitors during the year, compared with just over 5,700 visitors in 2024.

Visitors came from 147 countries, reflecting the centre's broad international reach.

Page views	Unique visitors
17 108	**7 407**



The website provides an overview of CARe's activities, goals and contributions to antibiotic resistance research and serves as an important platform for communicating research outputs, events and outreach activities to both academic and societal stakeholders. CARe also published research related news on an ongoing basis, highlighting activities, research results, events and collaborations.

MEDIA

CARe's research and researchers received broad media attention during the year across national and regional channels. Contributions included interviews, podcasts, news features and debate articles addressing antibiotic resistance, data-driven research and global collaboration.

Several CARe researchers participated in broadcast media, including podcasts and radio programmes. Michaela Wenzel took part in a podcast interview on international research collaboration and antibiotic resistance, while research environments at the centre were highlighted through television reporting, including a visit by Västnytt to Joakim Larsson's laboratory.

Research findings published during the year generated substantial media interest. A study on factors influencing antibiotic prescribing, co-authored by Johan Bengtsson-Palme, was disseminated through a coordinated press effort and received coverage in a wide range of outlets, including Dagens Medicin, Läkemedelsvärlden, Läkartidningen, Sveriges Radio, Göteborgs-Posten and TT/Omni. Bengtsson-Palme also discussed the findings in regional radio, contributing to broader public discussion on antibiotic use and prescribing practices.

Another press release on AI-based prediction of bacterial multi-resistance achieved wide reach and was featured in major Swedish newspapers as well as national television news. In addition, CARe researchers contributed to public debate through opinion articles in national and regional newspapers, and the centre's work was highlighted through features and video productions by research funders and partner organisations.

During the year, CARe researchers also contributed to public debate through opinion articles in national and regional newspapers. These contributions addressed the societal risks of increasing antibiotic resistance and the need for long-term, evidence-based strategies to preserve effective antibiotics.

PhD student Noel Waters interviewed by a TV-team from Västnytt


Göteborgs-Posten
Prenumerera
Logga in
Debatt
Snart har vi inga fungera
antibiotika kvar – då k
PUBLICERAD 21 AUGUSTI 2025
nästa pandemi
innan den bryter ut
De vill ligga steget före framtidens virus och antibiotikaresistens!
Nu är de äntligen här – filmerna med Framtidens Forskningsledare-8! Först ut är Johan Bengtsson Palme vid Chalmers Tekniska Högskola:
Covid orsakades av virus, men pandemier kan likväl orsakas av bakterier. Johan Bengtsson Palme och hans forskargrupp vid Chalmers Tekniska Högskola försöker se in i framtiden för att förstå vilka som kan orsaka nästa pandemi.
Vi kan inte bara vänta på att all antibiotika slutar att fungera
Debatt • Antibiotikaresistens är en pandemi som till skillnad från viruspandemier som influensa och Covid-19, inte kommer och går. Den är i stället ständigt närvarande, förvärras, och kommer att pågå så länge världen är beroende av antibiotika för att basal och högspecialiserad sjukvård ska fungera. Nuvarande nationella och internationella åtaganden är inte tillräckliga för att hantera denna
Nytt om antibiotikaval mot urinvägsinfektion hos män
En ny registerstudie visar att det nästan alltid går lika bra att använda smalspektrumantibiotika mot UVI hos män.
28 okt 2025, kl 09:24
Annons
Apotekarsocieteten
Belöna de som gör läkemedelsinformation begriplig!
Nominera till priset för Bästa patientinformation 2025!
Senast 16 januari
behandlingsriktlinjer rekommenderar sedan
spektrumantibiotika som första val mot
rad urinvägsinfektion hos män. En ny
die från Centrum för
esistensforskning, Care, i Göteborg visar
skrivningsmönstret är på väg att förändras.
ver 45 procent av männen i studien
ntibiotika mot sin okomplicerade
on, år 2019 hade andelen som fick
ng minskat till drygt 30 procent.
digt att vården trots
n fortfarande i många fall väljer
som ökar risken för
Tinna Åhrén, forskare i infektionssjukdomar och regionläkare i Västra Götalandsregionen samt medicinsk rådgivare för Strama. Foto: Göteborgs universitet.
Vetenskapsradion Nyheter
rför kan din värktablett göra
ibiotikan verkningslös
Dela
augusti 2025 kl 05.37
medel som ibuprofen kan skapa antibiotikaresistens - det vill säga göra bakterier mer
mot antibiotika, visar en ny studie.
bakterier så att de lättare muterar, förändrar sin arvsmassa, vilket gör att
ern uppstå lättare.
Palme, som forskar kring antibiotikaresistens vid Chalmers Tekniska högskola berätta
a alternativet.
Miljöprofessor varnar för avloppsreningsdirektivet
Avloppsreningsdirektivet kan göra att vissa läkemedel slutar säljas i EU, varnar miljöprofessor Joakim Larsson.
maj 2025, kl 09:00
Läkemedel i miljön
miljövrav
Avloppsdirektivet
Annons
Apotekarsocieteten
Belöna de som gör läkemedelsinformation begriplig!
Nominera till priset för Bästa patientinformation 2025!
Senast 16 januari
et nya EU-direktivet om avloppsrening hotar
llgången till flera läkemedel i Europa, varnar både
ranschrepresentanter och forskare.
ostnaden för att minska läkemedelsrester i
vloppsvatten ska i huvudsak bäras av tillverkarna. Det
allas "polluter pays principle", alltså att föroreraren
etalar.
NYHETER
Poddavsnitt
Podd: GU samarbetar med Palestina antibiotikaforskning över gränserna
K103 Nyheter
2 april 2025
AI avslöjar spridning av resistens hos bakterier
Antibiotika
Bakterier
Artikel från forskning.se
Texten baserad på ett pressmeddelande. Läs mer om vårt
Bakterier delar gener

SCIENTIFIC MEETINGS

Annual meeting 2025

The CARe Annual Meeting was held in Gothenburg and brought together researchers, clinicians and policy experts to discuss current challenges and advances in antibiotic resistance research. The programme spanned the full AMR continuum, from evolution and transmission to novel therapeutics, diagnostics and clinical implementation.

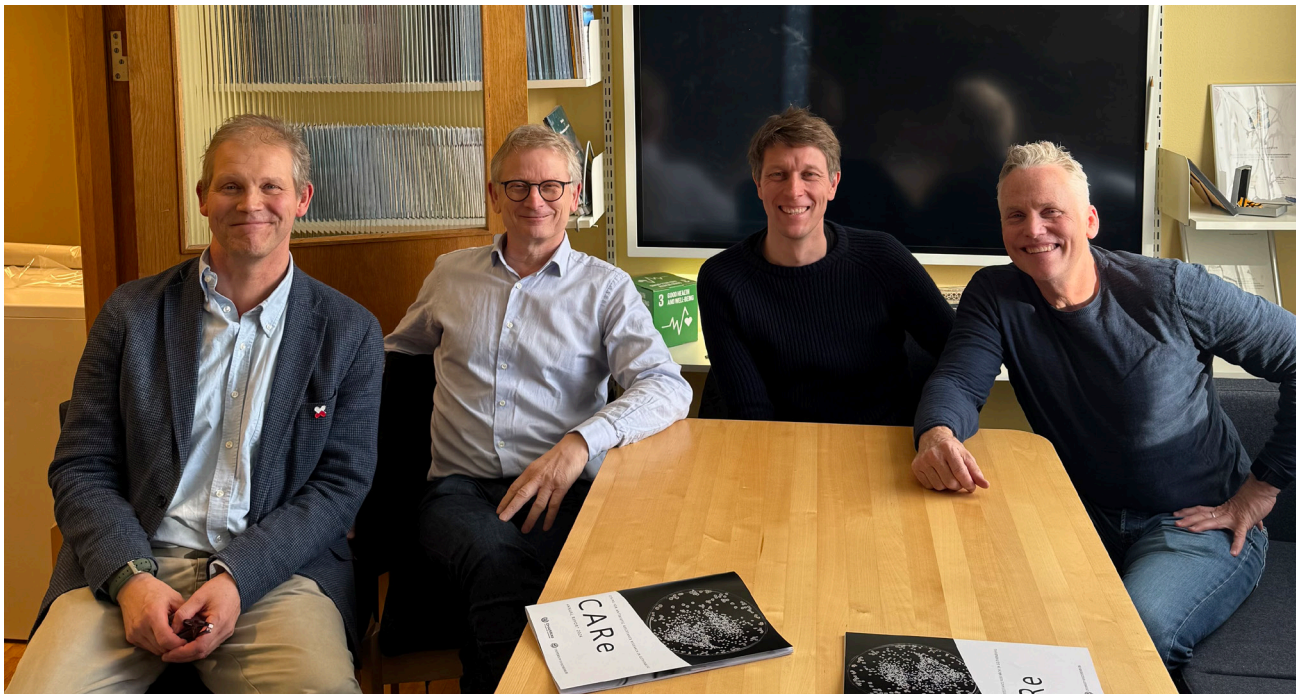
The meeting featured keynote lectures by Lance Price (George Washington University, USA), who addressed the evolution and transmission of antibiotic resistance, and Henrik Strahl (Newcastle University, UK), who presented new insights into lysis-independent bacterial killing by cell wall–targeting antibiotics. Together, the keynotes framed the meeting's focus on both fundamental mechanisms and translational solutions.

Scientific sessions highlighted key themes including environmental drivers of resistance and policy responses, exemplified by work on wastewater management, environmental surveillance and sewage monitoring. New methods and technologies were presented, ranging from ultrafast susceptibility testing and advanced imaging techniques to nanomaterials and bioinformatics support for data-driven AMR research.

The programme also showcased advances in new antimicrobial strategies, diagnostics and clinical AMR research, with presentations on novel antibiotics, resistance-breaking approaches, clinical outcomes of resistant infections and infection prevention in healthcare settings. Poster sessions and networking activities further strengthened interdisciplinary exchange and collaboration.

International visit

CARe hosted a visit from representatives of the International Centre for Antimicrobial Resistance Solutions, ICARS, providing an opportunity to discuss ongoing research and future collaboration in the area of antimicrobial resistance, this time with a focus on environmental dimensions and wastewater.



Joakim Larsson, Robert Leo Skov, Marc Stegger and Lance Price

Symposium on Therapeutics

The CARe Symposium on Antimicrobial Therapeutics: Drug Discovery, Design and Development was held at the University of Gothenburg and focused on advancing the discovery of new antimicrobial agents to address the growing challenge of antibiotic resistance. The symposium brought together leading international researchers from across chemistry, biology, pharmacology and clinical science.

Keynote lectures addressed critical bottlenecks and opportunities in antimicrobial drug development. Anna H. K. Hirsch (Helmholtz Institute for Pharmaceutical Research Saarland, Germany) highlighted the potential of underexplored drug targets to enable antibiotics with novel modes of action, while Stephan A. Sieber (Technical University of Munich, Germany) presented strategies for breaking bacterial resistance through chemical dysregulation. Further keynote contributions included Annelise E. Barron (Stanford University, USA) on biomimetic antimicrobial peptoids with broad-spectrum activity, Kim Lewis (Northeastern University, USA) on overcoming major obstacles in antibiotic discovery, and Paul J. Hergenrother (University of Illinois Urbana-Champaign, USA) on Gram-negative–active antibiotics designed to spare the gut microbiome.

The programme also addressed clinical perspectives and future development pathways, with presentations on the significance of antimicrobial drug development in healthcare and on challenges and opportunities in bringing next-generation antibiotics to the clinic. Rising Star sessions highlighted emerging researchers, while poster sessions fostered discussion and interdisciplinary exchange.

The symposium concluded with a panel discussion on “Innovation vs. Resistance: The Future of Antimicrobial Discovery”, emphasizing the need for sustained innovation, cross-disciplinary collaboration and long-term strategies to counteract resistance.


Background
DNA-damage
Intracellular processes
Cell wall

ORGANISATION

Management

Professor Joakim Larsson
Centre director, Institute of Biomedicine, University of Gothenburg

Associate professor Michaela Wenzel
Deputy centre director of CARe, Department for Life Sciences, Chalmers University of Technology

Lovisa Aijmer
Coordinator, Institute of Biomedicine, University of Gothenburg

Steering committee

Professor Erik Kristiansson
Chair of CARe steering committee, Department of Mathematics, Chalmers University of Technology

Professor Joakim Larsson
Centre director of CARe Institute of Biomedicine, University of Gothenburg

Associate professor Michaela Wenzel
Deputy centre director of CARe, Department for Life Sciences, Chalmers University of Technology

Associate professor Anne Farewell
Department of Chemistry and Molecular Biology, University of Gothenburg

Professor Martin Andersson
Department of Chemistry and Chemical Engineering, Chalmers University of Technology

Assistant professor Alesia Tietze
Department of Chemistry and Molecular Biology, University of Gothenburg

Birgitta Vallhagen
Head of administration, Institute of Biomedicine, University of Gothenburg

Researcher Björn Rönnerstrand
The SOM Institute, University of Gothenburg

Associate professor Carl-Fredrik Flach
Institute of Biomedicine, University of Gothenburg

Professor Christian Munthe
Department of Philosophy and Logics, University of Gothenburg

Professor Christina Åhrén
Strama network, Västra Götaland Region and the University of Gothenburg

Associate professor Elina Lampi
Department of Economics, University of Gothenburg

Professor Fredrik Westerlund
Department of Life Sciences, Chalmers University of Technology

Assistant professor Johan Bengtsson Palme
Department of Life Sciences, Chalmers university of Technology

Associate professor Margarita Trobos
Institute of Clinical Sciences, University of Gothenburg

Reference group

Dr Gunnar Kahlmeter
Former President of European Society of Clinical Microbiology, former director of EUCAST and other leadning roles in clinical microbiology

Dr Camilla Björn
Regional development strategist, Västra Götaland Region

Dr Leif Dotevall
Deputy Infection Control Physician, Västra Götaland Region

Susanne Tumlin
Head of Development, Gryaab

Dr Martin Johansson
Senior Director, Oticon Medical

Josefin Seth Caous
Project manager RISE

EXTERNAL GRANTS

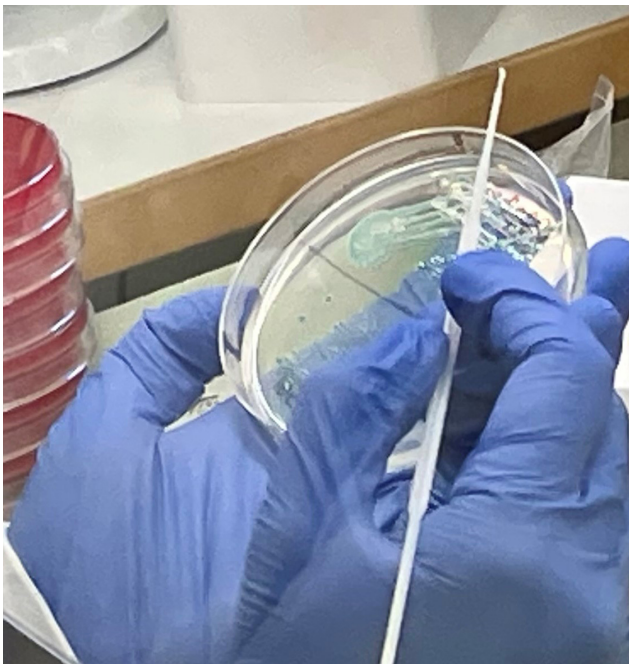
During the year, CARe researchers secured several competitive external research grants from national and European funding bodies. A selection:

Margarita Trobos is coordinator and principal applicant for the Marie Skłodowska-Curie Doctoral Network project SHIELD, funded under Horizon Europe. The project brings together twelve beneficiary institutions and fourteen partner organisations and focuses on strategies to prevent and treat implant-associated infections while extending the lifespan of medical devices. The total project budget amounts to approximately SEK 52 million and the project runs from 2025 to 2029.

Michaela Wenzel was awarded a Swedish Research Council network grant for planning future excellence clusters for groundbreaking technologies. The funded initiative aims to establish a national excellence cluster for AI-driven antibiotic innovation and supports strategic coordination and collaboration across institutions.

Erik Kristiansson received a Swedish Research Council Proof of Concept grant for a project focusing on the clinical evaluation of AI-driven decision support systems for the treatment of infections caused by antibiotic-resistant bacteria. Anna Johnning is co-applicant. The project supports the translation of research results towards clinical application.

In addition, CARe researchers are involved in the Vinnova-funded project DOUBLE BARRIER, which aims to integrate AI-driven multi-omics diagnostics with new infection prevention strategies to combat bacterial infections.



EDUCATION

In addition to teaching about aspects related to antibiotics and antibiotic resistance at numerous programs at undergraduate, master's and doctoral levels at the University of Gothenburg and Chalmers University of Technology.

At undergraduate level, Anne Farewell taught the course The Problem of Antibiotic Resistance, with contributions from researchers across CARe. The course addresses antibiotic resistance from a scientific and societal perspective and was completed by 161 students during the year.

Margarita Trobos coordinated and taught the PhD course Bacterial biofilms – microbiology and infection (3 credits) at the Institute of Clinical Sciences, University of Gothenburg. The course covered microbiological aspects of biofilm formation and its relevance for infection and antibiotic resistance and hosted students with highly different backgrounds.

DOCTORAL THESES

Doctoral theses defended in 2025:

David Lund
Data-driven insights on the dissemination of antibiotic resistance genes

Davide Fumagalli
Antimicrobial Resistance in the Environment: Ethical Considerations for Policy

Emil Burman
Genetic Contributions to Invasion and Biofilm Disruption in a Microbial Model Community

Marsel Ganeyev
From percutaneous to transcutaneous hearing implants: Surgical techniques, osseointegration and microbiological insights

Leonarda Achá Alarcón
Applied mass spectrometry-based proteomics in infectious diseases For biomarker identification and the study of antimicrobial resistance

Emil Burman (middle) celebrates a successful thesis defence

OUTREACH

During 2025, CARe researchers engaged in a range of outreach activities aimed at schools and the wider public.

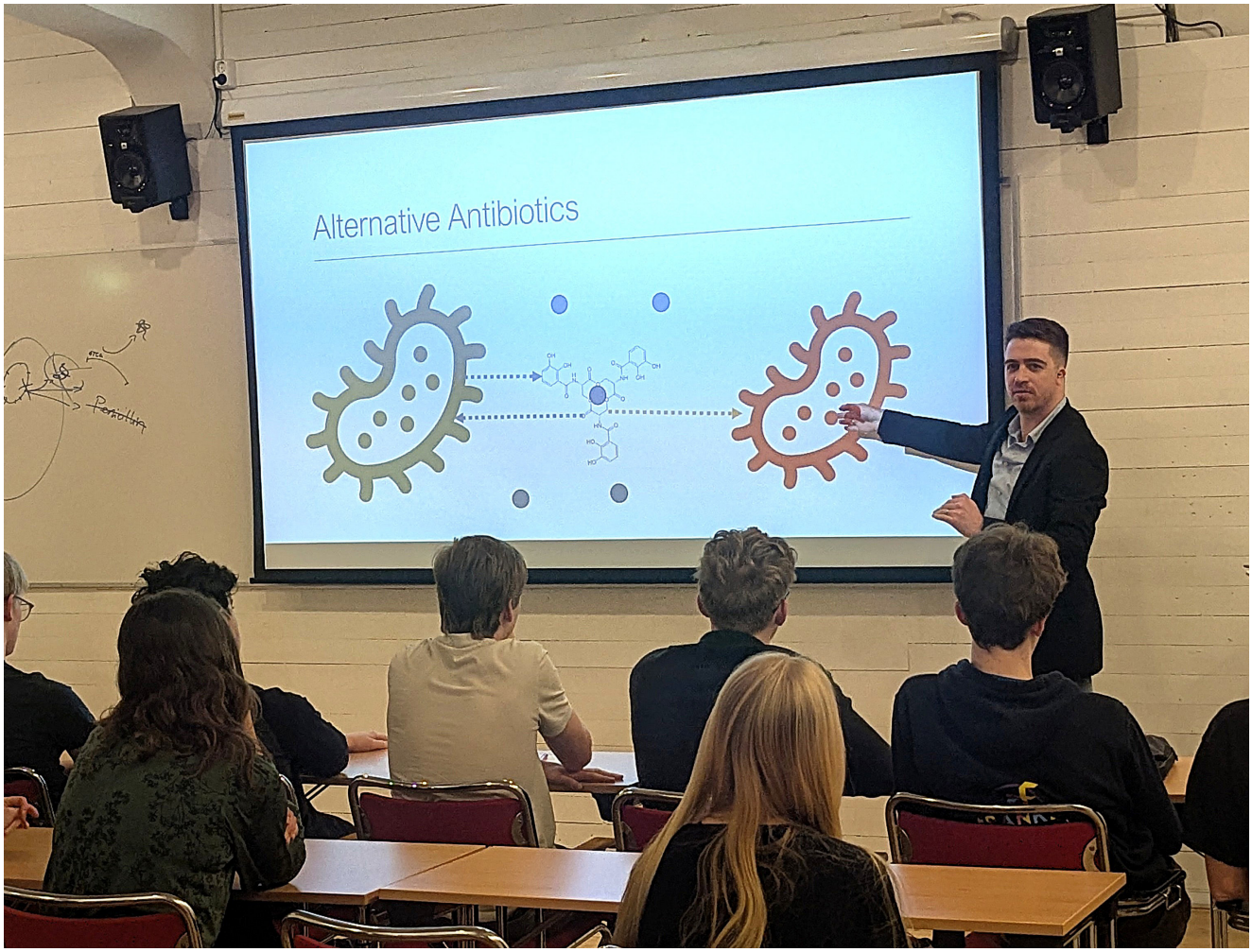
Michaela Wenzel hosted high school students from Hvitfeldtska Gymnasiet for a school project on the effects of antibiotic exposure on horizontal gene transfer and guided laboratory experiments on antibiotic resistance for students from Sigrid Rudebecks Gymnasium.

Margarita Trobos participated in a Career Day workshop at the International High School of the Gothenburg Region, where she presented career

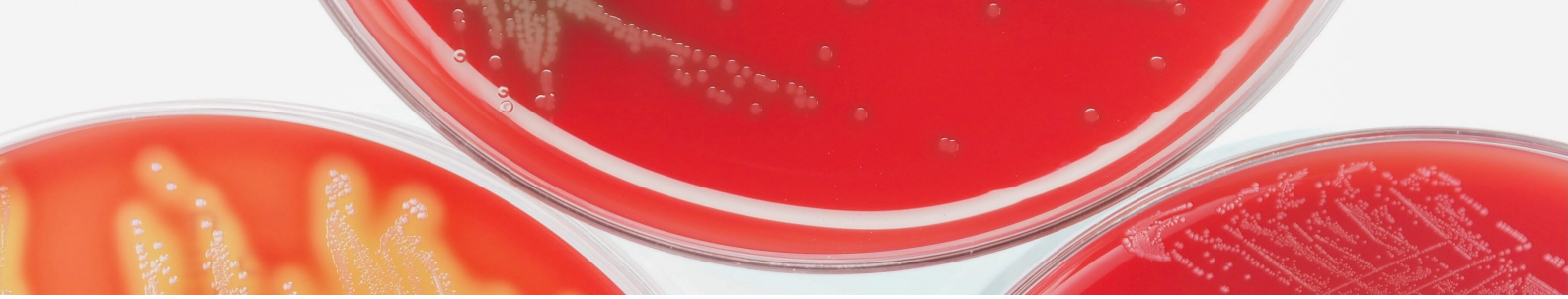
paths in medical research, while Roelof Coertze contributed to similar activities at Franklins Gymnasium.

Anna Johnning gave a presentation during the Polish Ambassador's visit to Chalmers, together with Astrid von Mentzer, highlighting research on identifying harmful bacteria using optical DNA mapping.

Johnning also contributed to the national initiative Forska Sverige! through a short video and written interview, as well as to the report Implementera mera! Agenda för hälsa och välstånd, published in 2025.



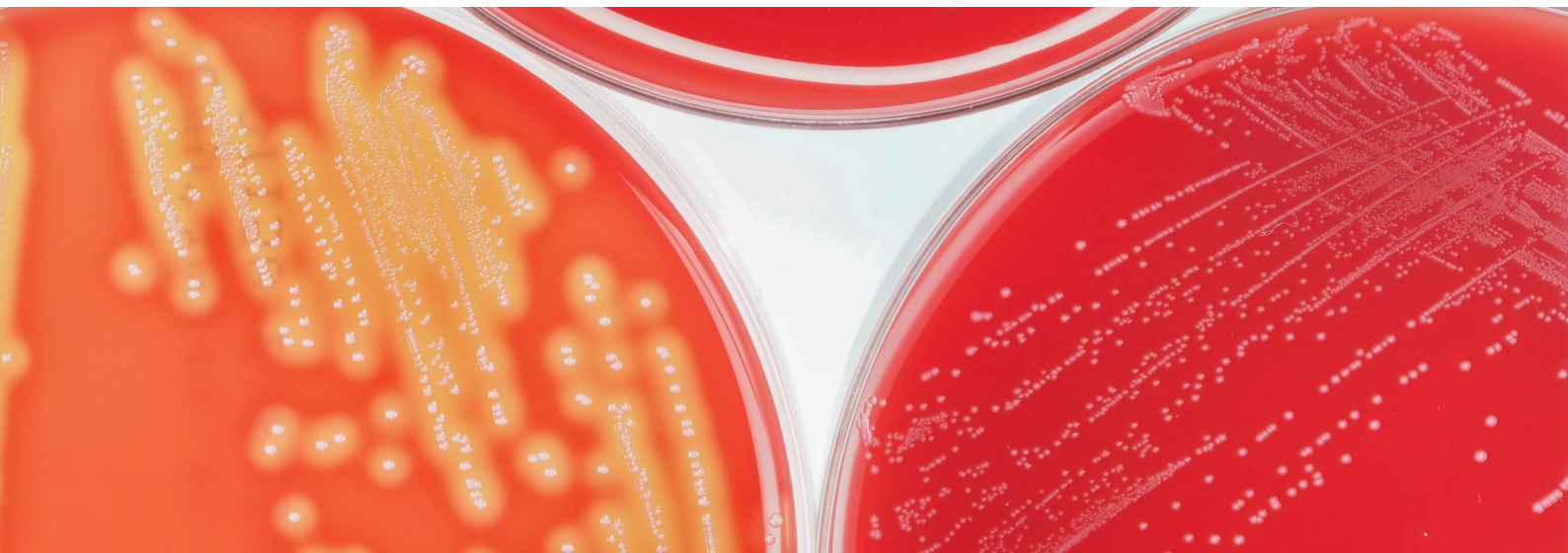
Roelof Coertzee gives a lecture at Franklins gymnasium



FINANCIAL STATEMENT

The following is a summary of income and expenditures in 2025. Note that this summary only covers administration, communication (internal and external), stakeholder interactions and related activities. The members are responsible for their own research budgets.

Total income 2025 (SEK)	**1 445 879**
- from Sahlgrenska University Hospital	240 000
- from Institute of Biomedicine, University of Gothenburg	387 493
- from Faculty of Science, University of Gothenburg	240 000
- from Chalmers University of Technology	300 000
- from Region Västra Götaland	278 386
Total expenditures 2025 (SEK)	**-1 163 778**
- personnel	-871 542
- running costs	-340 204
- out of which are travel costs	-108 115
- indirect costs (overhead)	-317064
Result 2025 (SEK)	**-191 046**



PUBLICATIONS

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