

Looking back and forward

GREETINGS FROM PROFESSOR SCHULZ
FOR CHRISTMAS 2023 AND THE NEW YEAR 2024

Reading again what I wrote in this newsletter at the end of the last three years, it seems that these have passed incredibly quickly: we are already approaching the end of the fifth year of the first RESIST funding period, with two more years to go. Our attention has therefore shifted onto the preparations for the RESIST renewal application, which we need to submit in August 2024: probably about a year from now we will be facing the external review panel that DFG will have put together.

was that RESIST has managed to create many close collaborations focused on clinical patient and volunteer cohorts at the heart of our research proposal and that, as a group, we have really come together very nicely and are now able to address questions that had previously been beyond our reach. We have also managed to include new colleagues and departments on the MHH campus in the infection and immunity research portfolio of MHH, such as in particular human genetics and structure as well as systems biology expertise.

Our new MSc course "Biomedical Data Analysis" has recruited its fourth intake in 2023, the first intake is working on their MSc projects and theses, and we have heard from several outside observers, such as for example the MHH advisory board ("Hochschulrat"), that they consider this new MSc course a very important and timely contribution of MHH to the emerging new world of large data. Many highly visible publications have so far emerged from our RESIST activities and altogether we can probably look back on the first five years with some degree of satisfaction. At the same time, much remains to be done and there are structural weaknesses that we have to overcome in order to convince the reviewers, in about one year from now, that our core concept for RESIST, to facilitate research into the causes of infection susceptibility and the pathogens of particular concern in susceptible patients, has developed well enough to merit another 7 years of funding.

The year 2024 will therefore be intense and keep all of us, but particularly the RESIST board, very busy. At the end of the fifth year of RESIST I would therefore like to thank all groups working in RESIST for their excellent contributions, their continued enthusiasm and generally having got us to where we stand today: it is you, the many RESIST scientists and clinicians, who have made all this possible. I wish you a Merry Christmas and a few relaxing days over the holidays. Furthermore, I wish all of us a very successful year 2024 and much enthusiasm, stamina and brilliant ideas for the coming, very intense, months.

Merry Christmas and a Happy New Year 2024!

Thomas Schulz



The RESIST speaker trio: Prof. Förster, Prof. Schulz and Prof. Hansen (from left).

Preparations for the renewal application started in April this year during our retreat at Burg Warberg, where we listened to progress reports from all RESIST-funded projects and discussed how to develop them further. Having solicited, in October this year, proposals from all RESIST-funded research groups for projects to be included in the second RESIST funding period, the RESIST board then discussed these and defined the outline of the RESIST renewal application during a recent short retreat in December 2023. The general impression during these discussions

RESIST 2.0

Meeting for the future

THE RESEARCH MANAGEMENT BOARD MET AT WENNIGSEN MONASTERY TO PLAN THE FURTHER DEVELOPMENT OF THE CLUSTER

The deadline is around eight months away: on August 22, 2024, the proposal for continued funding of RESIST for the period from 2026 must be submitted to the DFG. And it is important that the letter of intent is submitted to the DFG as early as January 29, 2024.

In order to plan the future research priorities and the structure of the cluster's research areas, including the cohorts and technologies, the members of the RESIST Research Management Board met for a retreat at Wennigsen Monastery on December 7 and 8. Prof. Dölken, who will take over the management of the Institute of Virology at the MHH from Prof. Schulz in April 2024, Prof. Penninger, Scientific Director of the HZI Braunschweig, the RESIST members Prof. Schlüter, Prof. Di Donato and Prof. Slevogt as well as Dr. Faber and Dr. Gripp from the RESIST management were present.

After Prof. Schulz had welcomed all those present, he and Prof. Grimbacher, Prof. Förster and Prof. Slevogt, standing in for Prof. Häußler, presented the previous work, successes and experiences of the four RESIST research areas A to D, as well as the previously developed concepts for future research content and structures. The 20 or so retreat participants discussed and evaluated the proposed concepts and also included the overarching research program and the topic of artificial intelligence in their deliberations over the course of the rest of the day. They also addressed the question of how the data generated as part of RESIST can be integrated into databases in order to bring it together with all the knowledge that already exists. A cozy end to these discussions in the fireplace room of the monastery rounded off the first day.

On the second day, Prof. Dölken presented his initiative for a new "Center of Excellence for Virus Immunology and Immunotherapy" (CEVIIT), which is to be submitted to the European Commission as part of a funding application, and Prof. Penninger presented his plans for an organoid robotics platform at the HZI.

In the discussions that followed, the topics of future research priorities and the structure of the Cluster of Excellence were discussed further, including the continuation and expansion of the cohorts, the admission of further researchers, the appointment of the trio of speakers and new collaborations.

Those present planned the next steps and appointed the members of the committee who will be involved in writing the letter of intent and the follow-up application. Dates for the coming year were also discussed: the review by the Scientific Commission of Lower Saxony on January 15, the meeting with the external Scientific Advisory Board of RESIST on February 26 and 27, and the symposium to be held jointly with the Clusters of Excellence "Controlling Microbes to Fight Infections" (CMFI), Tübingen, and Balance of the Microverse, Jena, on October 1 and 2, 2024 at Futurium Berlin.

The participants of the RESIST retreat.



A warm welcome

WE WELCOME PROF. DI DONATO AND PD DR. SABINE PIRR

Which genetic mechanisms underlie immunodeficiencies and thus susceptibility to infections? Prof. [Dr. Nataliya Di Donato](#) is participating in RESIST project area A with her research on this question. "Some syndromes caused by immunodeficiencies are found in less than 500 out of a million people, making it even more difficult to find the disease-causing mutations. Therefore, we are working closely together in interdisciplinary teams with clinicians and researchers and use the latest methods to find the right diagnosis for our patients to enable customized, effective treatments," says Prof. Di Donato.

Prof. Di Donato has headed the Department of Human Genetics, MHH, since May 2023. She studied at the Medical University of Charkiw, Ukraine, and received her doctorate from the Medical Faculty of the University of Zurich, Switzerland, in 2007. In 2014, she went to the Seattle Children's Research Institute in the USA for a year as part of a DFG research fellowship. Most recently, she was a group leader at the Institute for Clinical Genetics at the University Hospital Dresden.

Why are newborns and especially premature babies so susceptible to serious infections compared to older children or adults? [PD Dr. Sabine Pirr](#) is investigating this question. She is focusing in particular on the role of breast milk in the development of the immune system and the microbiome of premature babies. "I am particularly interested in the cellular composition of breast milk with the changes that occur during breastfeeding and the mechanisms of transmission and consecutive neonatal infections with the human cytomegalovirus," she says. PD Dr. Pirr is a researcher and works as a senior physician in the field of neonatology at the Clinic for Pediatric Pneumology, Allergology and Neonatology at MHH.



Prof. Di Donato



PD Dr. Sabine Pirr

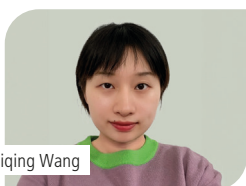
New RESIST employees



Jan Eberhage



Dr. Anja Meyer



Ziqing Wang



Dr. Yuan Zhuang

[Jan Eberhage](#), PhD student in the team of PD Dr. Eschenburg, MHH Institute of Biophysical Chemistry.

[Dr. Anja Meyer](#), Postdoctoral researcher in the team of Prof. Prinz, Institute of Systems Immunology, University Medical Center Hamburg-Eppendorf.

[Ziqing Wang](#), PhD student in the team of Prof. Ravens, MHH-Institute of Immunology.

[Dr. Yuan Zhuang](#), Postdoctoral researcher in the team of Prof. Schlüter, MHH-Institute of Medical Microbiology and Hospital Hygiene.

Welcome to the team

On our RESIST homepage, we now explicitly welcome all researchers who come to Hannover from abroad. On several pages, professors and (post-) doctoral students can find information about their stay here. They will find practical tips and a wealth of information on preparing for and following up on their stay as well as for their time in Germany. You can access the new pages via the following link: www.resist-cluster.de/willkommen-im-team/.



How harmless turns dangerous

CAUSES OF BLOODSTREAM INFECTIONS FOUND IN BACTERIAL GENES



Judit Burgaya and Prof. Galardini in the TWINCORE.

Escherichia coli bacteria live in the intestines of humans and play an important role there for normal intestinal function as well as for a functioning immune system. These intestinal inhabitants do not form a uniform population, but consist of a large number of strains that differ greatly in their genomes and also in their metabolism. Most strains of *E. coli* are harmless, but some can cause diarrhea or urinary tract infections and – if they enter the blood – bloodstream infections and sepsis via their toxins. Sepsis is the third most common cause of death in Germany.

The RESIST research group "Systems Biology of Microbial Communities" led by Prof. Galardini at the Institute of Molecular Bacteriology at TWINCORE has found that *E. coli* has a significant genetic variation that contributes to the transition between harmless life in the intestine (commensalism) and the pathogenic form. In addition, the researchers were also able to show that this bacterial species has evolved over the years to cause more disease. "Building on these findings, we envision the creation of better molecular diagnostic tools in the future, and these results might also be important for vaccine development," says Prof. Galardini. **The team published their findings in the journal *PLoS Genetics*.** First authors are Judit Burgaya and Julie Marin. The work originated in collaboration with Prof. Denamur (INSERM, Paris) and Prof. Blanquart (Collège de France).

The team examined a collection of about 900 *E. coli* isolates that cau-

sed blood infections and 370 harmless isolates. The samples were collected by Prof. Denamur's team at INSERM over a period of 17 years (from 2000 to 2017) and were collected at various times in hospitals in northern France. "We found significant differences between disease-causing and harmless isolates – both in their pangenomes, i.e. the totality of genes of the respective isolates, and in their genetic backgrounds, in terms of the presence of virulence-associated genes and antimicrobial resistance genes," says Prof. Galardini. Using another commensal collection from 1980, the group also found that pathogenicity might have increased steadily from 1980 through 2000 to 2010.

This work is the third in a series of studies aimed at understanding the genetic determinants of the ability of *E. coli* to cause bloodstream infections. The team published the first two papers in **2020** and **2022** in the journal *PLoS Genetics*.

KSHV inhibitors developed further

Herpes viruses usually remain in the body permanently: they hide in cells and also succeed in being transferred from the mother cell to the daughter cells during cell division. In the case of Kaposi's sarcoma herpesvirus (KSHV), a specific viral protein called LANA is essential for the process of passing it on to the daughter cells. It binds the DNA of the virus to the chromosomes of the host cell, which are then divided and enter the daughter cells.

A team of scientists, in which many RESIST researchers are involved, has now succeeded in further developing substances that prevent LANA from binding to the virus DNA. "These inhibitors were able to be refined and now stop these herpes viruses from

surviving in the human body," says Aylin Berwanger from Dr. Empting's research group, HIPS and DZIF. She is the first author of the paper published on this result in the renowned ***Journal of Medicinal Chemistry***. "The work was based on LANA inhibitors that we had previously developed," explains Dr. Stein from Prof. Schulz's team. The scientists came to these results together with other researchers, including Prof. Hirsch from HIPS.

KSHV causes Kaposi's sarcoma, a rare cancer of the skin, mucous membranes and internal organs, and is also responsible for two rare lymphomas. The diseases usually only develop when the immune system is weakened, such as in AIDS or during immuno-



Aylin Berwanger and Dr. Stein (from left) presented their work at the DZIF annual meeting at Herrenhausen Palace.

suppressive therapy, but also occur in old age and after a transplant. The course of the disease can vary greatly; it may only cause tissue changes or it can lead to death.



Prof. Müller receives the Charles Thom Award.

Charles Thom Award for Prof. Müller

Prof. Müller received the prestigious Charles Thom Award from the Society for Industrial Microbiology and Biotechnology (SIMB) for his exceptional contributions to the scientific community. The award recognizes his remarkable scientific achievements and emphasizes the importance of his original research to the advancement of industrial microbiology and biotechnology. Prof. Müller is the founding and Scientific Director of the Helmholtz Institute for Pharmaceutical Research Saarland (HIPS) and Professor of Pharmaceutical Biotechnology at Saarland University. The award ceremony took place during the annual meeting of the SIMB in Minneapolis, USA, at the end of July / beginning of August.



Schematic representation of the data analysis

Help with data analysis

RESIST research teams who are generating large volumes of data now can get help analyzing these complex biomedical data. That's because Hanan Begali recently joined the RESIST team as a bioinformatician, where she is mentored by Prof. Depledge, Prof. Lauber and Prof. Galardini in the RESIST Biomedical Data Analysis Group (BDAG).

Hanan Begali's current projects include analyzing data sets generated by high-throughput sequencing and mass spectrometry. She will also analyze image data using certain artificial intelligence techniques, such as machine learning and deep learning approaches. She will further handle the development and maintenance of bioinformatics workflows, discuss data analysis requirements with RESIST teams, and support introductory bioinformatics courses for non-computer scientists.

Hanan Begali's PhD thesis focused on the study of chronic hepatitis B virus infection using knowledge graphs. It took place within the MHH PhD program "BIOMedical DATA Science" (BIOMEDAS) and is expected to be completed soon. Previously, she obtained a Master's degree in Life Science Informatics at Bonn University and a Bachelor's degree in Microbiology at King Abdul-Aziz University in Saudi Arabia. RESIST teams in need of data support should contact Prof. Depledge, Prof. Galardini, or Prof. Lauber for further information.

RESIST researchers highly regarded

RESIST members Prof. Li, Prof. McHardy and Prof. Werfel are among the most cited scientists in the world. This was the result of the latest analysis of scientific publications by Clarivate Analytics. The annual list of "Highly Cited Researchers" shows which publications in each discipline are among the one percent that have been cited the most in the past ten years.



Prof. Li



Prof. McHardy

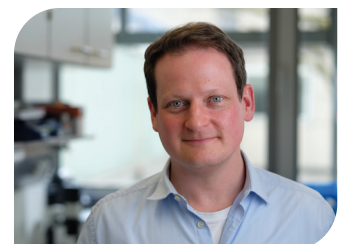


Prof. Werfel

Prof. Li, Prof. McHardy and Prof. Werfel are listed in the "Cross-Field" category, which includes researchers who have an influence on science beyond their actual field of work. The entire list of "Highly Cited Researchers 2023" and further information can be found on the Web of Science website at www.clarivate.com.

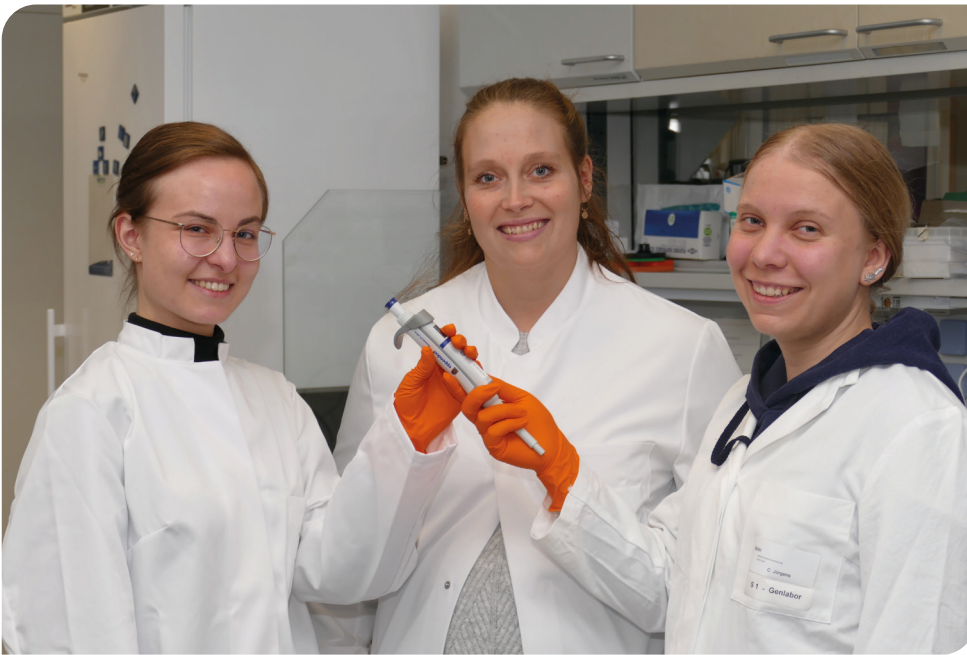
Publication award for Dr. Rösner

Dr. Lennart Rösner received the Atopic Dermatitis Prize 2023 in the publication award category during the annual meeting of the German Society of Dermatology (DDG) in Berlin in April 2023. The prize, endowed with 15,000 euros, recognizes his research on the topic of „T-cell receptor sequencing specifies psoriasis as a systemic and atopic dermatitis as a skin-focused, allergen-driven disease“.



Dr. Rösner

RESIST helps to reconcile careers and children



Mara Lissek,
Dr. Anika Freise and
Dr. Carina Jacobsen
(from left).

Dr. Eirini Nikolouli
with her child.



Pursuing a scientific career at the same time as being pregnant and looking after children – that is very difficult. Female postdocs working in RESIST or associated with RESIST can get support by applying for co-financing of a technical assistant for up to twelve months. Dr. Anika Freise, Dr. Carina Jacobsen and Dr. Eirini Nikolouli were successful: they will now be relieved during their parental leave or their subsequent return to work from January 2024.

Dr. Freise is currently expecting her first child, who is expected to be born in February 2024. "It is very important for me to be supported by a technical assistant during my parental leave so that I can continue my research, publish the results and

then apply for a research grant," she says. She works in the team of PD Dr. Benjamin Heidrich, MHH Clinic for Gastroenterology, Hepatology, Infectiology and Endocrinology, who heads the RESIST project B11 on bile duct inflammation, among other things.

Dr. Jacobsen, who works in the same clinic, is also expecting the birth of her first child, probably in April. "I am very happy that I can continue my scientific work during my absence by supervising a technical assistant," says the postdoctoral researcher. She already knows that technical assistant Mara Lissek will be taking on this task and is very happy about it. Dr. Jacobsen is part of Dr. Helenie Kefalakes' team researching diseases that arise due to the immune system's reaction to a hepatitis D virus infection. This research is part of the RESIST project B14.

Dr. Nikolouli is currently on parental leave and will continue her research activities from June 2024 in the team of Prof. Lachmann, MHH Clinic for Pediatric Pneumology, Allergology and Neonatology. During her parental leave and at the beginning of her return period, she will also be supported by a technical assistant. The researcher works in the field of innate immune cells and the factors that support immune cells, such as macrophages, in their response to bacteria and viruses. "The support will allow me to quickly carry out the necessary experiments to publish my data and apply for further research grants soon after I return from parental leave to expand my scientific career," she says.

Herpesvirus Workshop

More than 100 enthusiastic herpesvirus researchers from 33 institutions and six countries participated at the 16th Mini Herpesvirus Workshop, held for the first time at the MHH on September 29, 2023. This annual meeting was organized by Prof. Depledge and Prof. Viejo-Borbolla.

The scientific program, centered around virus-host interactions, gene expression and replication, latency and pathogenesis, included presentations from 35 participants – many of them young researchers. In addition, Dr. Hannah Burgess from the University of Surrey, UK, and Dr. Jia Zhu, Fred Hutch Cancer Centre & University of Washington, USA, each gave a plenary talk and then spent considerable time interacting with other participants. Together with the poster presentations and associated introductory talks, a broad spectrum of herpesvirus biology was represented. A social evening at TWINCORE rounded off this workshop.

"Overall, the meeting was a great success and we were able to gain valuable experience and network. Several new collaborations have originated from this meeting and I was pleased to see that the work presented by the many MHH herpesvirus labs was well received," said Prof. Depledge. "I really enjoyed the scientific presentations and discussions and the opportunity to meet again with known colleagues, and to get to know new ones. This workshop was a clear indication that the research on herpesviruses is very much alive in Germany and elsewhere", adds Prof. Viejo-Borbolla. "We would like to thank the sponsors, including the Research Unit DEEP-DV and RESIST for their support. A special thank you is also owed to the many PhD students, postdocs, and research technicians who volunteered their time to make the conference run smoothly."



Prof. Viejo-Borbolla, Dr. Zhu, Dr. Burgess and Prof. Depledge (from left to right).



Prof. Wedemeyer, Dr. Kefalakes and Prof. Schulz (from left) are delighted with the numerous guests.

The second satellite symposium

The RESIST Satellite Symposium 2023 took place on October 5 at the Courtyard Hotel am Maschsee – as part of the international conference "Delta-Cure". This conference on hepatitis D virus infections was organized by the MHH Clinic for Gastroenterology, Hepatology, Infectiology and Endocrinology under the direction of Prof. Wedemeyer.

The satellite symposium was organized by researchers from RESIST and the D-Solve consortium. Prof. Schulz and Dr. Kefalakes welcomed the numerous guests and guided them through the program, which consisted of seven lectures and two short presentations.

Prof. Urban, University of Heidelberg, kicked things off with a presentation of the latest findings in the field of hepatitis D virology. This was followed by Prof. Björkström from the Swedish Karolinska Institutet with a presentation on the increase in the antiviral effectiveness of natural killer cells. Prof. Cornberg, MHH, then answered the question of how anti-hepatitis B virus immunity can achieve elimination of the hepatitis D virus. Prof. Kalinke, TWINCORE, continued and spoke about the possibility that B cells can predict the future and Dr. Lupberger, INSERM, France, reported on epigenetic approaches to inhibit hepatocellular carcinoma induced by hepatitis D viruses.

Finally, Dr. Sandmann, MHH, gave a talk on the multi-omics approach to deciphering hepatitis D virus control and Dr. Carpentier, TWINCORE, presented his topic revolving around the analysis of HDV-infected stem cell-derived hepatocytes. "I am delighted that the RESIST Satellite Symposium could be part of the Delta-Cure conference, which brought together the global community around hepatitis D treatment and research. Hannover plays a decisive role in clinical studies in this area and research on this topic is also developing here with great potential – also in RESIST," says Prof. Schulz. "The satellite symposium was a complete success! It showed once again how important translational research approaches are in order to gain new insights for the clinic," adds Dr. Kefalakes.

RESIST supports LISA

Students from around 20 countries took part in the "Lower Saxony International Summer Academy in Infection and Immunology (LISA)" this summer. It took place from August 27 to September 15, 2023 at TWINCORE and was aimed at young students of biosciences and medicine (Bachelor / Master) who are aiming for a doctorate in immunology or infection research.

The program included lectures in which lecturers presented their scientific work and participation in practical demonstrations and laboratory rotations. The summer academy took place for the twelfth time and was significantly supported by RESIST this year. The content of LISA was also adapted in line with the focus topics of the Cluster of Excellence and included current topics in immunological and infectiological research as well as introductions to innovative experimental techniques. It covered basic science and translational aspects as well as new therapeutic approaches.



Holding the LISA symbol: Prof. Förster, Andrea von Craushaar, Dr. Susanne Kruse and Prof. Kalinke (from left) as well as some students.

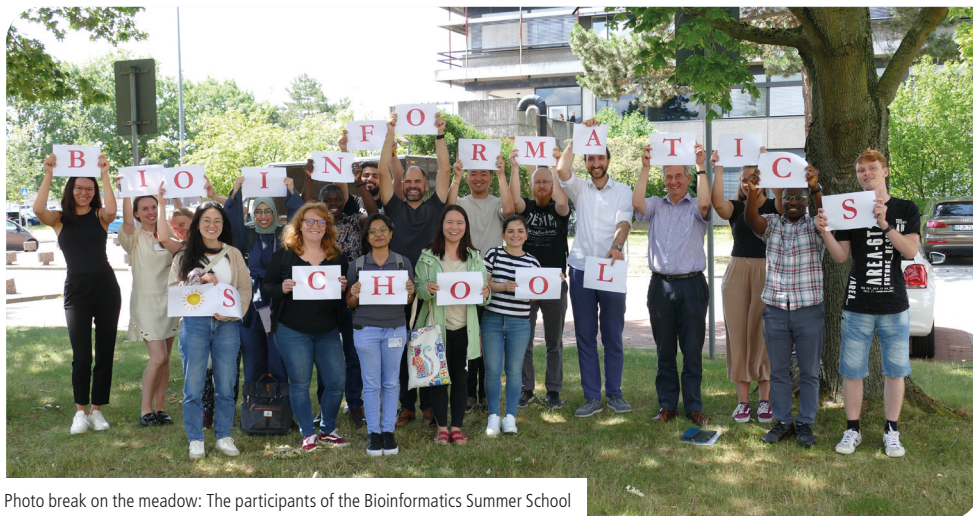


Photo break on the meadow: The participants of the Bioinformatics Summer School

R and "Leine"

A RESIST BIOINFORMATICS SUMMER SCHOOL TOOK PLACE FOR THE FIRST TIME

Bioinformatics is fascinating: it makes it possible to use computer-aided methods to gain insights into biology and medicine – for example, to decode the human genome. To learn more about bioinformatics methods and working methods, 17 (post-)doctoral students and research group leaders took part in the first RESIST "Bioinformatics Summer School". The aim was to learn how to analyze bulk and single-cell transcriptomics using the programming language R and the MHH High Performance Computing Cluster "Leine". It took place from July 17 to 21 at the MHH and was funded by RESIST. The course was led by Prof. Dr. Thomas Otto from the University of Glasgow, who specializes in computer-aided method development in the field of immunology and infection.

The participants were able to learn how to generate and analyze RNA sequencing (RNA-Seq) data sets, including both mass RNA-Seq and single cell RNA-Seq data sets. RNA sequencing, i.e. the determination of the nucleotide sequence of ribonucleic acids and their abundance, is an important technology for researching cells and diseases. It opens up the possibility of carrying out comparative studies – for example between virus-infected and non-infected cells.

The program of the Bioinformatics Summer School ranged from a theoretical and practical introduction to the programming language R to exercises on sequencing the transcriptome – analyzing which genes are switched on and thus converted into mRNA – and vari-

ous programs, for example Seurat for the analysis of single-cell data sets. "The aim of the course was to teach the participants the basics and the "bioinformatics language" so that they can now carry out their analyses independently and, if necessary, seek help on the Internet on their own.

The course was organized by Prof. Depledge who also gave two one-day courses on "Introduction to High Performance Computing" as a prerequisite for participation in the summer school. His course covered high-performance computing (HPC) topics ranging from basic commands for the Unix operating system to writing scripts to process and analyze RNA sequencing data. Prof. Depledge was assisted by Amy Fitzpatrick, a visiting scientist in his lab.

Dr. Carina Jacobsen enjoyed the Bioinformatics Summer School: "It gave a good insight into the use of bioinformatics methods and the bioinformatics way of working. We got a heads-up on how complicated it can be in terms of the administrative side of working on the HPC. This will enable us to better assess planned experiments in the future. The course also contributed to the networking of colleagues working in bioinformatics," says the postdoctoral researcher from the MHH Clinic for Gastroenterology, Hepatology, Infectiology and Endocrinology.

Her colleague Dr. Anika Freise is also enthusiastic: "Prof. Otto managed to give a very informative and high-quality course despite some problems with the local infrastructure! Analyzing RNA sequencing data will definitely be easier and faster for me now."



In Hamburg: RESIST guests and the hosts of the CSSB

RESIST on a journey

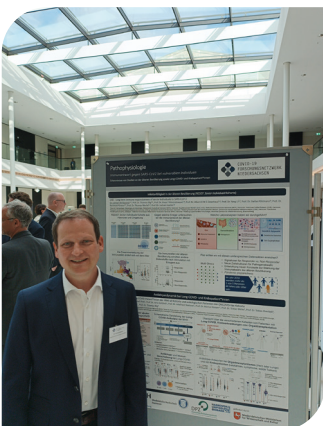
RESIST MEMBERS WERE GUESTS AT
THE CENTER FOR STRUCTURAL SYSTEMS
BIOLOGY (CSSB)

The team at the Center for Structural Systems Biology (CSSB) gave a warm welcome to the seven RESIST members who visited Hamburg on August 29. First, the guests received general information about the center from Prof. Grünewald, the scientific director of the CSSB, who is also a RESIST researcher himself. The research of the 18 CSSB working groups (of which five are associated) and the four central facilities was then presented to them in an interesting and clear manner by the respective team leaders in short presentations. Prof. Blanche Schwappach-Pignataro, Chair of the CSSB Board of Trustees and Dean of the Faculty of Medicine at the University Medical Center Hamburg-Eppendorf, then presented the new Cluster of Excellence initiative "Gateways to Health". This focuses on interdisciplinary approaches to preventing or combating pathogens that have an impact on global life.

Prof. Schulz continued the program with a presentation of the RESIST Cluster of Excellence. He emphasized that RESIST brings together the northern German institutions MHH, TWINCORE, TiHo, HZI, CSSB and the University of Lübeck. "RESIST has also created the basis for a better connection between the MHH, the CSSB and the University of Lübeck. Building on this, the new joint research training group "VISualization and imaging of virus InfectiON (VISION)" was established, which focuses on dynamic imaging and structural virology," he said. The RESIST spokesperson also reported on the "Hanover-Glasgow Infection Strategy" (HAGIS) project and explained that the new MHH professorship at the CSSB, which was recently approved for financial support by the state of Lower Saxony, will deepen the relationship between the MHH and the CSSB. Further joint projects are also being planned.

A tour of the laboratory of RESIST Professor Bosse, whose "Quantitative Virology" working group is based at the CSSB, and of one of the cryo-electron microscopes rounded off the visit. "We are delighted with the visit and look forward to strengthening the exchange with our colleagues from RESIST, exploring future joint projects and welcoming another MHH group to the CSSB in the medium term," said Prof. Grünewald.

MHH researchers in particular have the opportunity to use the four central CSSB core facilities for their own scientific work and to take part in the training courses in advance. Prof. Bosse's group is happy to receive guests from the MHH at the CSSB. If you are interested, please contact Prof. Dr. Jens Bosse, e-mail: jens.bosse@cssb-hamburg.de.



Dr. Rösner

RESIST in the state parliament

How does the immune system of older people react to a SARS-CoV-2 infection in the long term? This question is the focus of the LISE project, which is based on data from the RESIST Senior Individuals Cohort. On November 8, 2023, Dr. Lennart Rösner had the opportunity to present LISE and the RESIST cohort at a poster presentation in the Lower Saxony State Parliament and to introduce this research to inter-

ested members of parliament, including the Lower Saxony Minister for Science and Culture Falko Mohrs. The poster was designed together with Prof. Falk, who focused on the risk group of organ transplant patients.

In LISE, the RESIST researchers Prof. Hühn, Prof. Werfel, Prof. Förster, Prof. Li, Prof. Illig and Dr. Rösner work together with other partners

from research institutions in Lower Saxony. The entire poster presentation, entitled "Tackling pandemics as a medical and social challenge", provided insights into the interdisciplinary work of the COVID-19 Research Network of Lower Saxony (COFONI), which has been funding the LISE project since 2022.

First ceremonial Master's graduation

The first graduates of the Master's degree course in Biomedical Data Science will be able to receive their certificates at the MHH on February 9, 2024 from 5 p.m. – at the joint graduation ceremony for the Master's degree courses in Biochemistry, Biomedicine and Biomedical Data Science. At this event, the best modules, as chosen by the students, will also be awarded teaching prizes. Prof. Jesko Köhnke, Managing Director of the Institute of Food Chemistry at Leibniz Universität Hannover, will give the keynote speech.

In addition, the "Gesellschaft der Freunde der Medizinischen Hochschule Hannover e.V." and the Junior-GBM of the "Gesellschaft für Biochemie und Molekularbiologie e.V." will award study prizes to the graduates for the best degree and the best Master's thesis.

Further information on the graduation ceremony can be found on the homepage of the Master's program under the following link: www.mhh.de/master-biomeddat.

RESIST seminar series 2024



The lectures of the RESIST seminar series will continue to take place in 2024 on the first and third Thursday of every month from 5 to 6 p.m. in Lecture Hall Q, Building J6 of the MHH. As part of this lecture series, RESIST researchers and guest speakers will present their current research work, research results or new project ideas. Doctoral students and postdocs can also take part and present their topics and research areas. Please contact us by e-mail: RESIST@mh-hannover.de.

Exceptions prove the rule: The guest lecture by Prof. Dr. Andreas Keller, Clinical Bioinformatics at the Helmholtz Institute for Pharmaceutical Research Saarland (HIPS), will take place on a Wednesday: January 17 at 3:15 pm. On February 1, Prof. Redmond Smyth from the Genome Architecture and Evolution of RNA Viruses research group at the Helmholtz Institute for RNA-based Infection Research (HIRI), will then give a lecture. On February 15, RESIST researcher Prof. Michele Proietti will give a lecture. The other dates and the lecture topics can be found on the RESIST homepage at www.RESIST-cluster.de and on the RESIST intranet. We look forward to a lively participation. It is also possible to participate online.



Dr. Melina
Celik and
Anna Selich
(from left)

Dr. Melina Celik, coordinator of the Master's programme Biomedical Data Analysis, which was launched as part of RESIST, will have a baby in February 2024. In order to be able to devote herself full-time to this wonderful and intensive new task, she is entrusting her

Master's program: Temporary change

duties temporarily – currently planned for around a year – to biomedical scientist Anna Selich. "I have already worked in coordination and organization and am now happy to dedicate myself to coordinating this degree course," she says. Her tasks now include advising and supporting the students as well as organizing the course and the admission procedure. She will also organize information events, take on the public relations work for the course and manage the budget. Contact: Anna Selich, e-mail: master.biomeddat@mh-hannover.de, telephone: (0511) 532-5700.

Summer network meeting

The 50 or so guests who came to this year's summer RESIST network meeting, which took place on August 25 in and around TWINCORE, were lucky with the weather. Just before it started in the afternoon, the sun replaced the rain and shone until the evening.

This meant that RESIST co-spokesperson Prof. Förster was able to welcome everyone to the terrace and lawn, after which everyone was able to enjoy a delicious bar-



With guests: Prof. Förster during his welcoming speech

becue buffet and relaxed conversation. The RESIST members exchanged ideas, made new contacts and deepened existing ones, while the children they had brought along were well integrated into a fun program by two costumed entertainers: They were able to play, blow bubbles, have their faces painted and snack on candy floss. Finally, the winners of the now traditional RESIST bingo game received their prizes in the form of delicious coffee and tea. They had successfully answered the questions – for example, they had found someone who has a really crazy hobby, knows an inspiring quote or has an unusual talent.

The summer party will certainly take place again next year – shortly after the application for the continuation of the Cluster of Excellence has been submitted to the DFG. We are already looking forward to the joint celebration, hopefully again with many guests.

At the MHH Open Day



Guests on the guided tour of the MHH central laboratory.

Around 2,500 guests came to the MHH Open Day on November 11. There was an exciting and varied program from the clinic, research, teaching and training at 50 stands.

RESIST was also there – in three different ways: guests were able to rub their hands with a special disinfectant that fluoresces under black light to test how well they had removed possible pathogens. There was also a quiz with prizes and the opportunity to be guided through the MHH central laboratory by Dr. Neumann. Maylin, for example, was very enthusiastic about this: "The whole tour was clear and engaging. I found the automation and the microscopic images of the urine and blood samples super exciting."

Virtual reality: herpes viruses make it big!

When kissing, cold sores viruses can be transmitted if one of the two kissers is carrying them and blisters have just formed on their lip. But what happens in the body then? Where do the viruses go, what happens to their capsids, which cell components play a role and how does the virus get the opportunity to multiply? Our new video shows this process in a very exciting, detailed and vivid way in three-dimensional quality. It can be viewed with virtual reality glasses and is both fascinating and educational.

Anyone who would like to try it out can do so at the RESIST Christmas party on Thursday, December 14 from 6 p.m. in front of lecture hall Q in MHH building J6. It will take place after the last RESIST seminar of the year. Otherwise, the VR glasses will go on tour and inspire interested people at the IdeenExpo next year, for example.



Imprint

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The answers to the questions in the
"Stammtisch" article are:
Cuba; Iran, Afghanistan, China and India;
fruit flies

RESIST at school



In the classroom: Pupils examine a sample of SARS-CoV-2 viruses.

What infectious agents are there? How big are they? How are they transmitted from person to person? The first "lab" on the topic of infection biology, which came to a school with the LeibnizLAB, started with very clear and exciting experiments on these questions as well as theoretical background knowledge.

At this premiere on November 14, Torben Löhner and Dorian Rudy, Master's students in Teacher Education and Plant Biotechnology presented the teaching unit on infection biology that they had designed together with

a RESIST team to the advanced biology course at Johannes-Kepler-Gymnasium in Garbsen. Around 15 young people from this year 11 class learned about theoretical and practical connections.

In particular, they learned about the virus detection method PCR, which can be used to detect and amplify genetic material. The course was able to detect SARS-CoV-2 viruses in samples and learn how to use a vortexer, pipettes, a centrifuge and a heating block, among other things. And if a specific question had arisen, researcher Annett Ziegler could have been called at her TWINCORE lab.

"This LeibnizLab was a unique experience, very exciting and varied," said 17-year-old Eylül. "The lab allowed us to gain practical experience in an experimental way. Torben and Dorian are very competent and teach in a relaxed manner," said 17-year-old Daniel. And his equally young classmate Lia found the experiments "totally exciting" and was delighted with the lab, as something like

this would otherwise not be possible in class. Teacher Tina Siuts is also enthusiastic: "The offer is very good because it fits in so well with the lessons. The pupils enjoy learning from Torben and Dorian because they feel very comfortable with them."

The LeibnizLAB

The LeibnizLAB brings exciting scientific experiments from the STEM subjects into the classroom so that pupils can experiment independently and learn about scientific work at an early age. The aim of the visits is to harness pupils' natural curiosity, make scientific phenomena present and tangible and thus get them excited about science and technology. The offer is free of charge. For further information please contact: Ina Fedrich, (0511) 762-8791, ina.fedrich@schulprojekte.uni-hannover.de.

Regulars' table

Where does the Rumba dance come from? Which countries border Pakistan? Which were the first animals sent into space by the USA? These were questions posed by the moderator of the Table Quizz at the Dublin Inn Hannover on September 21, 2023. The RESIST regulars' table that evening consisted of (post) doctoral students and RESIST coordinators, shown in the photo (from left):

Dr. Carina Jacobsen, Dr. Eugenia Faber, Dr. Eugenia Gripp, Dr. Saskia Stein, Tanvi Tikla and Sarah Harmening. They answered the questions as best they could, got to know each other better and also expanded their general knowledge. All readers who would like to know the answers can look them up in the imprint.



RESIST – About us

The clinicians and scientists working in the Cluster of Excellence RESIST (Resolving Infection Susceptibility) aim to offer scientific excellence for the people most vulnerable to infections. RESIST researchers work at **Hannover Medical School (MHH)**, **TWINCORE** Centre for Experimental and Clinical Infection Research, **Helmholtz Centre for Infection Research (HZI)** in Braunschweig, **Centre for Structural Systems Biology (CSSB)** Hamburg, **Centre for Chronic Immunodeficiency** Freiburg (CCI) and the **University of Veterinary Medicine Hannover**, Foundation (TiHo). The work of the Cluster of Excellence RESIST is funded by the **German Research Foundation (DFG)**.

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