SciLifeLab Report 2024

Table of contents

Director förord

Sed quid et, eum fugitis que ex ex entem qui cum sectur moditio eium invendaectur ad eaquia qui blam, ni quodign imaximin et modi odit quam quidelliam, volorep erionseritat re volent.

Imporemperum qui bea dolut moloressus qui utasperum acepro estibus non por mo eaquaeptio exerati odit as praectu saectat entionsent, officim oluptas itibercia con non porem voluptate sinctiu rehenti busciusae. Am estrum ius eumquiam verfers pellictatio iusdae volor mintotatem dolupti dis dolorem dolores endiae volore enditiundit moloreperro etur? Quis ea pelluptatum iminull atibus, odi illorupti sitaturis que voluptature nossin eseque laccum fugitatus, eat.

Ant dolupta sperum facite cuptassi quasped min nimpostota nimusam et ratus, saepers pelenimus doluptas core cus vendebis dolupta tiorem elloriassit am faccat eossitiist, nitatis ma natist alicimi ncienita cullis et archit liquian dendanis dolorehent eos plabo. Lor molupic toribust atent ab id qui te delique iuntent aut ut essit lauteseque pre nobis eos si odi nusam fuga. Nequo tem exces est lia doluptia volo ommod magnatiaepe nit iliciis digendita nam, quas et laboreperio voluptio omnimpostiis ex et es deres arum et, in cor maximporum remquidusae. Harchit etur, alis cor arum, comnime non consequi vollecabo. At venis experum hiliquam vollaccum qui comniam que voloresseque volorror min pe coriberum doluptatur, conemquo berum rem quia que excesciae posamet fugit aceatque iusandist, veniassime nullupt atibus si cum verfere rspient unt.

Laut el ma quos qui veniant ie porrpore dolupta turianeie proreru pi taspel molutre sam sin pro quamus apid quiatenivummod quo quat tsas res dolene duci corit quid quam eosande mporum, que seqriquate volorrum nimi.

Ant dolupta sperum facite cuptassi quasped min nimpostota nimusam et ratus, saepers pelenimus doluptas core cus vendebis dolupta tiorem elloriassit am faccat eossitiist, nitatis ma natist alicimi ncienita cullis et archit liquian dendanis dolorehent eos plabo. Lor molupic toribust atent ab id qui te delique iuntent aut ut essit lauteseque

SciLifeLab Report 2024

Summary

At SciLifeLab, we study life on Earth in all its complexity and components, from viruses and human health issues to global ecosystems and from molecular details to cells, tissues and organisms to planetary scale overviews. We are interested in human and environmental health, and the interaction between the two. When we say *life science*, this is what we mean.

We are a Swedish national infrastructure that combines cutting-edge technologies and instrumentation, data and computational capabilities and deep scientific expertise to advance molecular biosciences. SciLifeLab is a national research infrastructure by the Swedish government and leverages the strengths of all major universities across Sweden. We serve almost 2000 scientists annually with expertise and tools necessary to excel internationally in life science research.

SciLifeLab locations and affiliated universities

- Stockholm Campus Solna (KTH Royal Institute of Technology, Karolinska Institutet and Stockholm University)
- Uppsala (Uppsala University, Swedish University of Agricultural Sciences)
- Gothenburg (Chalmers University of Technology, University of Gothenburg)
- Linköping (Linköping University)
- Lund (Lund University)
- Umeå (Umeå University, Swedish University of Agricultural Sciences)
- Support by units at Örebro University

The research environment

- The network of SciLifeLab research group leaders and infrastructure team leaders currently consists of over 320 people, nominated from all SciLifeLab sites.
- SciLifeLab Fellows are successful in applying for and receiving research grants and scholarships both nationally and internationally. In 2024, they have been awarded grants worth more than SEK 200 million.
- Research collaborations and networks:
  - SciLifeLab's and Wallenberg's national program for data-driven life sciences, DDLS
  - Wallenberg AI, Autonomous Systems and Software Program, WASP, Wallenberg AI, Autonomous Systems and Software Program - Humanities and Society, WASP-HS
  - Cooperation agreement with European Molecular Biology Laboratory, EMBL
  - Collaboration between SciLifeLab's fellowship program, DDLS fellows and Wallenberg Centres for Molecular Medicine, PALS
  - SciLifeLab-coordinated postdoctoral program, PULSE

The research infrastructure

- SciLifeLab provides service within nine service areas:
  - Genomics
  - Clinical proteomics and immunomonitoring
  - Metabolomics
  - Spatial biology
  - Cellular and molecular imaging
  - Integrated structural biology
  - Chemical biology and gene editing
  - Drug discovery and development
  - Bioinformatics
- 496 FTEs, or 632 people, of which 52% are women and 48% men
- 67% of the people working in the research infrastructure have a PhD

496 FTEs

632 persons, 52% women

Life science data management, data science and artificial intelligence

- SciLifeLab and Wallenberg's national program for data-driven life sciences, DDLS, is a national program coordinated by SciLifeLab with KTH as host and a total of eleven partner organizations. The program is funded by the Knut and Alice Wallenberg Foundation with a total of SEK 3.3 billion over twelve years.
- Development of a national data platform for sharing research results, computational applications and AI models according to FAIR data management principles.
- Support for research data management for Open Science and simplified access to computing and storage infrastructure.
- Support for computational specialists, bioinformaticians and software engineers in life science research and strategic initiatives in AI and health data projects.

Statistics on services and scientific output from the infrastructure

- Around 4 500 research projects
- Over 1 900 unique users, including 1 640 academic users
- The infrastructure's resources were used by users from the health sector at 14%, by industry at 2% and by non-academic government agencies 2%.
- 116 training events organized or co-organized by the organizer or co-organizer
- 841 articles published with data, results and/or analysis from the infrastructure

~4 300

projects in 2024

<800

publications with data, results or analysis from the infrastructure yearly

Finances

- SEK 378 million in basic government funding for infrastructure, including targeted funds for pandemic preparedness.
- 174 MSEK SciLifeLab funding to the founding universities
- SEK 1.151 million in total turnover, in-cluding external funds and user fees.

The research infrastructure supported nearly 4,500 research projects during the year. The pharmaceutical platform has celebrated ten years as a resource to support academic projects in drug development to commercialization and societal benefit. SciLifeLab received a donation letter of SEK 600 million from the Knut and Alice Wallenberg Foundation for the expansion of the DDLS program and the launch of the new initiative Alpha Cell. In addition, SciLifeLab has been granted funding of SEK 6.88 million from the EU's Horizon Europe program for a three-year program, PULSE, within which a total of 48 international postdocs will be recruited.

April 17, 2023

Industry case: SciLifeLab infrastructure essential for Countagen to develop a same-day analysis kit for gene editing

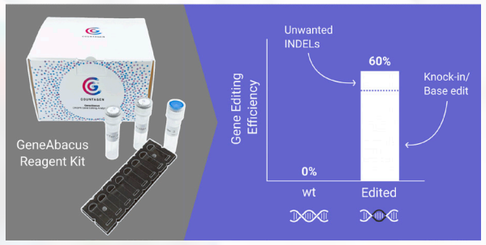
SciLifeLab's CRISPR Functional Genomics (CFG) infrastructure unit has played an essential role in aiding the development of GeneAbacus, a ready-to-use gene editing analysis kit soon to be launched by the start-up company, Countagen. The kit aims to reduce the time and resources needed to analyze gene editing efficiency and specificity. Using the infrastructure available at SciLifeLab, the company has benefitted from a test environment and expert advice in order to benchmark their product against current protocols.

"At the moment, we are addressing academic researchers who regularly use CRISPR to modify genes in cultured cells or model organisms to study basic cell biological processes or develop new therapies. Going forward, we plan to develop a higher throughput version suitable for the demands of larger pharma and biotech companies", says Felix Neumann, CEO and co-founder of Countagen.

The CRISPR Functional Genomics (CFG) infrastructure unit has been instrumental in various aspects such as providing access to high-end technology, offering expertise, validating tests, and supplying test batches for Countagen to utilize during product development.

"We make these kinds of gene edits all the time, so we have a lot of material to enable Countagen to test their product. To benchmark Countagen's kit against one of the current gold-standard methods, we use our digital droplet PCR (ddPCR) system. We've trained Countagen staff in ddPCR and its interpretation so they can use CFG's instrument for validation", says Bernhard Schmierer, head of the SciLifeLab CFG infrastructure unit.

The GeneAbacus kit aims to decrease the time required to analyze how well a CRISPR manipulation has performed, for example, by quantifying the percentage of cells in a gene-edited cell population that have the desired gene edit within a single day and without the need for expensive instruments or reagents.



"Saving time is a key selling point for us as our technology enables same-day gene editing analysis. Researchers often use multistep workflows for the analysis of pools and subsequent clonal selection, but, ideally, they can now use just one workflow – saving time and material costs. While ddPCR can be tricky and require optimization, and sequencing workflows can be complex and time-consuming, we will offer a ready-to-use kit for in-house analysis. With improved precision and sensitivity, and requiring only standard laboratory equipment, our objective is to provide a tool that rapidly delivers actionable results thereby accelerating gene editing research and development" says Felix Neumann.

Bernhard Schmierer and his team have also taken on the role of users, providing valuable feedback on the overall quality of the product. Most of the labwork in this collaboration is done by Anneke Navis at CFG.

"CFG acts as a testbed for Countagen's kit. We examine whether the product works as claimed and is user-friendly. It's crucial that someone not involved in the development can easily use it. We can provide feedback on these aspects. We evaluate the entire kit and, if we encounter unclear instructions or issues, we can address them," says Bernhard Schmierer.

Countagen presented the GeneAbacus offering at the "CRISPR as a research tool in cancer and regenerative medicine" symposium organized by CRISPR Functional Genomics, taking place between May 25 – 26 (2023), at Karolinska Institutet. They hoped to attract early access customers and establish collaborations.

Want to know more?

Contact

Countagen
Felix Neumann
CEO and co-founder
felix@countagen.com

SciLifeLab
Bernhard Schmierer
Head of Unit: CRISPR Functional Genomics
bernhard.schmierer@ki.se

SciLifeLab
Anneke Navis
Research Specialist at CRISPR Functional Genomics
anna.navis@ki.se

Isolde Palombo

December 11, 2024

Tell us a bit about yourself

I started as a project coordinator at SciLife-Lab in October 2022. I did my master's in Molecular Biology, followed by a PhD in Biochemistry at Stockholm University. After that, I moved to KI where I did two postdocs and an assistant professorship in the field of type 2 diabetes and endogenous fat accumulation.

After 8 years at KI (and 4 kids), I decided to leave research and continue to work with science without conducting it. I find it extremely valuable in my role at SciLifeLab to have been employed by all three Stockholm universities.

What part of the Science & SciLifeLab Prize for Young Scientists excites you most?

I am really proud of being a part of this prize, as it not only rewards scientific excellence but also the ability to communicate your science. I have always been frustrated about the fact that scientists in general are not very good at communicating their fantastic research. This is slowly changing, which makes me happy since it closes the gap between researchers and the rest of the world.

The prize is a very festive event and of course, it is very rewarding to welcome the winners to Stockholm, prepare all the events, and arrange all the meetings to make their week in Stockholm a memory for life.

Apart from project leading "Prize", what is your role at SciLifeLab?

I am part of the Event team at the Operations Office, so I manage and coordinate events and site visits to Campus Solna. I am also coordinating the Site coordinators and providing support for the various initiatives we have at campus Solna, which is a little bit of everything one could say.

What does an ideal winter holiday evening look like at the Palombo's?

We spend most of our free time in Åre, in the Swedish mountains. Ideally, the kids would be exhausted after a full day in the slopes and would fall asleep before 8 pm, so me and my husband could sit on the sofa, have a glass of wine, and look out at the beautiful winter landscape.

A more common scenario is that I fall asleep first, halfway through dinner. Either way, I love the feeling of being physically tired after being outside in the cold the entire day.

Margit Mahlapuu

May 22, 2024

Meet Margit Mahlapuu (GU), our new DDLS Cell & Molecular Biology Research Area Lead. She succeeded Erik Lindahl (SU) in July 2023, bringing new experience and a fresh perspective to the role.

Hello, Margit! Could you briefly describe your research?

The focus of my research is to combine studies in unique mouse models and well-characterized human cohorts with in vitro assays, to provide insight into molecular pathogenesis, and to find novel treatments and/or preventive strategies for type 2 diabetes (T2D), liver disease MASH, and related complex metabolic diseases with high unmet medical need.

How do you think your expertise can contribute to the DDLS program?

I believe that my translational background in academic research, but also in drug discovery and development in the pharma and biotech sector, will be a valuable asset to contribute to the DDLS program. Our expert group, representing a broad expertise in this complex subject field, will advise DDLS leadership in terms of research area-specific strategies and will also assist DDLS Data Science Node in shaping their scientific profile and priorities.

The mission of the DDLS program is to act at the global research front-line and have societal impact, could you give an example of that from your own field?

In the field of cell and molecular biology, and in my own research field specifically, the mechanistic studies that help us understand the molecular pathogenesis of diseases are instrumental. This understanding aids in the development of curative and affordable therapies to improve both the physical and mental health of individuals.

What are you looking forward to this year?

In relation to DDLS, this will be a very interesting year. New DDLS Fellows are being recruited and will start their research activities, and the DDLS research school for PhD students will be launched. Importantly, the newly recruited fellows and their team members will be integrated with the existing DDLS community and with other Wallenberg Foundation-funded programs such as WCMTM, contributing to a large and rapidly growing trans-disciplinary network with intensive collaborations.

What was the last book you read or the last movie you watched?

I accompanied my son to see Kung Fu Panda 4, which was a very interesting movie elaborating on the importance of educating the next generation of leaders and the speed of trust.

Short background

Margit has a diverse background in both academia and industry, having worked at AstraZeneca, Arexis, Biovitrum, PharmaSurgics, and Pergamum. Since 2019, she has been a Professor in Molecular Genetics at the Department of Chemistry and Molecular Biology at the University of Gothenburg.

During 2022-2023, Margit was a visiting professor at the Lipid Metabolism Laboratory, Charles Perkins Centre, University of Sydney, Australia, for four months. Today, in addition to her role as DDLS Research Area Lead, Margit serves as Co-Director of the Wallenberg Centre for Molecular and Translational Medicine (WCMTM) at the University of Gothenburg.

Summary of SciLifeLab's operations 2024

Highlights from 2024

1. **Infrastructure services:** in 2024, the research infrastructure supported nearly 4,500 research projects with over 1,900 unique users. Of the total resources of the infrastructure, 78% were used by national academic researchers, 14% by health researchers, 4% by international academic researchers, 2% by industry users and 2% by other government agencies. Of the academic users 60% were active in higher education institutions outside the founding universities.

2. **Scientific excellence:** During the period 2019 to 2024, 8,187 scientific publications were produced by SciLifeLab. SciLifeLab's scientific research results are of high quality and stand up very well to international competition. This applies both to results from SciLifeLab-affiliated researchers and projects run by infrastructure users. Based on analysis of the top 10% most cited publications, the following research areas have been identified as particularly prominent for SciLifeLab: biochemical research methods, biochemistry and molecular biology, cell biology, genetics and heredity and oncology.

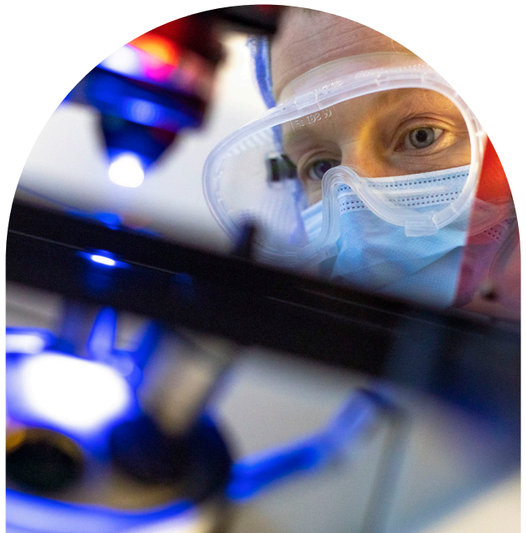
~4 300
projects
in 2024

3. **Strategic areas:**

   Pandemic laboratory preparedness: the pan-demic laboratory preparedness network is connects 22 infrastructure units, many of which cooperate with government agencies. In 2024, the capacity has been strengthened through increased collaboration within the network, including joint projects to test the developed pandemic preparedness.

   Translation to healthcare: SciLifeLab contributes to the continued development of technology-driven and data-driven precision medicine. During the year, we have initiated pilot projects to strengthen the contribution of SciLifeLab's platforms to precision medicine.

   Planetary biology: The planetary biology strategic area promotes collaboration between research and societal actors and utilizes SciLifeLab's infrastructure to support and develop research that contributes to societal benefit. The research focuses on the interaction between biological processes, the state of the Earth's environment and the evolution of life.



4. **Pharmaceutical development:** During the year, the pharmaceutical platform attracted some 40 researchers for con-sultation on project ideas. In total, six new programs were adopted during the year.

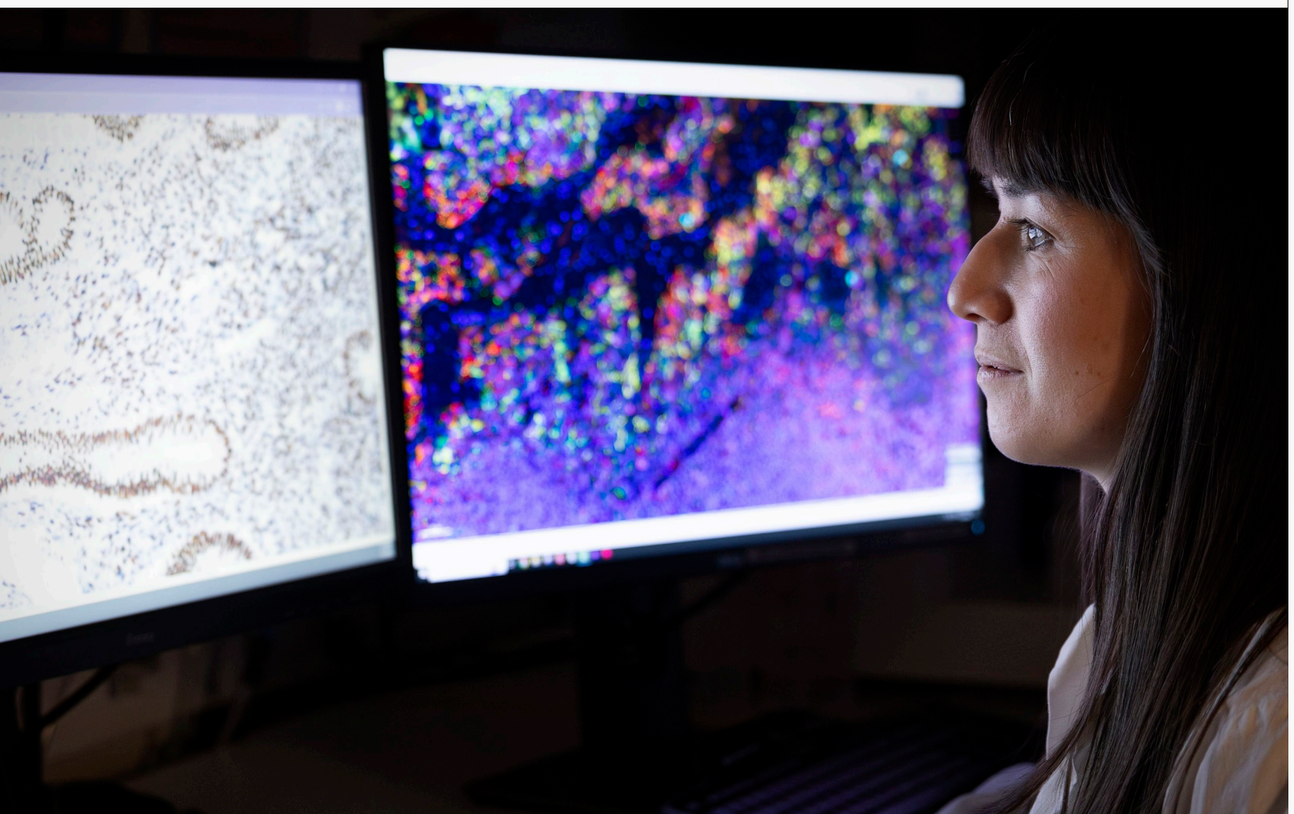
5. **SciLifeLab PULSE:** SciLifeLab has been awarded funding of EUR 6.88 million for SciLifeLab PULSE, Program for Future Leaders in Life Science, from the Marie Skłodowska-Curie Actions COFUND, part of the EU's Horizon Europe program. SciLifeLab PULSE is a five-year program where up to 48 international postdocs will be recruited.

6. **Coordination of national research pro-grams in digital health and AI:** During the year, SciLifeLab has been granted Vinnova funding for national coordination of four EU projects focusing on digital health in genomics, cancer imaging, AI and a pilot testing and experimental facility. The four projects are led in Sweden by Karolinska Institutet, Uppsala University, KTH and Umeå University.

7. **Data infrastructure:** SciLifeLab Data Center has strengthened the service catalog with new data services. An overview has also been added to the catalogue to enable new users to get an overview more quickly. International collaborations on open science and the FAIR data principles – Findable, Accessible, Interoperable, Reusable – aim to ensure that research data are precisely that.

8. **SciLifeLab and the Wallenberg National Program for Data-Driven Life Sciences (DDLS):** DDLS is a 12-year program coordinated by SciLifeLab that involves 11 partner organizations. In 2024, the second phase of recruitment of DDLS Fellows was completed and 36 out of a total of 39 fellows have been hired by the partner organizations. The recruitment of the remaining three was announced in the spring of 2025. The DDLS Graduate School started during the year and the first PhD students have been recruited.

9. **Alpha Cell:** During the year, SciLifeLab was granted an additional SEK 600 million from the Knut and Alice Wallenberg Foundation to expand the DDLS program and launch the new Alpha Cell initiative, which aims to increase the understanding of protein interactions and events in the cell in time and space.



August 23, 2024

New method for profiling complex biological dynamics at the single-molecule level developed: “broad applications across molecular biology, genetics, and drug discovery”

The MUSCLE method combines single-molecule fluorescence microscopy with next-generation sequencing, and makes it possible to profile the single-molecule dynamics of large numbers of different samples in parallel.

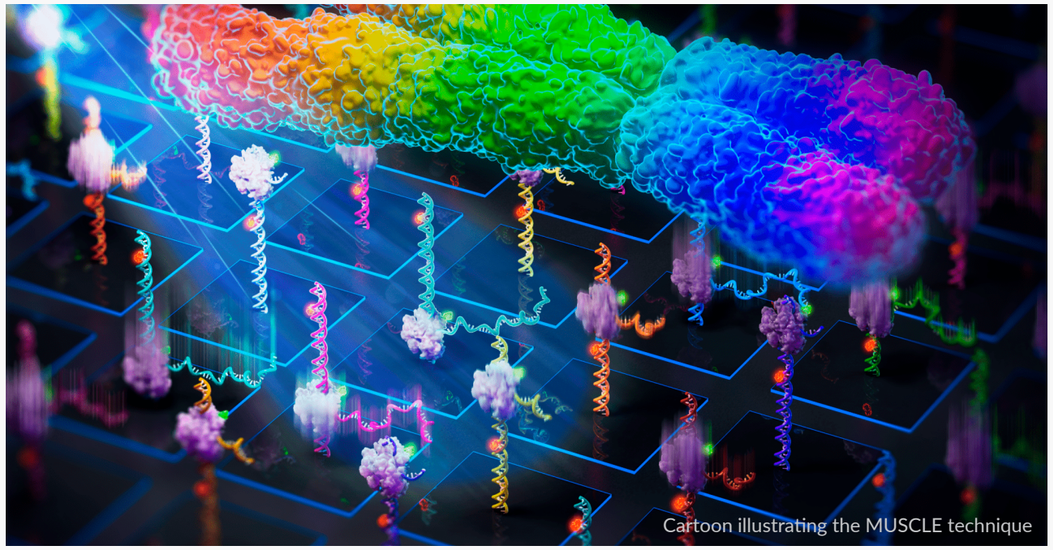
A collaboration led by SciLifeLab and Uppsala University researcher Prof. Sebastian Deindl has developed a method that vastly improves the ability to observe and analyze complex biological processes at the single-molecule level. Their work, titled *MUSCLE: MUltiplexed Single-molecule Characterization at the Library scalE*, is published in the journal Science.

The new method overcomes a significant limitation in the field of single-molecule fluorescence microscopy, which, until now, has been restricted by low throughput. Traditional approaches have been limited to studying a small number of representative samples, often leading to biases and missed opportunities for discovering novel insights within large libraries of molecules.

MUSCLE addresses this challenge by combining the mechanistic insights from single-molecule fluorescence microscopy with the high throughput capabilities of next-generation sequencing.

Profiling large numbers of distinct samples in parallel

The MUSCLE workflow begins by attaching a library of fluorescently labeled molecules onto a surface known as an Illumina MiSeq flow cell. This flow cell is then placed onto a single-molecule fluorescence microscope using a 3D-printed adapter, allowing researchers to observe the real-time dynamics of individual molecules across multiple fields of view.


Cartoon illustrating the MUSCLE technique

After imaging, the flow cell is subjected to standard Illumina sequencing, which generates clusters of identical copies from the molecules previously observed. These clusters are then matched with the corresponding molecules based on their positions on the flow cell.
“Spatially registering the single-molecule imaging and Illumina sequencing data turned out to be extremely challenging, but careful detective work to figure out the coordinate system used by the Illumina instrument allowed us to solve this problem” says Dr. Anton Sabantsev.

This innovative approach allows researchers to simultaneously profile the dynamics of a vast array of sequences, providing a more comprehensive understanding of complex biological processes.

“Our method allows for the direct observation of dynamic molecular behaviors across extensive libraries, significantly enhancing our ability to uncover general trends, outlier behaviors, and unique dynamic signatures that would otherwise remain hidden” says Sebastian Deindl, senior author of the study. “MUSCLE transforms how we study the intricate dynamics of biomolecules, with broad applications across molecular biology, genetics, and drug discovery.”

Teamwork essential

“Key to this very challenging multi-year effort was the wonderful teamwork among the members of our group. Everyone brought something different to the table, which was crucial for overcoming the technical hurdles we faced” says Dr. Guanzhong Mao, one of the co-first authors, together with Dr. Javier Aguirre Rivera, Dr. Anton Sabantsev and Mikhail Panfilov.

The research team also included Magnus Lindell from the SciLifeLab National Genomics Infrastructure in Uppsala, who facilitated the next-generation sequencing into the MUSCLE workflow.

Democratization of advanced methods

Given its reliance on widely available fluorescence microscopy and MiSeq instruments, along with the ease of fabricating the necessary adapter using 3D printing, the MUSCLE method is highly accessible to the broader scientific community. It can be adapted to study a wide range of proteins interacting with nucleic acids, as well as DNA-barcoded proteins, compounds, or ligands.

“This breakthrough opens the door to more accurate and comprehensive studies of biological systems, where understanding the full spectrum of molecular behavior is critical. The MUSCLE method is expected to have a profound impact on the study of complex molecular dynamics as a function of sequence or chemical space, enabling researchers to explore previously uncharted territories in biology” says Sebastian Deindl.

The article can be found here:
https://www.science.org/doi/10.1126/science.adn5371

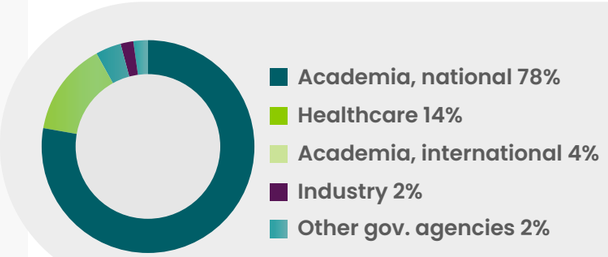
SciLifeLab's role as a national research infrastructure

The mission of SciLifeLab's research infrastructure is to provide world-leading technologies, unique and expensive equipment and expertise to the Swedish research community. The overall goal is to promote internationally impactful life science research that would otherwise not have been possible to achieve in Sweden. The national mission of the research infrastructure means that it must be available on equal terms to researchers at all of Sweden's higher education institutions.

SciLifeLab's range of technologies enables researchers to utilize a broad palette of complementary methods to investigate both biomolecular research hypotheses and large, complex questions with the aim of understanding and solving societal challenges in areas such as health, environment and climate.

Users of the SciLifeLab research infrastructure

In 2024, SciLifeLab had 1,908 individual users, of which 1,640 were researchers working in academia. This is an increase of seven and four percentage points respectively compared to 2023. The distri-bution of academic researchers based on higher education institutions is presented in Figure 4 and shows that SciLifeLab's infrastructure has a well-established national user base. The bioinformatics unit Support for Computational Resources in Uppsala had 800 registered user accounts in 2024.



These user accounts represent researchers from all over Sweden who have made use of the data storage and computational capacity offered by the unit.

In addition to academic users, the SciLife-Lab research infrastructure also had 268 individual users active in healthcare, industry and other government agencies. Figure 5 shows how the total resources of the research infrastructure, normalized for the number of FTEs working in each unit, were used in 2024. Users in healthcare, the private sector and other government agencies accounted for a total of 18% of the resources used. Researchers from over 120 companies used the research infrastructure during the year.

Strategic Areas

SciLifeLab's research community and research infrastructure are combined in strategic areas with focus on Translation to Healthcare, Pandemic Laboratory Prep-aredness and Planetary Biology.

Translation to Healthcare

SciLifeLab's role in translation to healthcare is to work with partners in healthcare and our already well-established university partners to ensure that technological developments make it towards clinical research and healthcare deployment quickly.

Part of the translation to healthcare ambition is precision medicine, including goals of individualized diagnosis, treatment and follow-up based on the patient's own conditions. Precision medicine can be based on, for example, molecular analyses or advanced image analyses.

Pandemic Laboratory Preparedness

SciLifeLab's program for pandemic lab-oratory preparedness has earmarked governmental funding. The program aims to make Sweden better equipped to assist in future crises. Through research, skills development and technology development, ongoing laboratory activities will be optimized to support and complement other societal functions such as authorities, municipalities and regions. The program creates a long-term laboratory capacity in the field of infectious diseases that is important not only during pandemics but also between pandemics. Between pandemics, the program will support research on infectious diseases in general, including antibiotic resistance, and related areas such as precision medicine.

Planetary Biology

SciLifeLab's Planetary Biology supports and develops research focusing on how biological processes interact with the Earth's environment and influence the evolution of life. The scope includes biodiversity, climate change impacts, biogeochemical processes, ecosystem functioning and the ability to support a rapidly growing population. Research in this area is multidisciplinary and large-scale and requires broad collaboration and coordination between research groups, infrastructure and societal actors. Research in molecular biosciences helps us understand the origin of life and the background to the adaptations that drive biodiversity, from genes to ecosystems. This knowledge is closely linked to methodological and technological development, but also to multidisciplinary approaches and translational focus in research – were applications and societal needs guide problem formulation.

Training

SciLifeLab provides advanced, data- and technology-driven research training to the Swedish research community. Training covers knowledge and understanding of the wide range of advanced techniques and data analysis methods available at the SciLifeLab research infrastructure. Each year, over 150 advanced courses and educational events are held, contributing to the upskilling of the broad research community and thereby facilitating high-level research and innovation.

Digital Infrastructure and Integrated Data Service

The life science area is experiencing a sig-nificant increase in data generation thanks to technological advancements that are making it exponentially easier to generate data, from entire ecosystems down to individual cells. What used to take years can now be done in days.

This vast amount of data must be managed appropriately and ethically to ensure accessibility and reusability for researchers across the world. But today, only a small portion of all data is handled correctly, resulting in missed opportunities for scientific discoveries. At the same time, many researchers need more tools and knowledge to conduct data-driven research, and we need to strengthen the Swedish research community's competencies.

At SciLifeLab, we consider data one of our operations' most valuable and long-lasting products. We strive to ensure that our data is FAIR, handled according to open science standards, and of the greatest long-term value to the scientific community.

SciLifeLab strengthens Sweden as a research nation in the molecular life sciences. By acting as a national hub, SciLifeLab coordinates various initiatives in the research area. The aim is to strengthen and build new networks and create collabora-tive projects that contribute to increased international competitiveness.

We have over 320 team leaders. Their ex-pertise and active, close collaboration with SciLifeLab's molecular life sciences activities drive the development of scientific research and enable the infrastructure's technologies and expertise to be at the forefront.

<320

group leaders, distributed across all SciLifeLab sites

SciLifeLab brings together researchers across traditional departmental, university and sectoral boundaries, facilitating net-working and interdisciplinary studies in an inspiring research environment. Bibliometric analysis of SciLifeLab's pro-duction of scientific publications shows that SciLifeLab contributes to increased impact for Swedish research in the life sciences at both national and international levels, see section *SciLifeLab's publications and impact.*

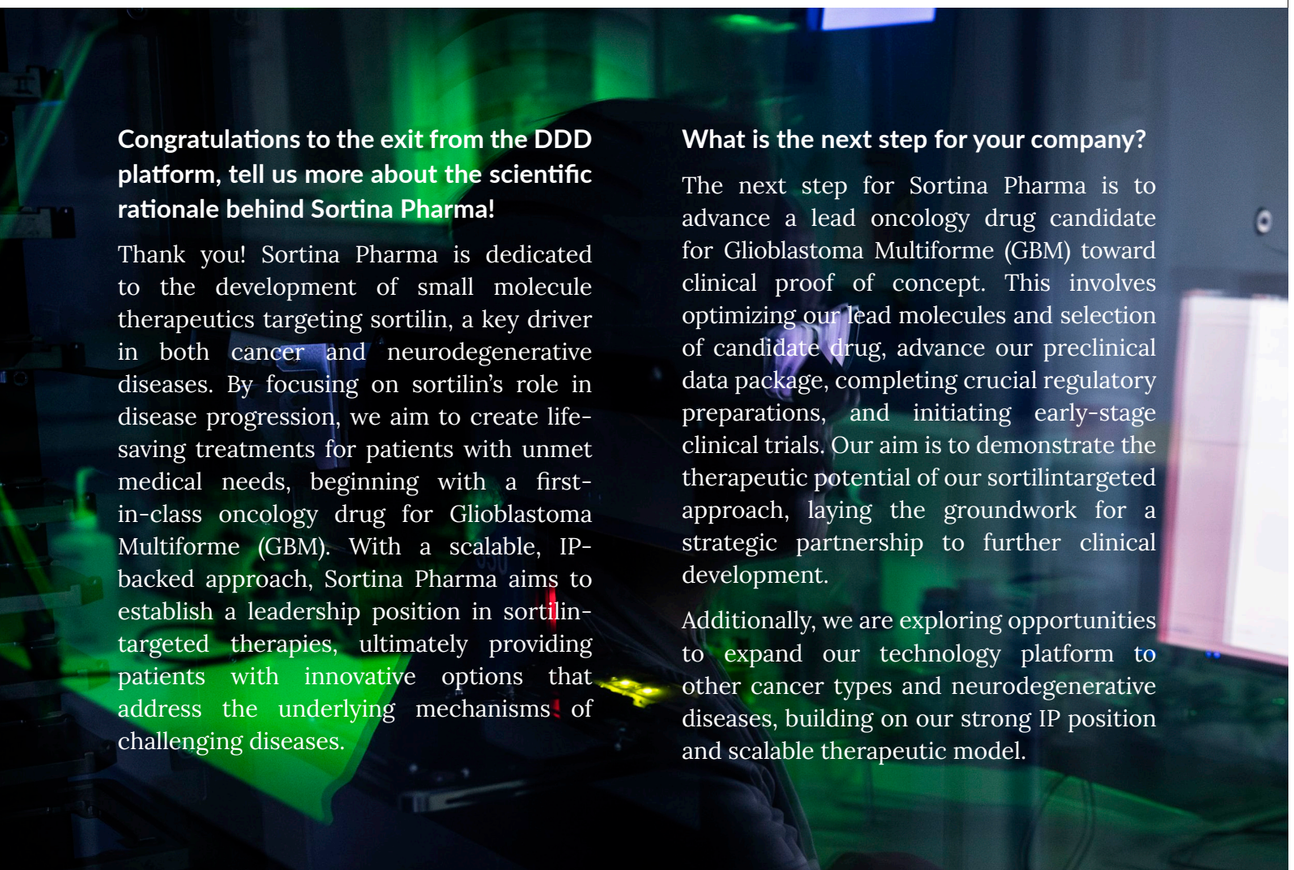
Exit

November 13, 2024

Sortina Pharma – exit from SciLifeLab's Drug Discovery and Development Platform

On November 12, Sortina Pharma made an exit from SciLifeLab's Drug Discovery and Development platform (DDD) with a project focusing on the therapeutic potential of sortilin – a membrane glycoprotein in the vacuolar protein sorting 10 protein (Vps10p) family of sorting receptors.

The exit took place at the 10-year anniversary symposium held by the platform, and we got the opportunity to congratulate Sortina Pharma founders Sara Rhost, CEO and Göran Landberg, University of Gothenburg and ask a few questions.



Congratulations to the exit from the DDD platform, tell us more about the scientific rationale behind Sortina Pharma!

Thank you! Sortina Pharma is dedicated to the development of small molecule therapeutics targeting sortilin, a key driver in both cancer and neurodegenerative diseases. By focusing on sortilin's role in disease progression, we aim to create life-saving treatments for patients with unmet medical needs, beginning with a first-in-class oncology drug for Glioblastoma Multiforme (GBM). With a scalable, IP-backed approach, Sortina Pharma aims to establish a leadership position in sortilin-targeted therapies, ultimately providing patients with innovative options that address the underlying mechanisms of challenging diseases.

What has the DDD platform provided to Sortina Pharma?

The DDD platform has provided us with a range of expertise and analytical support for advancing our drug development. Key contributions include medicinal chemistry insights, ADME analyses, and biophysical screening. Additionally, the platform has supported us in therapeutic protein engineering and preclinical analyses, enhancing our ability to validate our therapeutic candidates early in the development process.

What is the next step for your company?

The next step for Sortina Pharma is to advance a lead oncology drug candidate for Glioblastoma Multiforme (GBM) toward clinical proof of concept. This involves optimizing our lead molecules and selection of candidate drug, advance our preclinical data package, completing crucial regulatory preparations, and initiating early-stage clinical trials. Our aim is to demonstrate the therapeutic potential of our sortilintargeted approach, laying the groundwork for a strategic partnership to further clinical development.

Additionally, we are exploring opportunities to expand our technology platform to other cancer types and neurodegenerative diseases, building on our strong IP position and scalable therapeutic model.

Where do you see Sortina Pharma in say, five to ten years?

In five to ten years, we envision Sortina Pharma as a leader in sortilintargeted therapeutics, with a diversified portfolio including both cancer and neurodegenerative diseases. A strategic M&A of the company once our lead drug candidate for Glioblastoma Multiforme reaches clinical proof of concept. Through strategic partnerships, potential mergers and acquisitions (M&A), and out-licensing opportunities, Sortina Pharma aims to establish a robust global presence.

Kristian Sandberg, Director for the national research infrastructure SciLifeLab Drug Discovery and Development platform has been the sponsor of the development process from SciLifeLab's side.

"Working with Sortina Pharma has been an inspiring journey. Their focus on sortilin's potential exemplifies the kind of pioneering research SciLifeLab's Drug Discovery and Development Platform is designed to support. This exit underscores our commitment to advancing innovative therapeutic solutions, and we look forward to seeing Sortina Pharma's continued progress in the development of sortilin-targeted treatments, says Kristian Sandberg, Director for the national research infrastructure SciLifeLab Drug Discovery and Development platform.

Sara Díaz Moreno

May 2, 2024

Hi Sara, you work as lab safety coordinator at SciLifeLab Campus Solna, what is the scope of that responsibility?

I assist research groups and infrastructure facilities in implementing proper lab safety and overall workplace safety practices. That includes to work in compliance with regulations from the Swedish Work Environment Authority (Arbetsmiljöverket) and other agencies. My primary focus is on promoting lab safety, but also fire safety, and other critical aspects of the physical work environment.

My responsibilities include conducting safety introductions, coordinating safety inspections, updating routines, and addressing a wide range of safety and work environment inquiries. I aim to create a safety-conscious culture and make sure everyone feels confident about working safely.

When do you feel proud at work?

I feel proud at work when I see group leaders investing time in their employees' safety and striving to do their best. Then, I think the system works. I enjoy helping them find the right ways to support their teams. This teamwork towards a safer work environment is really rewarding.

What is your professional background?

I am a molecular biologist by training. I studied in Malaga, Spain – which is where I come from – and I also defended my PhD thesis there. For my PhD I did a comparative study of gene expression across various types of wood to identify genes influencing wood pro-perties. I moved to Sweden and started at KTH as a postdoc in 2011. Later, I became more interested in lab safety and safety routines and took more responsibility in this area. I started at SciLifeLab in December 2020. Today, I am studying a master's program in occupational health and safety, to broaden my skills.

What is the best – and worst – with your job?

I love networking with colleagues in my field, exchanging experiences, and learning new ways to improve lab safety together. Also, being part of a great team at Site Support makes my days easier and more enjoyable.

On the other hand, the toughest part is dealing with incidents. Fortunately, they don't happen often, but when they do occur, it serves as a reminder that something has gone wrong.

What do you like to do on a day off?

I enjoy having fika with friends and family – I like sweets, and also enjoy baking when I have the time. I like the challenge to adapt recipes so that they can be made without milk and egg, carrot cake is a favourite!

And I have also started doing yoga at home through an online program that I have access to thanks to the KTH health care allowance – friskvårdsbidrag. When the weather is nice, I like to go for a run, but unfortunately, it does not happen very often.

SciLifeLab PULSE: an International Postdoctoral Program Empowering Future Leaders in Life Sciences

August 27, 2024

SciLifeLab has received a funding invitation from Marie Skłodowska-Curie Actions COFUND, part of EU's Horizon Europe, for SciLifeLab PULSE (Program for Future Leaders in Life Science), a comprehensive 5-year postdoctoral program. The program will train 48 future leaders in life sciences with a launch following the final grant decision in fall 2024. Postdocs will be recruited in two calls (January 2025 and 2026), with the first cohort of 24 postdocs starting in October 2025.

PULSE will focus on innovative, funda-mental and translational research carried out in supportive and diverse academic and industrial environments, preparing postdocs with necessary skills for long-term career sustainability. The program will offer 3-year fellowships hosted by one of nine Swedish universities with secondments at 24 academic and non-academic partners in Sweden and abroad.

"This is a unique program, from a strategic Swedish perspective. It will enable inter-disciplinary collaboration and bridge institutional barriers. For instance, it brings together nine universities under a joint recruitment process, which is a rare and commendable approach in academia", says Erik Litborn, national contact point for Marie Skłodowska-Curie Actions (Horizon Europe) at Vinnova.

Advancing research to address key scientific challenges

PULSE will stand out by offering unique international research and training oppor-tunities built upon SciLifeLab's advanced infrastructure for molecular life sciences. The program aims to foster a new generation of researchers capable of addressing significant scientific challenges across five key areas:

- Cell & Molecular Biology
- Precision Medicine & Diagnostics
- Evolution & Biodiversity
- Epidemiology and Infection Biology
- Drug Discovery & Development

Immersed in the vibrant SciLifeLab community – home to hundreds of distin-guished research groups, the *SciLifeLab & Wallenberg National Program for Data-Driven Life Science*, and strong ties to other major national and international initiatives – they will have access to extensive and unparalleled training opportunities facilitating success as they pursue their fellowship projects and long-term career goals.

The PULSE training catalog will be openly accessible and fully aligned with FAIR principles, making it a valuable resource for the pan-European postgraduate life science research and training community.

Bridging the gap between basic research and innovation

PULSE will offer a unique setup, enabling candidates to choose between academic (32 positions) or entrepreneurial (16 positions) tracks (recruited in two calls).

Both tracks will include advanced training in research and transferable skills, integrating international, interdisciplinary and intersectoral elements with annual networking events to further foster collaborations and career development.

The integrative approach to training establishes a strong foundation for future leaders in life sciences, breaking down barriers between sectors and geographic distances while facilitating the formation of professional networks. Postdocs will benefit from robust career support through a supervisor/mentor panel and specialized training via secondments with PULSE's international academic and non-academic partners, to gain a well-developed toolbox for long-term success.

"By giving postdocs the tools, networks, and experiences they need to succeed in entrepreneurship, PULSE bridges essential gaps and provides the expertise crucial for driving innovation. This program ensures that researchers are ready to excel and lead in the fast-paced world of start-ups. This program is a fantastic opportunity for small, innovative companies, like Akiram, and we're truly excited about the chance to engage with talented scientists and advance our business" says Marika Nestor, Professor, Biomedical Radiation Sciences, and co-founder of Akiram Therapeutics (which is a partner of PULSE).

Emphasizing diversity, equity, and inclusion

SciLifeLab recognizes the importance of, and enthusiastically embraces, diversity and inclusion at all levels and roles within its ecosystem. By making science more representative, novel discoveries will emerge that benefit lives across the globe. To fully realize the program's true potential, PULSE will systematically integrate gender aspects and diversity considerations, to proactively address unconscious and unintended biases across all project areas. This commitment includes utilizing targeted outreach material to encourage applications from individuals across all continents. Specifically, the PULSE dissemination strategy will actively promote applications from researchers from diverse backgrounds, encompassing differences in gender, nationality, socio-economic status and age.

Setting new standards for postdoctoral training

PULSE aims to achieve measurable scientific outputs, such as impactful research, new technologies, translational drug discoveries, prototype drugs, and intellectual property. The program prioritizes long-term career development and scientific success, empowering postdocs to progress into academic or industrial positions, or even to establish start-ups that directly address societal needs. Additionally, PULSE strives to enhance the global visibility of life science research through outreach activities, taking advantage of the highly interactive professional networks established to promote respect and trust in science.

"To advance curiosity-driven, innovative, and translational research while also supporting sustainable careers, increased cooperation across sectors is essential. The SciLifeLab postdoc program PULSE, with partners from academia, research infrastructures, research institutes, as well as biotech and medtech companies, will provide a common foundation for future leaders in life sciences, reduce barriers between sectors and regions, and help build strong networks for future collaborations.

This initiative will not only strengthen Sweden as a life science nation but also offer significant individual benefits by enhancing personal development and international career opportunities. We are grateful for the support from Marie Skłodowska-Curie Actions COFUND to our program, and look forward to the official launch of the program on September 1, 2025", says Mia Phillipson, SciLifeLab Co-Director and Director of the SciLifeLab PULSE program.

Read more on:
https://www.scilifelab.se/research/pulse

SciLifeLab PULSE (Program for Future Leaders in Life Science) is a five-year postdoctoral program which has received a funding invitation from Marie Skłodowska-Curie Actions COFUND (part of EU's Horizon Europe). It will be coordinated by SciLifeLab, and have nine implementing partners and 24 associated partners.

Implementing partners: Karolinska Institutet, KTH Royal Institute of Technology, Linköping University, Lund University, Stockholm University, Umeå University, University of Gothenburg, Uppsala University, Örebro University, SciLifeLab Drug Discovery & Development Platform.

Associated partners: Affibody, Akiram Therapeutics, AstraZeneca, Beactica Therapeutics, CoVaRR Net, Cytiva, Eatris, EMBL, Human Technopole, Lif (The research-based pharmaceutical industry), Lipum, Malmö University, Max IV, Orion Pharma, ProSilico, QureTech Bio, Red Glead Discovery, RISE, Strike Pharma, SweDeliver, SwedenBIO, Testa Center, Toleranzia, VIB.

Research

The SciLifeLab and Wallenberg National Program for Data-Driven Life Science (DDLS)

Life science is becoming increasingly dependent on large and complex data sets, which are more likely to drive scientific discovery if they are easily discoverable, accessible, interoperable, reusable, and available in real time.

The SciLifeLab and Wallenberg National Program for Data-Driven Life Science recruits and trains the next generation of life scientists to have a solid foundation in computational biology and data science. The program engages the national research community to apply data science and data-driven research principles and develop new tools and approaches for data handling, artificial intelligence, and dynamic life models.

SciLifeLab coordinates this 12-year initiative, a collaboration between ten universities and the Swedish Museum of Natural History. The Knut and Alice Wallenberg Foundation funds the program with SEK 3.1 billion (USD 300 million).

Collaborations

Collaboration with activities outside the academic environment, such as healthcare, industry, other government agencies and international actors, is a strategically prioritized part of SciLifeLab. Collaboration takes place at all different levels within SciLifeLab.

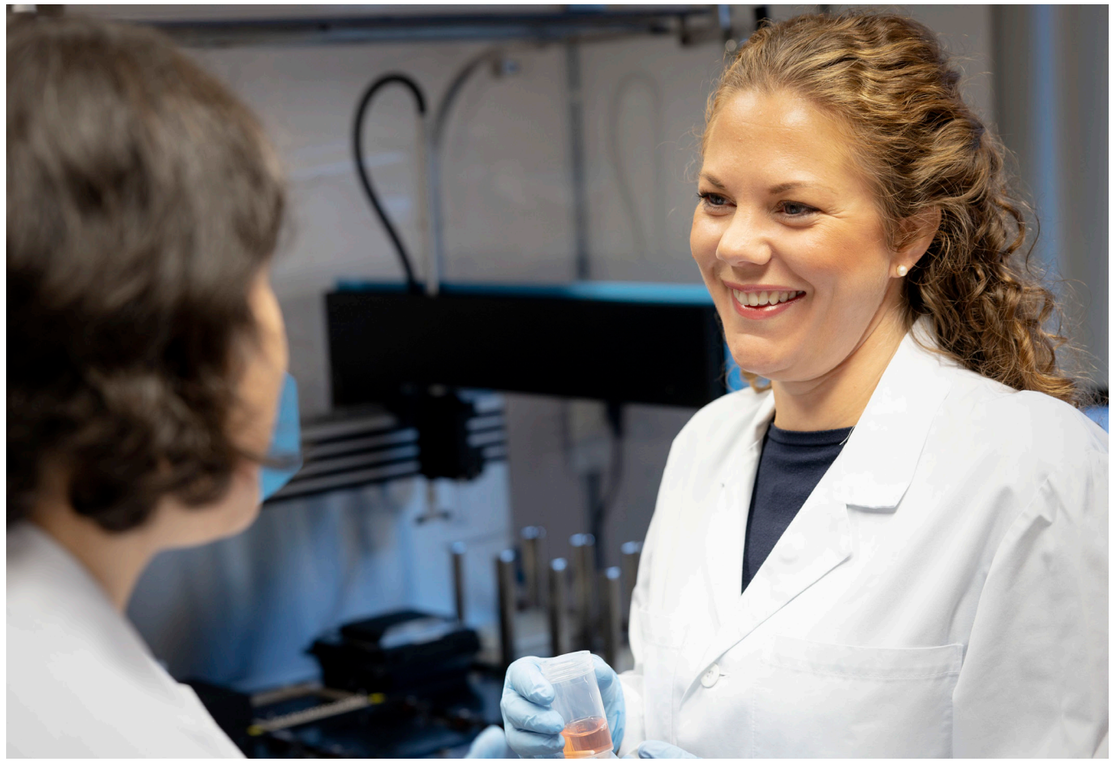
Governmental
- National research infrastructure **289 MSEK**
- SFO funding **174,5 MSEK**
- Drug development **59 MSEK**
- Pandemic laboratory preparedness **32 MSEK**

Non-governmental
- DDLS **320,5 MSEK**

Funding

The allocation of infrastructure funds to SciLifeLab in 2024 was SEK 346 million, of which SEK 59 million relates to drug development. A total of SEK 365 million was distributed from this year's allocation and reserved funds from previous years. In total, 88% of the funds were allocated to platforms, units and activities directly linked to them.

To complement and strengthen SciLifeLab's infrastructure, activities at universities other than the founding universities were funded with a total of SEK 65 million, corresponding to 18 percent of the allocated funds. A total of 12 percent of SciLifeLab's national funds were used for coordination of research activities, national networks, training, collaboration, communication, administration and salaries for management functions and operational support staff.



The allocation of funds for pandemic laboratory preparedness in 2024 was SEK 31 million. SEK 34 million was distributed from this year's allocation and reserved funds from previous years.

<200 MSEK

external funds awarded SciLifeLab Fellows in 2024

External funding

In addition to SciLifeLab's core funding, most of the research infrastructure units receive substantial funds from other funding sources as well as revenues from user fees. Information on this other funding for the infrastructure is collected by SciLifeLab as part of the units' annual reporting, and in 2024 these funds amounted to just under SEK 800 million, of which user fees accounted for 50 percent. Of the other funding, just over SEK 100 million was provided by Swedish higher education institutions and just under SEK 300 million by external funding bodies. The largest contributors among the external funding bodies were the Swedish Research Council and the Knut and Alice Wallenberg Foundation. The remaining funds came from other Swedish government funders and private foundations, health care organizations, EU and other international funders.

December 11, 2024

Spatial Proteomics Method of the Year: “great acknowledgement”

Nature Methods has chosen spatial pro-teomics as Method of the Year “for its critical role in revealing the organization of complex tissues”. We asked Associate Professor Charlotte Stadler, Co-Director of the Spatial Biology platform and Head of the Spatial Proteomics unit at SciLifeLab for some insights into the method – or methods to be precise.

What is spatial proteomics?

Spatial proteomics is an umbrella term of immunohistochemical methods used to profile complex tissues. While imaging techniques including immunofluorescence have been around for a long time, recent advances now allow for tens – or even a hundred – proteins to be analyzed within a single tissue section. This allows for much deeper information to be obtained.

What’s the strengths of spatial proteomics?

The inherent imaging itself and single cell resolution, and that the tissue structure is retained. As such, cells are defined and studied within their natural context. Therefore, the link between tissue architecture and function can be explored in a spatial context.

Why do you think spatial proteomics has been chosen as method of the year?

Because of the strengths mentioned, but also the recent advancements in the imaging field that now allows for highly multiplexed experiments to be done. Before they were limited to studies of a few markers in the same sample. Now there are several approaches to capture a multitude of different protein markers, and also together with transcripts or other spatial modalities. One should also not forget that the proteins, which is the readout from these assays, are the functional entities of our cells and hence mapping their expression can tell us more about the functional states of the cells.

What’s next for spatial proteomics?

The next steps for spatial proteomics is the continuous integration with other omics types, with equally good resolution and image quality. An interesting new combination that has not been explored so much yet is the combination of proteins and small molecules such as metabolites and lipids.

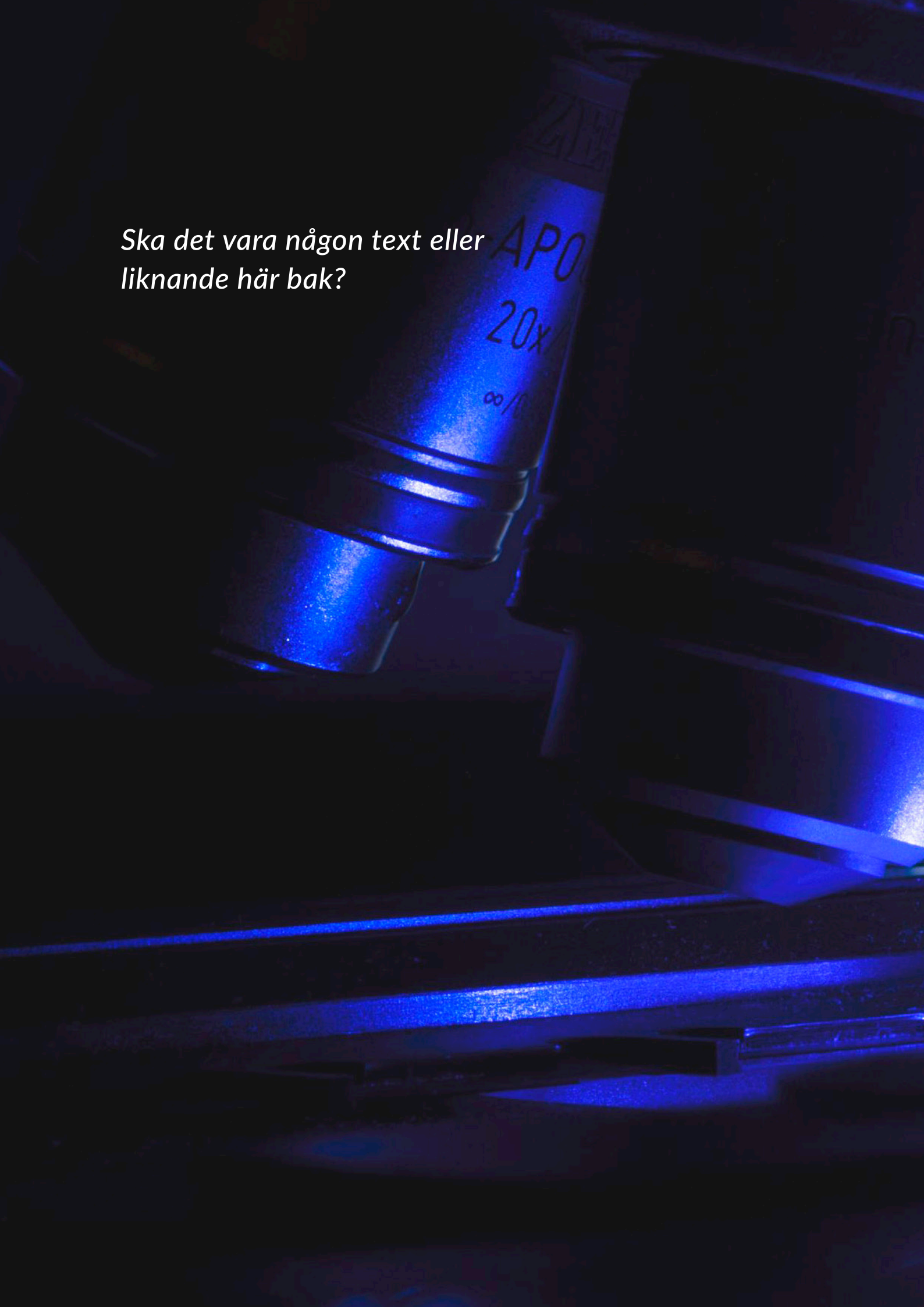
In the Spatial Proteomics Unit at Scilifelab we are also working to complement the multiplexed imaging of proteins with in situ proximity ligation assay (PLA), to look at protein interactions and cell signalling within the tissue microenvironment.

Also, for the field in general, moving from 2D to 3D will lead to yet more information of tissue and cellular structures. At the same time, much focus is put on bringing these methods closer to clinical practice, they have huge potential to contribute to better diagnosis and treatment selection.

What services does SciLifeLab offer within spatial proteomics?

At SciLifeLab we offer full project support to generate spatial proteomics data using a portfolio of different technologies in-cluding Akoya Biosciences, Inc. PhenoCycler Fusion and Lunaphore COMET – Lunaphore is a Bio-Techne brand, and various assays compatible with the new instrument from Thermo Fisher Scientific, Evos S1000. If users are ready to make use of these informative methods but lack the know-how and instruments, we are happy to discuss the project and offer support.

“I am very happy to see this great acknow-ledgement for immunohistochemistry based methods within Spatial Omics, used for profiling the functional entities of cells – proteins!” concludes Charlotte Stadler.



Ska det vara någon text eller liknande här bak?