ENABLING LIFE SCIENCE RESEARCH



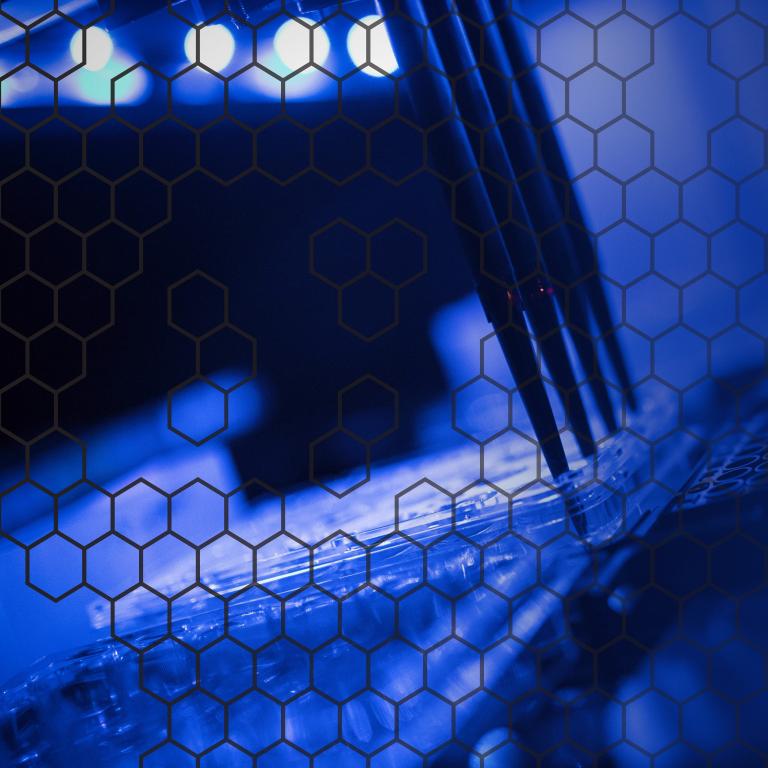


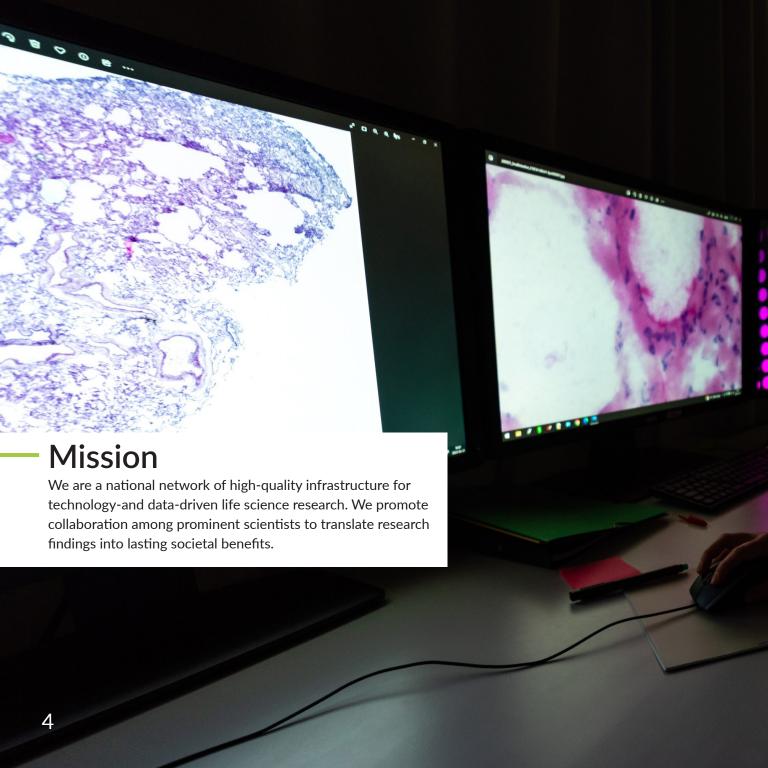
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About SciLifeLab

SciLifeLab (Science for Life Laboratory) is a Swedish national infrastructure for life sciences that combines cutting-edge technologies and instrumentation, data and computational capabilities, and deep scientific expertise to advance molecular biosciences. Established as a joint initiative between four universities in Stockholm and Uppsala in 2010, today SciLifeLab is funded as a national research infrastructure by the Swedish government. SciLifeLab leverages the strengths of all major universities across Sweden, with the latest official SciLifeLab sites launched in Lund, Göteborg, Linköping, and Umeå. We serve almost 2000 scientists annually with the expertise and tools necessary to excel internationally in life sciences research. At SciLifeLab, we study life on Earth in all its complexity and components: from viruses and human health to global ecosystems, and from molecular details to cells, tissues, and organisms. We are interested in human and environmental health, and the interaction between the two.



SciLifeLab's Pillars

Research Infrastructure: State-of-theart technologies and expertise across Sweden create a supportive environment for conducting life sciences research at the highest level.

- 1800 unique users
- 3700 projects per year
- 600 technology experts

SciLifeLab Training: Integrates and coordinates services and resources across SciLifeLab to promote lifelong learning.

- 150 national and international educational events each year
- Openly available support, standards and best practices for training

Research Community: Addressing the most pressing scientific questions and societal challenges via research collaboration.

- 300 SciLifeLab group leaders across all major universities in Sweden
- Opportunities for multi-disciplinary collaborations across universities and disciplines
- Promoting recruitment and training of talent, such as the SciLifeLab fellows
- Scientists building a diverse and inclusive community

Transforming data into knowledge: The SciLifeLab and Wallenberg National Program for Data-Driven Life Science (DDLS).

- 39 new research group leaders to be recruited (tenure-track DDLS fellows)
- 260 Ph.D. students in academia and industry to attend a DDLS research school
- 210 postdoctoral positions to be created in academia and industry
- Support for data sharing, analysis, and AI



Linda Sandblad

Site Director for SciLifeLab in Umeå Scientific Director for Cell and Molecular Imaging at the Umeå Center for Electron Microscopy

What is your role in SciLifeLab's research infrastructure?

I work with electron microscopy, coordinating and developing methods and instruments for cell and molecular imaging.

What do you like best about SciLifeLab?

The best thing about SciLifeLab is the access it provides Swedish researchers to some of the world's best research infrastructure. With top-notch equipment and expertise, scientists have the resources they need to conduct cutting-edge research.

What is the most challenging part of having a national research infrastructure?

One of the challenges we face is ensuring an equal national network of research infrastructure, with resources based at universities all over Sweden. This allows all researchers, regardless of which university they attend, to have the same opportunities to conduct research. It's an ongoing effort that we think about constantly.



Research Infrastructure

Life sciences research is becoming increasingly multidisciplinary and complex. Gaining fundamental insights into organisms, ecosystems, and the environment requires a broad array of complementary technologies that generate vast amounts of data and for which collaboration is critical. Sustaining this level of technology and transforming data into knowledge requires capacities beyond those held by single research groups or individual universities.

At SciLifeLab, we offer access to a range of pioneering technologies and expertise in life sciences. Our dedicated research infrastructure staff scientists offer collaborative support throughout the experimental process—from study design to data analysis. Together, our facilities enable the scientific endeavors of thousands of researchers from academia, industry, and healthcare.

Our combined infrastructure offerings to researchers (see box) have the capacity to address scientific questions spanning from fundamental research to healthcare services and translational research. Each year, our infrastructure serves 1800 individual users. Most of our technologies are application agnostic, which means that SciLifeLab can support research across various life science disciplines. We aim to provide tools and knowledge that help scientists achieve their objectives and support the development of life sciences.

Infrastructure at SciLifeLab

- Genomics (including clinical genomics)
- Proteomics (including clinical proteomics and immunomonitoring)
- Metabolomics and exposomics
- Spatial biology

- Cellular and molecular imaging
- Structural biology
- Chemical biology and genome engineering
- Drug discovery
- Bioinformatics

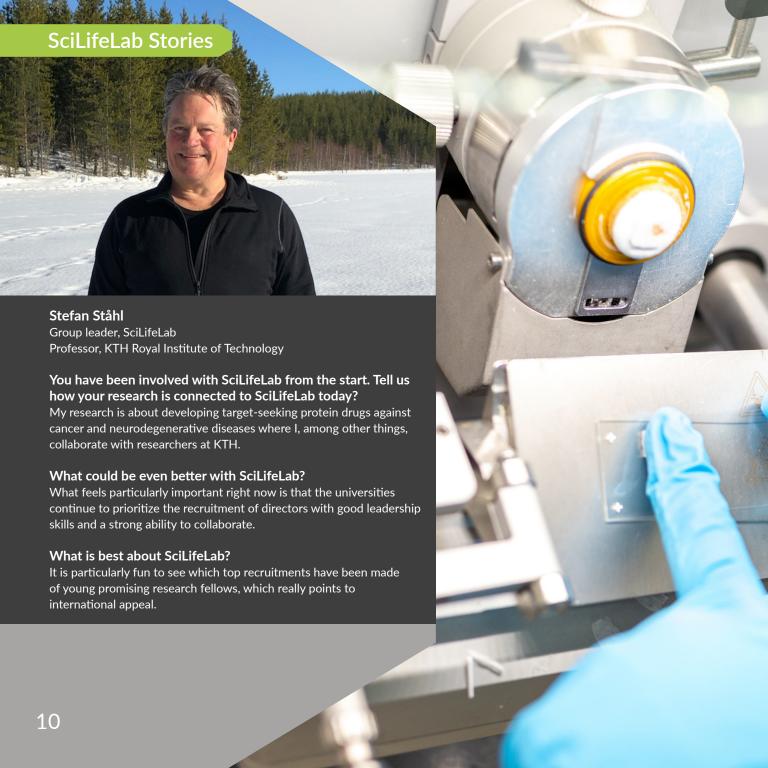
SciLifeLab Training

SciLifeLab provides advanced, data- and technology-driven research training to the Swedish life science 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 run, contributing to the upskilling of the broad research community and thereby facilitating high-level research and innovation.

To consolidate and coordinate training, the SciLifeLab Training Hub was launched in 2023. The Training Hub aims to build a system of connected services and resources, creating an openly available and FAIR training platform infrastructure that the broad life science community can use effectively. The Training Hub strives to be an inclusive community where diversity is valued and knowledge is shared, as well as to provide a co-creative and engaging environment for trainers and learners alike.











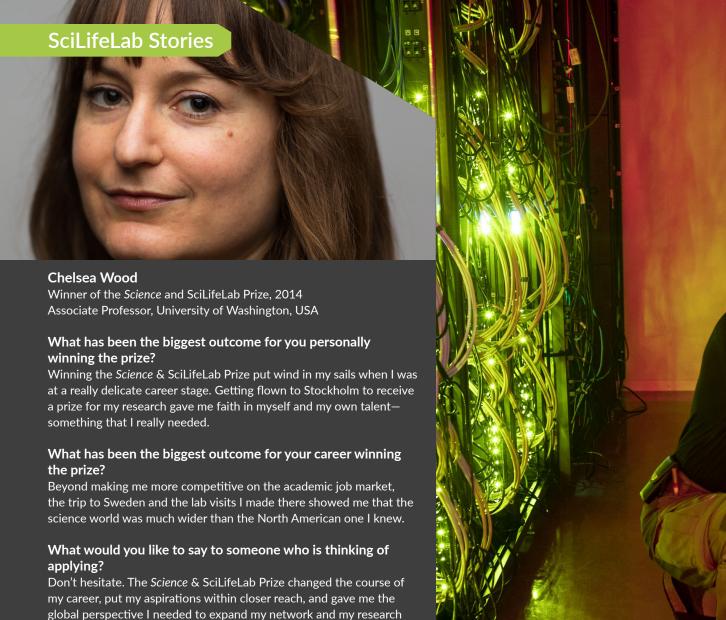
The life science area is experiencing a significant increase in data generation thanks to technological advancements that are making it exponentially easier and faster to read genomes, proteomes, and metabolites from humans and other organisms, at any scale, from entire ecosystems down to individual 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.

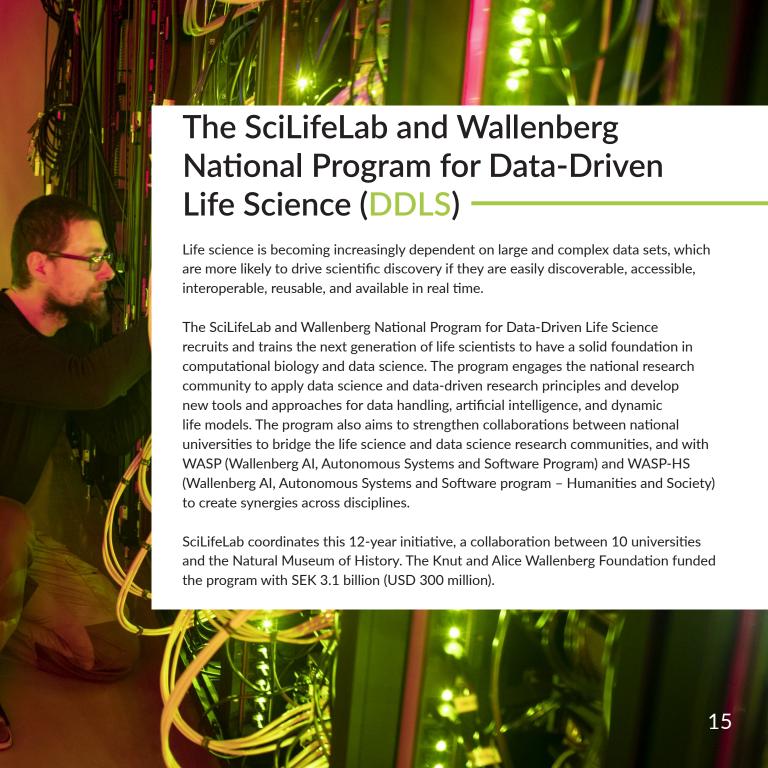
At SciLifeLab, we consider data one of our operations' most valuable and long-lasting products. We strive to ensure that our data is FAIR, handled according to open science standards, and of the greatest long-term value to the scientific community.

SciLifeLab Data Centre is a central SciLifeLab unit in charge of IT and data management issues for SciLifeLab, and, together with the SciLifeLab bioinformatics platform (NBIS), coordinates and supports data life cycle activities such as project planning and data production, analysis, sharing, publishing, and reuse.





purview.







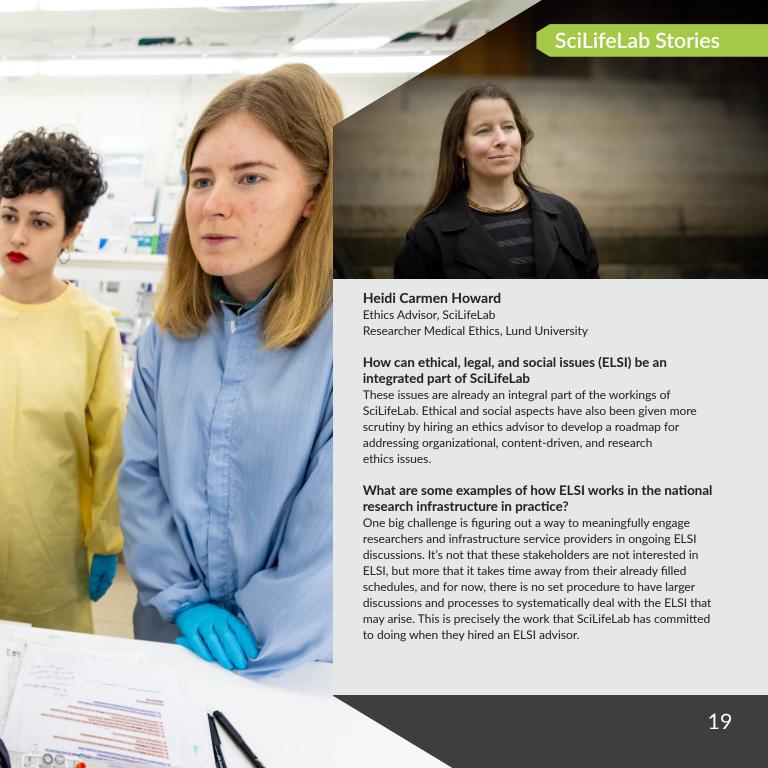
Global Collaborations

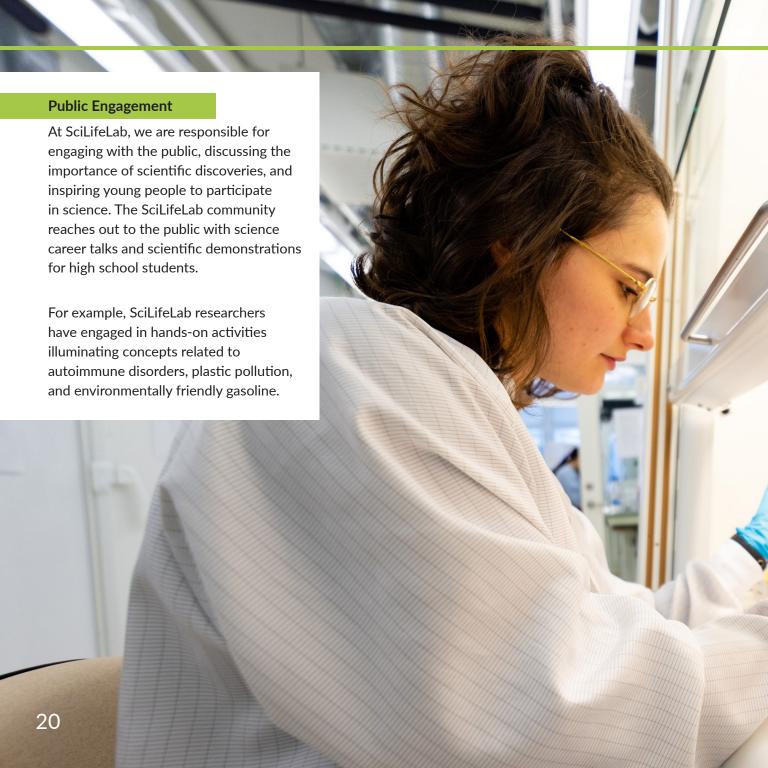
Our infrastructure provides support (see box on page seven), with the capacity to address scientific questions spanning from fundamental research to medical challenges and biodiversity research. In a single year, our infrastructure serves 1800 unique users.

Some of the most pressing challenges biological research faces today, such as preparedness for future pandemics, understanding biodiversity, preparing for the precision medicine of the future, or creating solutions to improve planetary health, require scientists to work together across countries and disciplines.

Among international collaborations of SciLifeLab is the European Molecular Biology Laboratory (EMBL), one of the world's leading research institutions and Europe's flagship laboratory for life sciences. Our joint ambition with EMBL is to stimulate mutually beneficial scientific and academic exchange and collaboration in specific areas of life science research, such as data-driven research, planetary biology and structural biology.













Planetary Biology

SciLifeLab's planetary biology capability emerged from the need for coordinated, cross-disciplinary methods to investigate life on Earth, including everything from single molecules and cells to individual species, communities, and ecosystems, using various techniques (such as imaging, microscopy, genomics, bioinformatics, metabolomics, proteomics, and big data analysis) offered by our infrastructure.

Another aspect of planetary biology is exploring how the latest advances in molecular biosciences can tackle pressing global challenges such as climate change, the biodiversity crisis, and natural resource management to sustain a growing global population. We look at environmental sciences from a biological perspective with researchers working on ecotoxicology, functional ecology, microbial interactions in aquatic environments, gene-environment interactions, and more.

Our goal is to connect molecular-scale studies, big-data research, and traditional biology. We strive to understand the biological processes underlying the decline in biodiversity and study the larger-scale effects of such processes that manifest at the level of ecosystems, biomes, and our planet.

Through the planetary biology capability, we build and empower a solid multidisciplinary research community and connect it with relevant stakeholders, funding bodies, and infrastructure. We seek to inform and educate the public about how life on Earth is influenced by global environmental change, and how biological processes may, in turn, affect the Earth system.





Precision Medicine

Precision medicine research is a rapidly growing field that recognizes disease as a unique and personal experience. Its primary goal is to gain a deeper molecular understanding of a disease and its heterogeneous manifestations and progression within one patient and between patients to create personalized medical treatments and interventions tailored to a person's unique genetic, environmental, and lifestyle factors.

Precision medicine seeks to move away from a one-size-fits-all approach to healthcare and toward developing targeted, individualized therapies that are more effective and have fewer side effects.

This approach requires close collaboration between healthcare professionals and scientists. SciLifeLab is committed to directly providing top-tier expertise and advanced technologies to hospitals, paving the way for improved diagnostics and data-driven precision medicine.

As precision medicine research navigates the complex landscape of health data, it will contribute to equitable, evidence-based healthcare that ultimately benefits patients.

Pandemic Laboratory Preparedness

The COVID-19 pandemic has had a devastating impact on society and healthcare systems all over the world, but the extraordinary speed with which the scientific community responded helped bring the pandemic under control. During a pandemic, scalable laboratory capacity is vital. Resources, knowledge, competence, and technology must be readily available and quickly shareable.

In December 2020, the Swedish government commissioned SciLifeLab to build laboratory capacity to mitigate the effects of future pandemics. We are optimizing SciLifeLab's operations to support and complement the work of other government and regulatory entities at a national and local level.

We believe pandemic preparedness can be reached through:

- Infrastructure—SciLifeLab's research infrastructure can immediately shift focus to meet societal challenges
- Research—focused on diagnostics, infection analysis, immunity, and resistance development related to viruses, bacteria, and other disease-causing organisms.
- Training—focused on sequencing, genetic analysis, immunological methods, and big data management.







A Global Search for Talent

SciLifeLab Fellows Program

The SciLifeLab Fellows Program strengthens Swedish life science research by attracting and retaining international talent in the country's academic community.

Since 2014, we have recruited more than 40 early-career, internationally recognized group leaders to come to Sweden. We offer a competitive start-up package, a robust interdisciplinary research environment, and proximity to facilities with front-line technologies.

The success of the SciLifeLab Fellows program can be seen in the amount of external research funding that the fellows have acquired: which is well over 1 billion SEK during the first 10 years of the program. This includes 18 prestigious ERC (European Research Council) grants.

A Global Search for Talent

DDLS Fellows Program

The SciLifeLab and Wallenberg National Program for Data-Driven Life Science aims to change how life science is practiced in the future and to thus equip the research community with essential future data-driven skills and capabilities. With a budget of SEK 3.1 billion (USD 300 million), the program is underway to recruit 39 future research leaders as DDLS Fellows, establish a graduate school for 260 Ph.D. students, and create 210 postdoctoral positions. The fellows will receive a generous financial package to start their research groups at one of the 10 participating universities or the Swedish Museum of Natural History.

The program focuses on four strategic areas for data-driven research:

- Cell and molecular biology
- Precision medicine and diagnostics
- Evolution and biodiversity
- Epidemiology and biology of infections







Science & SciLifeLab Prize For Young Scientists

For Young Scientists

To promote young scientists early in their careers, SciLifeLab and Science/AAAS have joined forces in creating a global prize awarding the best Ph.D. thesis work in life science. The prize recognizes early-career researchers for excellence in molecular biology, environmental research, systems biology, and translational medicine. An essay based on the thesis is submitted to the editorial board of Science, and one winner in each of the four categories is selected each year.

The best applicant is awarded a stipend of USD 30,000, while the winners of the other three categories receive USD 10,000 each. All essays are published by Science, and the winners are invited to Sweden to attend the prize ceremony. During the visit to Sweden, they present their work, participate in scientific symposiums, and attend social and networking events with prominent scientists.

The *Science* & SciLifeLab Prize For Young Scientists is made possible thanks to the generosity of the Knut and Alice Wallenberg Foundation.



