SciLifeLab
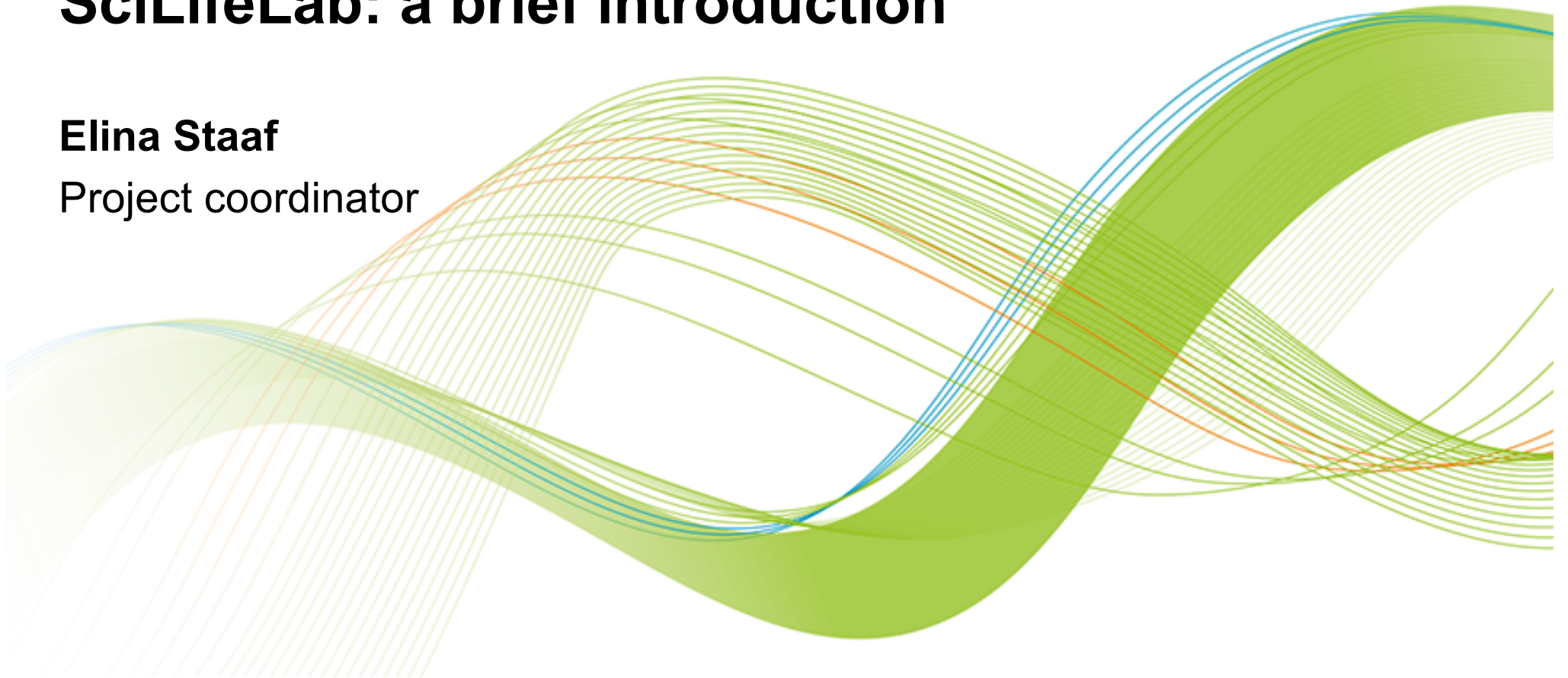
Introduction to Bioinformatics using NGS data, Jan 23-27 2017, Uppsala

SciLifeLab: a brief introduction

Elina Staaf

Project coordinator

- **4** host universities

- Established in **2010**

- National resource since **2013**
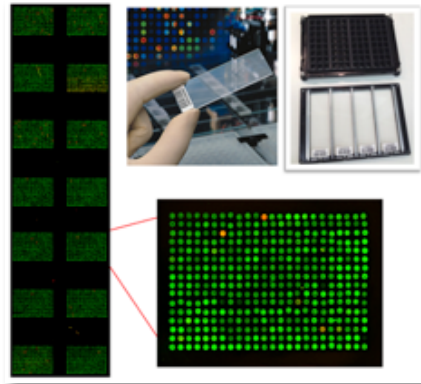
- More than **1000** researchers

Vision

To be an internationally leading center that develops, uses and provides access to advanced technologies for **molecular biosciences** with focus on health and environment
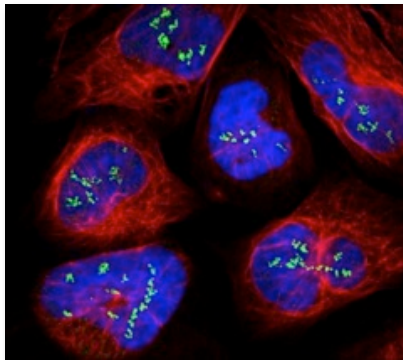
Mission

SciLifeLab

Technology platforms for national use

- Service to research community
- Technology development
- Education

Strong research community

- Strong interdisciplinary community
- SciLifeLab Fellows Program
- National projects

Society impact

- Health care outcome
- Environment
- Tech transfer, spin-offs, industry collaborations

The range of life sciences studied

Ecosystems
Communities
Populations
Organisms
Organs
Tissues
Cells
Organelles
Molecules

Platforms and facilities

SciLifeLab

Platforms & facilities

Affinity Proteomics
Autoimmunity Profiling
Biobank Profiling
Fluorescence Tissue Profiling
High-Content Microscopy
Mass Cytometry
PLA Proteomics
Tissue Profiling

Bioimaging
Advanced Light Microscopy
Fluorescence Correlation Spectroscopy

Chemical Biology Consortium Sweden
Laboratories for Chemical Biology Umeå (LCBU)
The Laboratories for Chemical Biology at Karolinska Institutet (LCBKI)
Uppsala Drug Optimization and Pharmaceutical Profiling (UDOPP)

Drug Discovery and Development
ADME (Absorption Distribution, Metabolism Excretion) of Therapeutics (UDOPP)
Biochemical and Cellular Screening
Biophysical Screening and Characterization
Human Antibody Therapeutics
In Vitro and Systems Pharmacology
Medicinal Chemistry – Hit2Lead
Medicinal Chemistry – Lead Identification
Protein Expression and Characterization

Functional Genomics
Eukaryotic Single Cell Genomics
Karolinska High Throughput Center (KHTC)
Microbial Single Cell Genomics
Single Cell Proteomics

Metabolomics
Swedish Metabolomics Centre (SMC)

National Bioinformatics Infrastructure Sweden (NBIS)
Bioinformatics Compute and Storage (UPPNEX)
Bioinformatics Long-term Support (WABI)
Bioinformatics Short-term Support and Infrastructure (BILS)
Systems Biology

National Genomics Infrastructure
NGI Stockholm (Genomics Applications Development)
NGI Stockholm (Genomics Production)
NGI Uppsala (SNP&SEQ Technology Platform)
NGI Uppsala (Uppsala Genome Center)

Next-Generation Diagnostics (NGD)
Clinical Biomarkers
Clinical Genomics
Clinical Sequencing
Integrative Clinical Genomics
Translational and Clinical Genomics

Structural Biology
Cryo-EM
Protein Science Facility
Swedish NMR Centre (SNC)

New facilities from 2017
BioImage Informatics
Genome Engineering Zebrafish

Pilot facilities & projects

Pilot facilities & projects

Nodes and sites

Umeå

Göteborg

Linköping

Lund

Uppsala node

Stockholm node (Solna)

Platforms and facilities

SciLifeLab

Platforms & facilities

Affinity Proteomics
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Pilot facilities & projects
Pilot facilities & projects

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www.nbis.se

Why bioinformatics infrastructure?

A continuous technical scale-up will provide an unprecedented amount of heterogeneous omics data
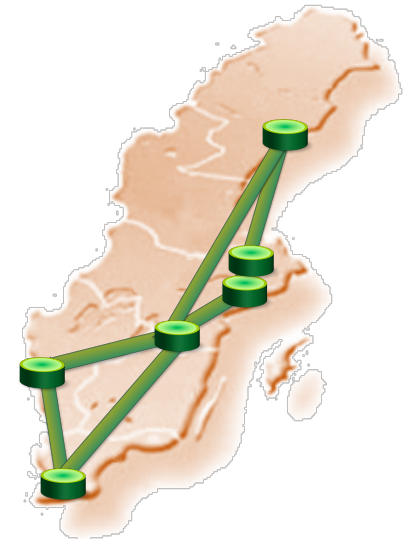- Support, Tools, Training

System-level analyses in biomedical research will transform life science
- Strategic positioning in systems biology

Large-scale omics is will make a major leap into translational research and diagnostics
- Method adaptation and expert advice

User access to NBIS

- Study design consultation (free)
- Short & medium-term support
- 8 hours for free, then 800 SEK/hour
- http://www.nbis.se/support/supportform/index.php
- Apply anytime

- Long-term support (500h; free: scientific evaluation)
  http://www.scilifelab.se/facilities/wabi/
- Next deadline: **January 27**

- Compute and storage (free; majority of hardware
  and system administration belongs to SNIC)
- Apply: https://supr.snic.se
- Read more: http://www.uppmax.uu.se/

Bioinformatics Drop-In

- Are you planning a project and need someone to discuss the bioinformatics analysis with?
- Do you need bioinformatics support, but do not know who to turn to?
- Are you stuck in your own bioinformatics project and need help?
- Meet the NBIS staff at bioinformatics drop-in

Uppsala
When: Weekly on Thursdays at 10-11 am
Where: SciLifeLab, level 3

Stockholm
When: Weekly on Tuesdays at 10.30-11.30 am
Where: SciLifeLab, gamma, level 6

- Similar activities in the other NBIS nodes/cities

Upcoming courses spring 2017

Date	Course
January 23-27	Introduction to Bioinformatics using NGS data
February 6-10	Python programming with applications to Bioinformatics
October 25-27	RNA-seq
March 27-31	R Programming Foundations for Life Scientists
May 9-11	Introduction to Genome Annotation
May 15-19	Introduction to Bioinformatics using NGS data, Göteborg
Application Nov/Dec	The Swedish Bioinformatics Advisory Program

See also: https://www.scilifelab.se/education/courses/

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The Swedish Bioinformatics Advisory Program

SciLifeLab

A new teaching model, where PhD students get a senior bioinformatician as a personal advisor during 2 years of their PhD.

Monthly project meetings + two grand meetings per year to aid networking and knowledge transfer.

First call late 2014:
>50 applicants for 15 places
Last call in 2016
>111 applicants for 18 places

www.scilifelab.se/education/mentorship/the-swedish-bioinformatics-advisory-program/

Next call Nov-December 2017

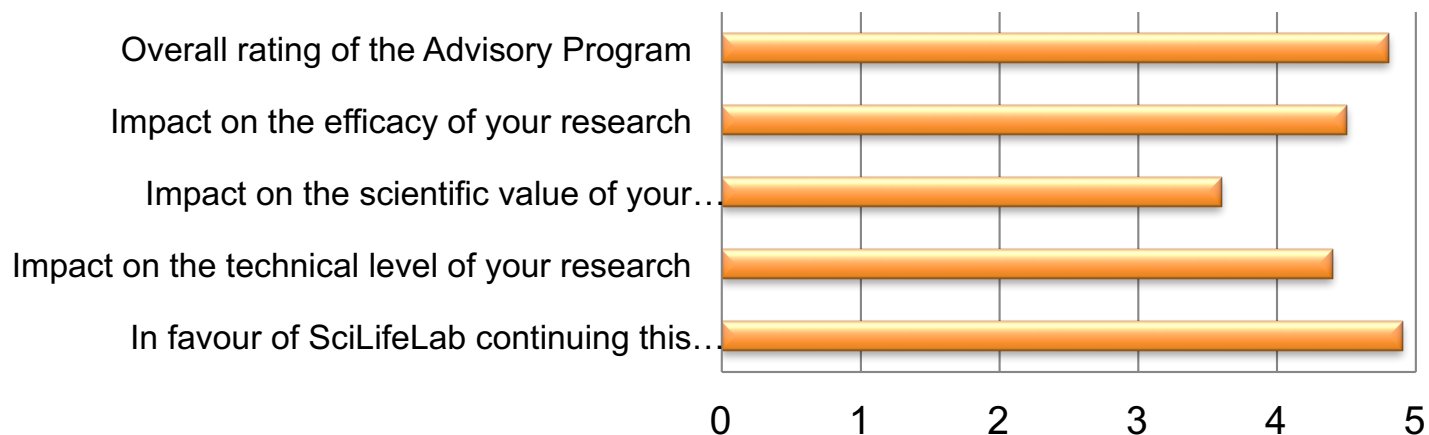# Why this program

Overall aim: Great research in Sweden!

How?   Strategic investment in PhD education
          Complementing PhD supervisors with technical expertise
          Catalyze transition to large-scale data analyses

The PhD student is responsible to prepare and drive the meetings!

The Swedish Bioinformatics Advisory Program

Student evaluation, June 2015

Science & SciLifeLab Prize

- A grand prize winner receives a prize of US $30,000; and each of the three category winners will receive US $10,000

- The grand prize winning essay will be published in *Science* and essays from the three category winners will be published online

"to incent our best and brightest to continue in their chosen fields of research"