Description of de.NBI-epi

The de.NBI-epi project in Freiburg offers:

Visualization, normalization and quality assessment:
• Hi-C data analysis
• MethylC-Seq data analysis
• ChIP-Seq
• Bisulfite sequencing analysis pipelines

Training and user support:
• Galaxy HTS data analysis workshops
• Self learning material on https://training.galaxyproject.org
• Direct user support via git@, GitHub or to visit as a guest researcher

Flexible availability:
• All in one Gateway: https://usegalaxy.eu
• Your computer with virtualized and personalized instances

General information on the project

As part of the de.NBI-epi project in Freiburg, Joachim Wolff and Björn Grüning, are working closely with the RBC, de.NBI, ELIXIR and EOSC-life to deliver high-class services for epigenetic research.

General information on the project

Community based infrastructure

BIOCONDA

Biolonda is a conda channel which provides software for biomedical research.

• 25,649 commits on GitHub
• 856 contributors
• >7,300 packages

Biocontainers

BioContainers provides system-agnostic executable environments for bioinformatics software.

• Based on Docker & rkt
• >33,000 containers
• Automatic builds from Bioconda

Galaxy

Galaxy is an open, web-based platform for data intensive research.

• 43,998 commits
• 223 contributors
• One of the biggest Galaxy instances available for de.NBI in Freiburg

The Galaxy Docker Project

The Galaxy Docker Image is an easily distributable full-fledged Galaxy installation, that can be used for testing, teaching and presenting new tools and features.

Portable data analysis in a box!

Based on the main Galaxy Docker virtualization, a dedicated flavor for epigenetics has been developed: github.com/bgruening/docker-galaxy-epigenetic

Publications

Software engineering for scientific big data analysis
doi:10.1007/s10499-004-3007-0

The de.NBI/ELIXIR-DE training platform Bioinformatics training in Germany and across Europe within ELIXIR
doi:10.26870/Research20241.1

The Bioconda registry of software tools and data resources for the life sciences
doi:10.1101/02659-19-17724-4

RNA Bioinformatics Center
University of Freiburg
Chair of Bioinformatics

Björn Grüning, Joachim Wolff
University of Freiburg, Germany

de.NBI services

Maintenance, development and integration of software into Galaxy to provide easy access for epigenetic analysis software:

• deepTools
• Bismark
• HICUP
• CHI.CAGO
• Methylation
• Methtools
• scHiCExplorer
• Galaxy
  • Container: Docker, rkt, Singularity

Progress report

Development and maintenance of software for Hi-C data analysis.

HiCExplorer:
• Maintenance of HiCExplorer
  • Extending available tools with new functions
  • Loop detection
  • Support of more file formats
  • Support of ChIC data analysis
  • Validation of loops
  • Improved training material: https://hicexplorer.readthedocs.io

scHiCExplorer:
New software to support single-cell Hi-C data analysis:
- Tools to demultiplex raw fastq files
- Create mCool matrices and manipulation
- Methods for dimensionality reduction of scHiC data
- Methods to cluster scHiC data

de.NBI Training and education

Hands-on training material for self-study available on training.galaxyproject.org

• Introduction to HTS
• RNA-Seq
• ChIP-Seq
• Proteomics
• MethylC-Seq
• ...and many more!

2018 / 2019 past events

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>06th – 07th Dec 2018</td>
<td>Galaxy RNA-Seq analysis workshop</td>
<td>Freiburg</td>
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<tr>
<td>17th – 18th Jan 2019</td>
<td>Galaxy RNA-Seq analysis workshop</td>
<td>Belgrad, SP</td>
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<tr>
<td>25th Feb – 01st Mar 2019</td>
<td>Galaxy Workshop</td>
<td>Freiburg</td>
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<td>23rd – 26th Apr 2019</td>
<td>Elixir Galaxy Community Workshop</td>
<td>Roscoff, FR</td>
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<td>19th – 6th Jul 2019</td>
<td>Host of Galaxy Community Conference (GCC)</td>
<td>Freiburg</td>
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<tr>
<td>24th Jul 2019</td>
<td>ISMB: Workshop for reproducible research</td>
<td>Basel, CH</td>
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<tr>
<td>16th Sept 2019</td>
<td>GCB: Workshop for Workflows, tools and Data Management</td>
<td>Heidelberg</td>
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<tr>
<td>23rd – 27th Sept 2019</td>
<td>Galaxy Workshop</td>
<td>Freiburg</td>
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