

RBC-FR

RNA Bioinformatics Center

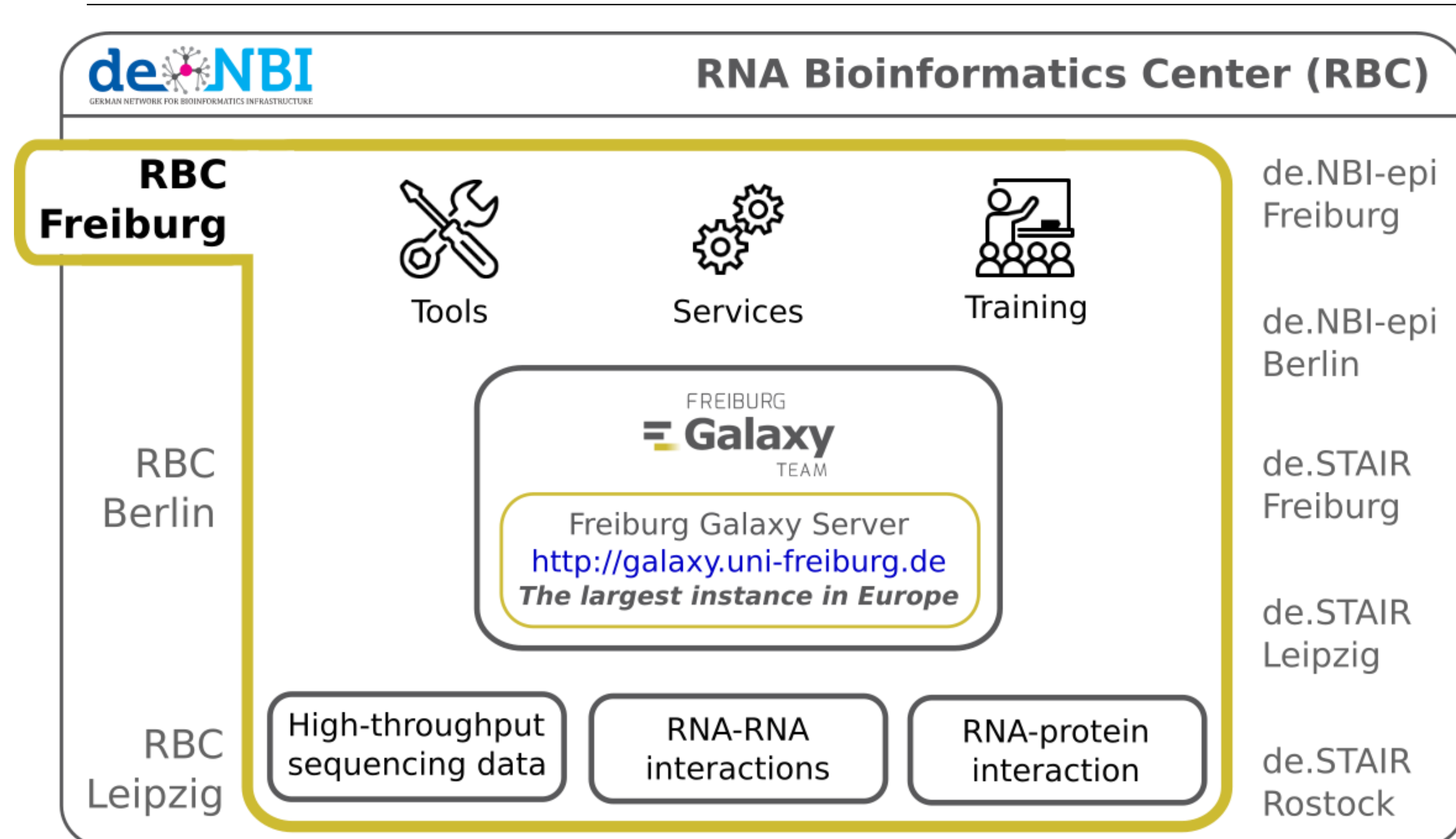
University of Freiburg

Chair of Bioinformatics

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Description of de.NBI-RBC



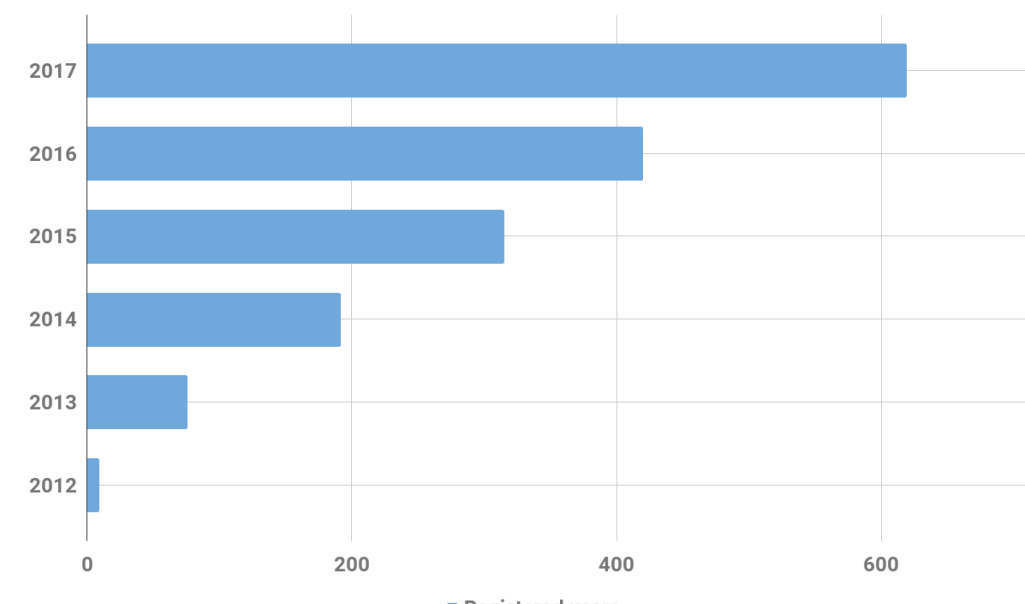
General information on the project

As part of the RBC project in Freiburg, Anika Erxleben, Torsten Houwaart, Bérénice Batut and our Cloud-Admin Eric Rasche, are working closely together with other de.NBI partners and ELIXIR to deliver high-class services for RNA-related research.

de.NBI services



The Freiburg Galaxy Server (<https://galaxy.uni-freiburg.de>) enables scientists to perform accessible, reproducible and transparent research of biomedical data. As part of the de.NBI cloud, the Freiburg Galaxy Server will be available for all German research facilities in the beginning of 2018.



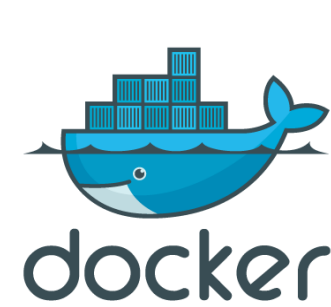
BIOCONDA

The RBC Freiburg is actively involved in making software user-accessible. Tools relevant for HTS data analysis, RNA-protein interaction analysis (e.g. CLIP experiments), RNA-RNA interaction analysis are made available through distribution channels such as Bioconda.

Freiburg RNA Tools

The Freiburg RNA server (<http://rna.informatik.uni-freiburg.de>) offers a series of RNA research tools:

- Sequence-structure alignments: LocARNA, CARNA, MARNA
- Clustering: ExpaRNA
- Interaction prediction: IntaRNA, CopraRNA
- Homolog identification: GLASSgo
- Sequence design: AntaRNA, INFORNA, SECISDesign
- CRISPR repeat analyses: CRISPRmap



Analysis frameworks for specific tasks are made available as Docker images. They incorporate a Galaxy web server with seamlessly included tools, SOP analysis pipelines, training material, a Galaxy interactive tour, and help pages.

Publications

- Tools and data services registry: a community effort to document bioinformatics resources.
- The Galaxy platform for accessible, reproducible and collaborative biomedical analyses: 2016 update.
- The RNA workbench: best practices for RNA and high-throughput sequencing bioinformatics in Galaxy
- Enhancing pre-defined workflows with ad hoc analytics using Galaxy, Docker and Jupyter.
- Global RNA recognition patterns of post-transcriptional regulators Hfq and CsrA revealed by UV crosslinking in vivo.
- RC3H1 post-transcriptionally regulates A20 mRNA and modulates the activity of the IKK/NF-kappaB pathway.

de.NBI cloud activities

- ELIXIR AAI workshop in Freiburg
- Production-ready OpenStack instance
- Monitoring via Zabbix and Grafana of Hardware and Software
- Preconfigured, packer-based, virtual appliance
- Galaxy Cloud integration
- CloudLaunch integration

Progress report

Training and education

- Organisation of
 - Several training courses to teach users common HTS techniques, tool development, and Galaxy implementation
 - Contribution fests to make software more readily available
- Migration of our training material and analysis workflow documentation to online repositories for easier collaboration: training.galaxyproject.org
- Ongoing curation and development of training material for newer tool versions and new emerging techniques requested by users
- Active participation in the Biostars forum to answer user questions

Services

- Ongoing evaluation of new analysis techniques, methods and software for RNA-RNA and RNA-protein interactions
- Development and maintenance of standard analysis pipelines and definition of SOPs

Close cooperation and knowledge exchange with ELIXIR.

de.NBI training and education

The RBC Freiburg offers biannual full-day hands-on Galaxy training weeks on HTS data analysis: >300 participants in the last 3 years.



Freiburg Galaxy HTS data analysis workshops February (left) and September 2016 (right)

We also offered Galaxy developer workshops in cooperation with ELIXIR and we organised several contribution fests.

2015/2016 events

8 hackathons and 12 workshops

2017 events

09th – 10th Jan	Galaxy QIIME codefest	Online
16th – 19th Jan	European Galaxy developer workshop	Strasbourg
26th – 27th Jan	Galaxy RNA Seq & admin workshop	Mainz
02nd – 09th Feb	Galaxy Australasia Meeting workshop	Melbourne
13th – 17th Feb	Galaxy HTS data analysis workshop	Freiburg
09th – 10th Mar	Software Carpentry workshop	Freiburg
15th Mar	ELIXIR webinar	online
21st – 22th Mar	ELIXIR IAA hackathon	Freiburg
04th – 05th Apr	AAI workshop	Freiburg
22nd – 24th May	ELIXIR Galaxy Training hackathon	Cambridge
01st – 02nd Jun	Repro hackathon	Gif-sur-Yvette
28th – 29th Jun	GCC workshops (4)	Montpellier
21st Jul	ISMB/ECCB workshop	Prag

2017/2018 planned events

18th – 22nd Sep	Galaxy HTS data analysis workshop	Freiburg
25th – 29th Sep	de.NBI Summer School workshops	Berlin
9th – 11th Oct	BioContainers hackathon	Paris
18th – 20th Oct	Software Carpentry workshop	Heidelberg
08th – 12th Jan	Galaxy admin workshop	Oslo
19th – 23th Feb	Galaxy HTS data analysis workshop	Freiburg