

SABIO-RK: CURATED KINETIC DATA OF BIOCHEMICAL REACTIONS

Ulrike Wittig, Renate Kania, Martin Golebiewski, Andreas Weidemann, Olga Krebs, Saqib Mir, Henriette Engelken, Heidrun Sauer-Danzwith, Wolfgang Mueller, Isabel Rojas

*Scientific Databases and Visualization Group, EML Research gGmbH,
Schloss-Wolfsbrunnenweg 33, 69118 Heidelberg, Germany
Ulrike.Wittig@eml-r.villa-bosch.de*

SABIO-RK (<http://sabio.villa-bosch.de/SABIORK/>) is a curated, web-accessible database for modellers and wet-lab scientists to get comprehensive information about biochemical reactions and their kinetic properties. It integrates data from different origin in order to facilitate the access to reaction kinetics data and corresponding information. Since most of the kinetic data is exclusively found in the literature SABIO-RK offers data manually extracted from the literature and related information obtained from other publicly available biological databases. For instance, the kinetic data are related to reactions, organisms, tissues and cellular locations. The type of the kinetic mechanism and corresponding rate equations are presented together with their parameters and experimental conditions. Additionally, SABIO-RK also includes data about the detailed mechanism for some of the reactions based on literature information. This not only includes the graphical representation of the mechanism but also the single reaction steps with their corresponding kinetic data.

The data in SABIO-RK are extracted manually from literature and the selection of articles is not restricted to any biological source (e.g. organisms or organism classifications). All the data are curated and annotated by biological experts using a web-based input interface. To support the curation process and data integration we have implemented different constraints in the input interface and offer several controlled vocabularies as lists of values, as well as additional semi-automatic consistency checks to avoid errors and inconsistencies in the database. Controlled vocabularies and annotations to external resources and ontologies were used to identify and relate the data to their biological context. All these efforts to unify and integrate the data augment the content and the semantics of the SABIO-RK database entries to enable a comprehensive understanding and comparison of the data for the user.

SABIO-RK can be accessed via a web-based user interface or via web-services. The user interface allows the definition of complex queries by specifying reactions and reaction participants, kinetic parameters, environmental conditions or literature sources. Links to other databases based on the annotations of the data enable the user to gather further information for example for compounds, reactions or proteins. Selected data about reactions and their kinetics, together with their annotations, can be exported in SBML (Systems Biology Mark-up Language), a widely used standard exchange format in systems biology.