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www.reactome.org

Reactome - a knowledgebase of human biological pathways

Bijay Jassal[1], Esther E Schmidt[1], Guanming Wu[2,4], Imre Vastrik[1], David Croft[1], Bernard de Bono[1], Gopal Gopinath[2], Marc Gillespie[2,4], Steven Jupe[1], Gavin O'Kelly[1], Lisa Matthews[3], Phani V Garapati[1], Michael Caudy[2,4], Alexander Kanapin[2,4], Bruce May[2,4], Shahana Mahajan[3], Ewan Birney[1], Peter D'Eustachio[3], Lincoln Stein[2,4]

[1]European Bioinformatics Institute, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SD, United Kingdom
[2]Cold Spring Harbor Laboratory, 1 Bungtown Road, Cold Spring Harbor NY 11724, USA
[3]NYU School of Medicine, 550 First Avenue, New York NY 10016, USA
[4]OICR 101 College St., Suite 800, Toronto, ON, Canada M5G0A3

Abstract
Reactome is a manually curated knowledgebase, created and peer-reviewed by experts in their field. Its robust data model describes life processes ranging from metabolism to signal transduction and the cell cycle. Data is cross-referenced to publicly available web-based informatics resources. Reactome features the SkyPainter tool for analysis of high-throughput datasets, and the Mart query and data retrieval tool. All data are freely available and can be exported in a number of data formats.
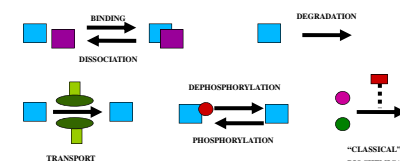
Stats
April 09

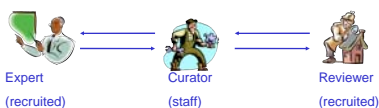3700 proteins

3200 reactions

960 pathways

Reactions captured

• Basic "unit" of Reactome
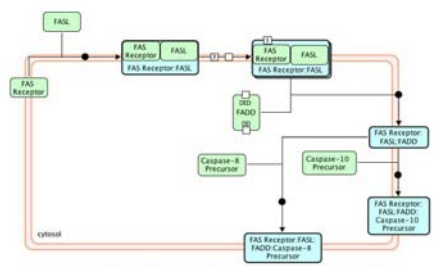
• Encapsulates many events and states found in biology
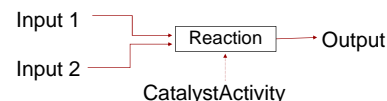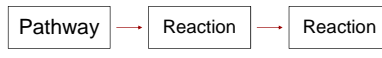

Where Reactome's Data Comes From

Expert (recruited) → Curator (staff) → Reviewer (recruited)

• Expert and curator create outline of new pathway
• Expert provides the biological information
• Curator enters information into database
• Reviewer (another expert) checks biological correctness

Visualization based on SBGN

Reactome Data Model

Topics

• Apoptosis
• Cell cycle
• DNA repair
• Transcription, mRNA processing, translation, post-translational modification
• Signaling pathways (insulin, NOTCH, opioid, NGF, EGFR, FGFR, Rho GTPases II)
• Hemostasis
• Metabolism (energy, amino acid, lipid, nucleotide, xenobiotic)
• HIV and Influenza lifecycles
• Neurotoxicity of botulinum toxins
• and more...

SkyPainter

Reactome Frontpage With Interactive Reaction Map and Eventbrowser Pages

The Reactome frontpage features an interactive reaction map and serves as entry portal to the Eventbrowser pages, allowing the user to drill down to more detailed pages.

Reactome Resources

• mysql database dump
• SBML
• BioPAX level 2
• PDF/RTF "Textbook"
• "Interaction" and ID mapping files
• Local installation
• Author- and curator-tools
• SOAP based webservices
• SVG
• List of participants

Reactome Mart

• Query submission and data retrieval
• Canned queries
• Various output formats (HTML, TSV, XLS)
• Combined queries across UniProt, Ensembl, Wormbase and PRIDE BioMarts

Human versus other species

• Manual curation focus on human
• Electronic inference to 22 other species based on orthology data from OrthoMCL
• Cross-species comparison webpage

Bijay Jassal
bj1@ebi.ac.uk

EMBL- EBI
Wellcome Trust Genome Campus
Hinxton
Cambridge
CB10 1SD
UK

T +44 (0) 1223 494 444
F +44 (0) 1223 494 468
http://www.ebi.ac.uk