

Minutes of Breakout session 2: Data Sharing and Standards

The discussion revolved around the utility of current resources for establishing a Gene Regulatory Knowledge Community.

We considered following features important for judging the utility of data resources:

- Standards: Is the data provided according to a standard?
- Accessibility: Are the data easily accessible through API, PSICQUIC, Cytoscape plugin, etc

During the discussion, we focused on data resources for molecular signaling and to a lesser extent gene regulation on gene/chromosomal level.

Resources for signaling:

Resource	Accessibility/API	Comments
Signor https://signor.uniroma2.it/	Accessible through API (https://signor.uniroma2.it/APIs.php) PSICQUIC version 1.1 (when released)	
Intact https://www.ebi.ac.uk/intact/	accessible through PSICQUIC 1.0 (also 1.1 when released but need to re-engineer data to fully use	Protein binds to gene' info needs to be structured before it can be shared through PSICQUIC 1.1
Reactome https://reactome.org/	provides a 'PSICQUIC dump', retrieved as a set of binary interactions/protein pairs	
KEGG https://www.kegg.jp/	KEGG API: https://www.kegg.jp/kegg/rest/keggapi.html Cytoscape app (KEGGscape) parses KEGGML files for chosen pathways	Status uncertain
Signalink2 http://signalink.org	Mentions on webpage of PSICQUIC interface for future (http://signalink.org/faq)	data not yet updated to CausalTAB, could be Signalink3.0?
STRING https://string-db.org	Provides several types of API (https://string-db.org/cgi/access.pl?footer_active_subpage=apis) and cytoscape App	
BIOGRID https://wiki.thebiogrid.org	Rest service + cytoscape app	probably difficult to communicate/negotiate with

OmniPath http://omnipathdb.org/	downloadable, queryable with Python, Cytoscape plugin, Rpackage.	Internal standard?
GO/NOCTUA http://noctua.geneontology.org/	API available, extraction of GO - Causal Activity Models (https://geneontology.cloud/home)	GOA - annotation extensions would need to be dealt with —> through GO-CAM Be able to query gene partners (based on info from the 'with' column) using QuickGO

Note: PSI-MI has authority over the PSICQUIC webservice

Resources for gene regulatory mechanisms

Resource	Accessibility/API	Comments
ENSEMBL https://www.ensembl.org/	provides regulatory genome annotations, accessibility through REST https://rest.ensembl.org/ or through Biomart https://www.ensembl.org/biomart/	
USCS Genome Browser https://genome.ucsc.edu	tracks for HI-C data	
UniBind https://unibind.uio.no	REST API	

Conclusion: While there exists a large diversity of data resources for molecular signaling and gene regulation, the use of data standards remains frequently unclear hindering swift integration or application.