HyQue: A Semantic Web tool for evaluating scientific hypotheses

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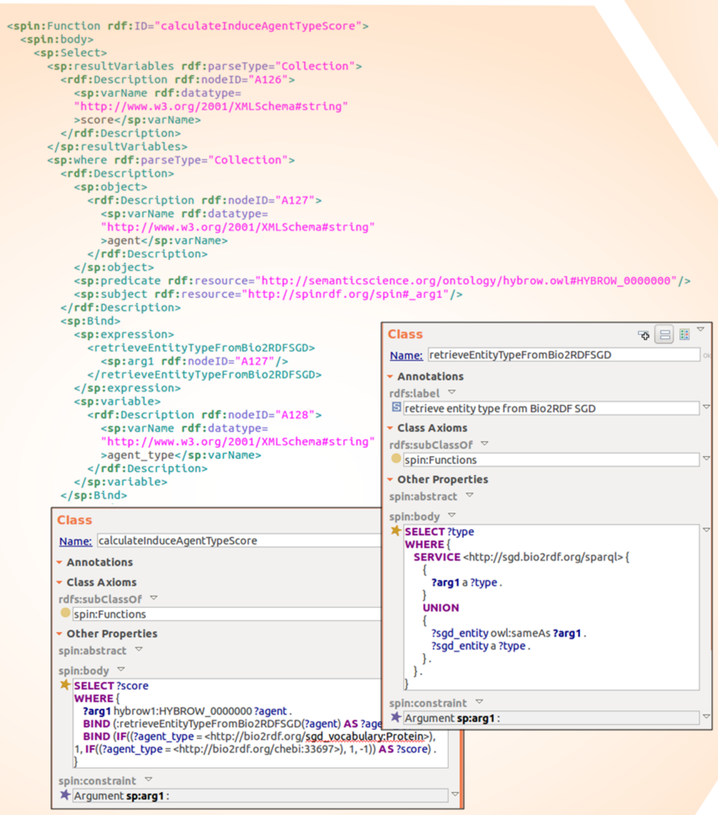
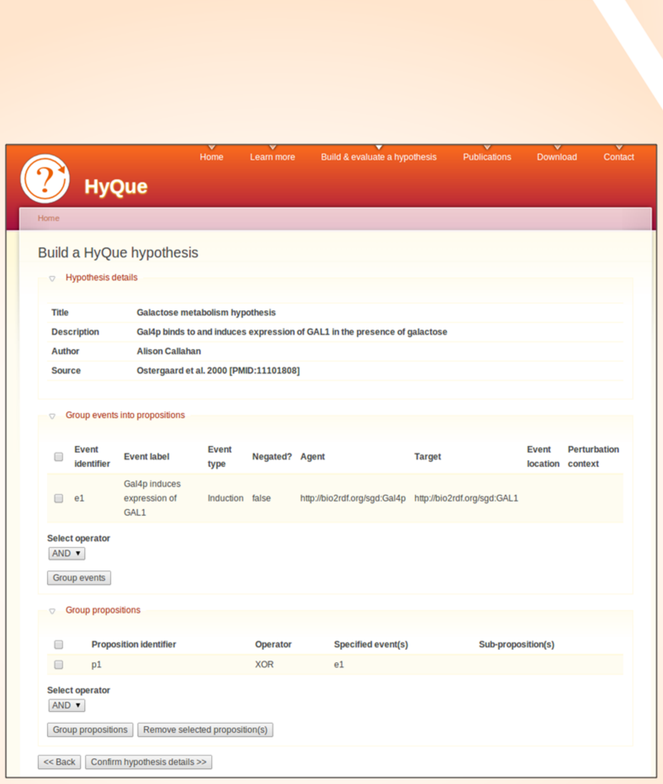
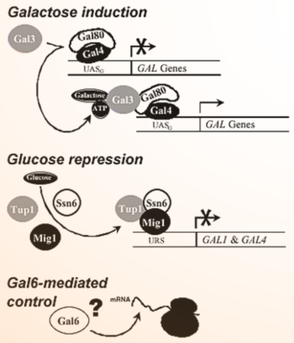


HyQue data retrieval and evaluation rules are written in the SPARQL Inferencing Notation (SPIN). SPIN rules can executed using a reasoner, and also published as linked data and queried using SPARQL.



HyQue users can formulate hypotheses online and submit them for evaluation. If users are familiar with RDF they can also download the RDF serialization of their hypothesis and its evaluation.



Source: Ostergaard S, Olsson L, Johnston M, Nielsen J. 2000. Increasing galactose consumption by Saccharomyces cerevisiae through metabolic engineering of the GAL gene regulatory network. *Nature Biotechnology* 18(12):1283-6.

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@prefix hyp: <http://bio2rdf.org/hyqueData:hypothesis1_> .
@prefix hyque: <http://semanticscience.org/ontology/hyque.owl#> .
@prefix hybrow: <http://semanticscience.org/ontology/hybrow.owl#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

hyp:h a hyque:HYPOTHESIS_0000000 ;
  hyque:HYPOTHESIS_0000010 hyp:p0 .

hyp:p0 a hyque:HYPOTHESIS_0000014 ;
  hyque:HYPOTHESIS_0000012 hyp:e1 .

hyp:e1 a hyque:HYPOTHESIS_0000004 ;
  a <http://bio2rdf.org/go:0010628> ;
  hybrow:HYBROW_0000000 <http://bio2rdf.org/sgd:Gal4p>;
  hybrow:HYBROW_0000001 <http://bio2rdf.org/sgd:GAL1> ;
  hybrow:HYBROW_0000003 "0"^^xsd:boolean .
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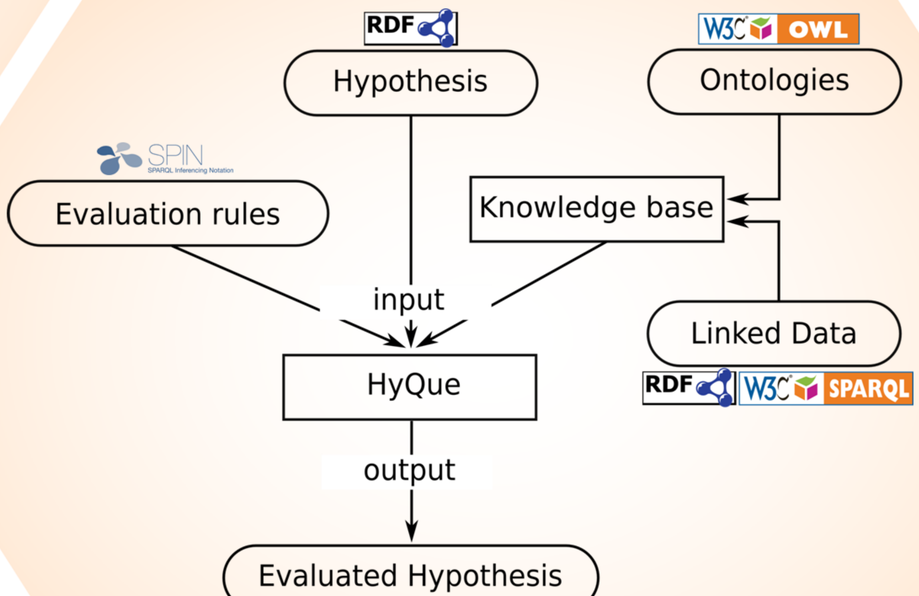
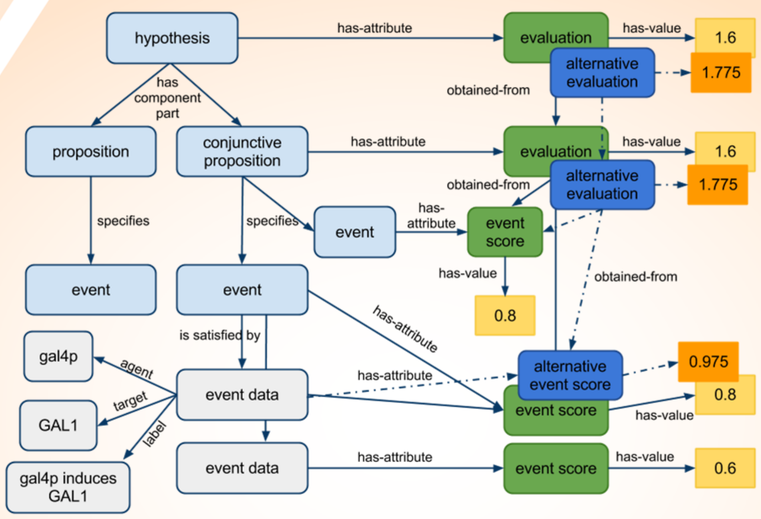
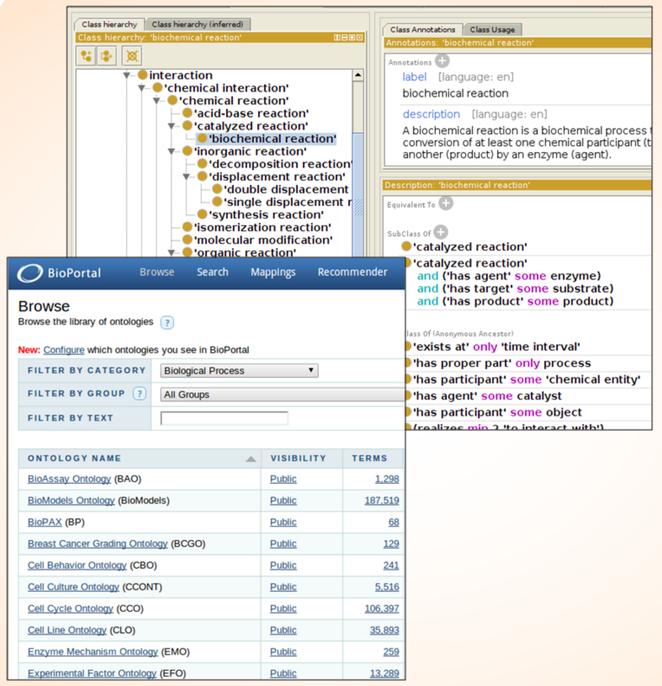
HyQue can evaluate hypotheses about biological events. The hypothesis shown above is that the protein Gal4p induces expression of the gene GAL1.



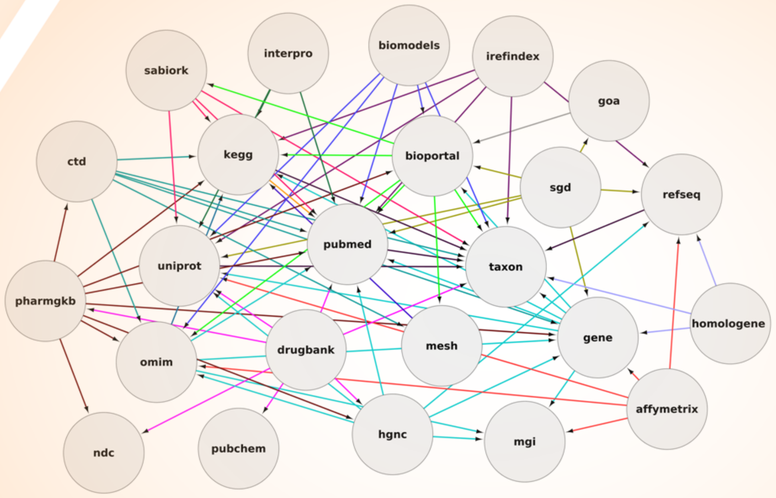
HyQue uses SPIN rules to evaluate a hypothesis over Bio2RDF linked data and bio-ontologies. Hypotheses, data, ontologies, evaluation rules, and evaluation are all serialized using Semantic Web standards (RDF/OWL).



HyQue evaluations are automatically linked to both the input hypothesis and the data used to generate the evaluation. As a result it is possible to follow the path from a hypothesis to its supporting data and *vice versa*.



HyQue uses bio-ontologies collected and maintained by the National Center for Biomedical Ontology (NCBO) to describe hypothesis details including event type, location and the biological function of event participants.



BIO2RDF

HyQue leverages Bio2RDF, a growing network of linked data for the life sciences, to gather data that supports or refutes a hypothesis.

Carleton UNIVERSITY

http://hyque.semanticscience.org

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