PSICQUIC

The PSI Common QUery Interface

Interesting facts

pronounced “psykick”, but also known as “pisquick”

spelled in 40 different ways (PSIQUIC, PSICIQK, QPSICUI…)

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About me

- Name: **Bruno Aranda**
- Affiliation: **European Bioinformatics Institute (EBI)**
- Role: **Software Engineer** at the **IntAct Team**

- **IntAct** provides **Molecular Interaction** data through its **open source services and tools.**

- One of such tools is **PSICQUIC.**

Take a deep breath

INTRODUCTION

Bruno Aranda (baranda@ebi.ac.uk)

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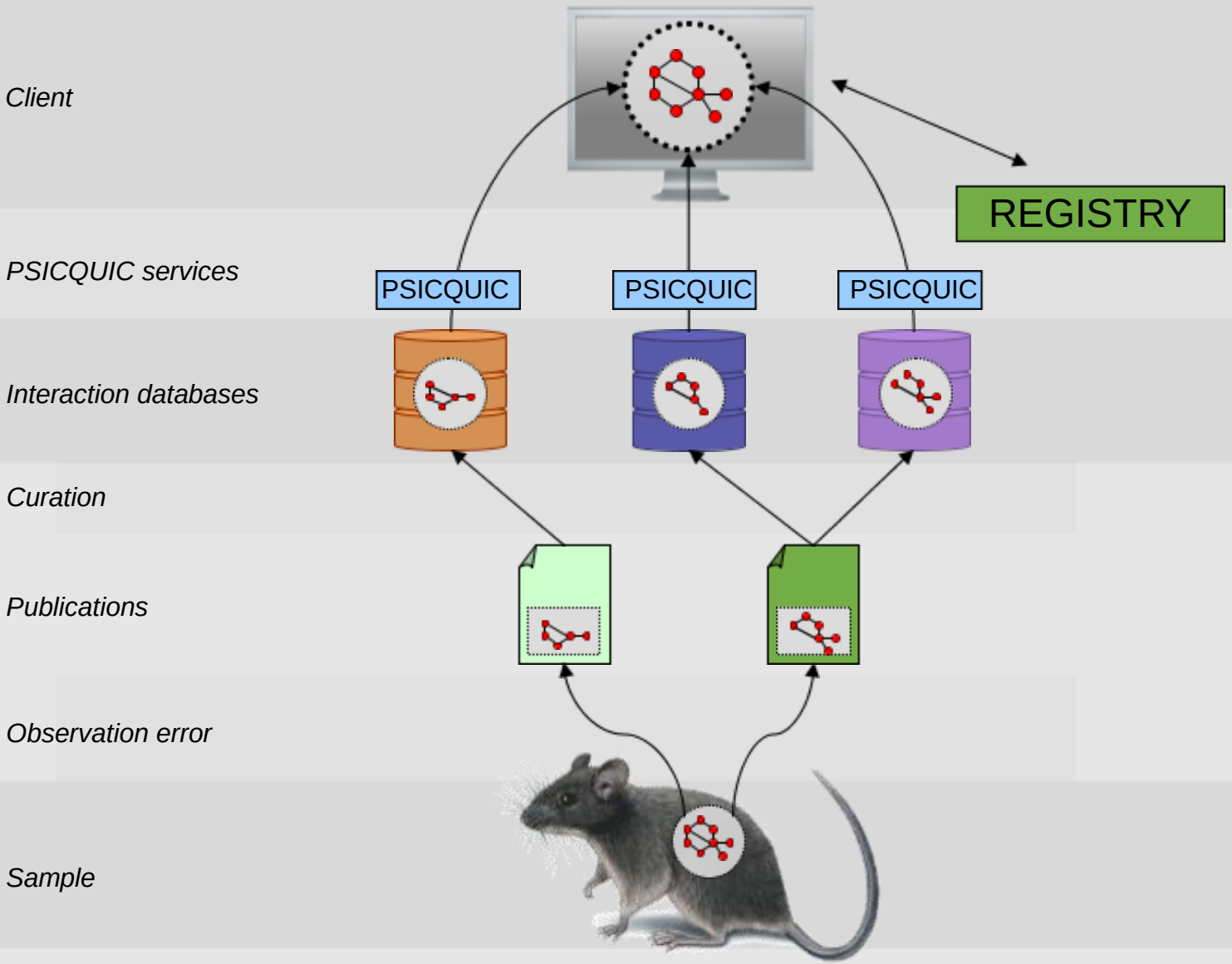
What is PSICQUIC?



What is PSICQUIC?

- **P**roteomics **S**tandards **I**nitiative **C**ommon **QU**ery **I**nterfa**C**e.
- Community effort to standardise the way to access and retrieve data from Molecular Interaction databases.
- PSICQUIC is a specification of a **web service**.
- Resources already implementing PSICQUIC are listed in a **registry**.
- Based on the PSI standard formats (PSI-MI XML and MITAB)
- Documentation: ***http://psicquic.googlecode.com***

Justification

- So basically, if all interaction databases provide data in the same way, we can have…

“The one Client to rule them all”

228,262

74,861

MatrixDB

845

STRING

12,231,763

J. Craig Venter INSTITUTE

24,268

404,453

More than **14 million** binary interactions available using **PSICQUIC**

innateDB

9,909

MINT

124,473

chEMBL

581,858

20,769

BioGRID

337,957

APID

416,124

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What can I do?

METHODS

Web Service Methods

- getByInteraction
  Retrieves interactions by using an interaction AC.
- getByInteractionList
  Retrieves interactions by using a list of interaction AC.
- getByInteractor
  Retrieves interactions by using a participant identifier.
- getByInteractorList
  Retrieves interactions by using a list of participant identifiers.
- getByQuery
  Retrieves interactions by using a Molecular Interaction Query Language (MIQL) query (full text searches)

Web Service Methods

Other metadata methods:

- getVersion
  Returns the version of the web service implementation.
- getSupportedDbAcs
  Returns the supported database identifiers
- getSupportedReturnTypes
  Returns the list of available format types for the results.

- A limited number of interactions can be fetched. It is possible to retrieve large datasets using **pagination**. Most methods have two additional parameters:
  - *First result*: Index for the first result to retrieve.
  - *Max results*: Number of interactions returned per query.

Take a shower before going to sleep?

SOAP AND REST (PROTOCOLS)

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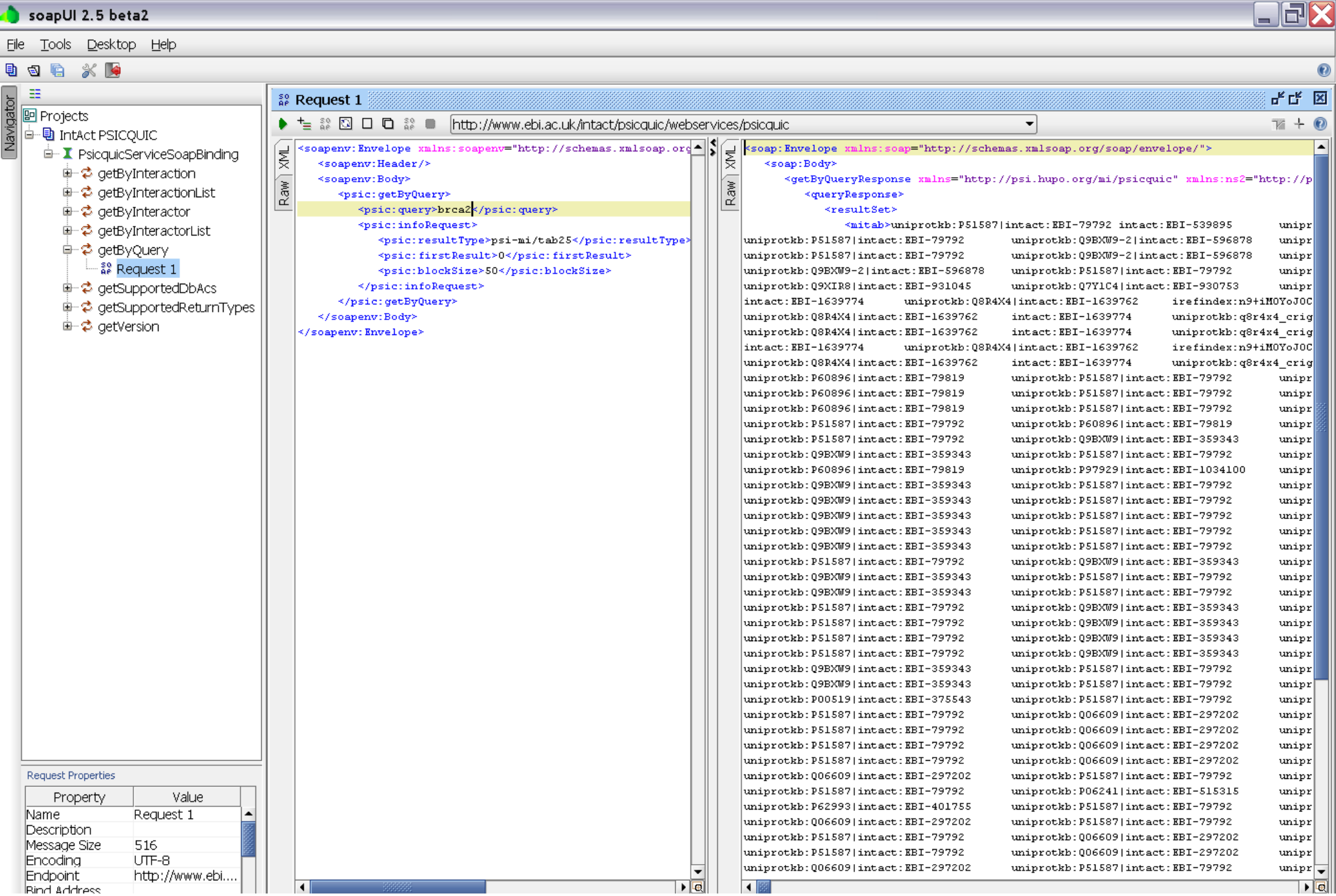
How can I access PSICQUIC?

As PSICQUIC is a Web Service, you can access the data:

- Via SOAP
  - A WSDL file exists, and it is the same for all the databases.
  - IntAct has developed a Java client, but any other languages can be used.
  - You can use it to get interactions in two standard formats: PSI-MI XML and PSI-MI TAB.
- Via REST
  - Retrieving data directly by using a URL
  - Easy to access and data can be obtained just using an internet browser.
  - Effective for scripting.



SoapUI: Executing a query

Use query brca2 and resultType psi-mi/tab25

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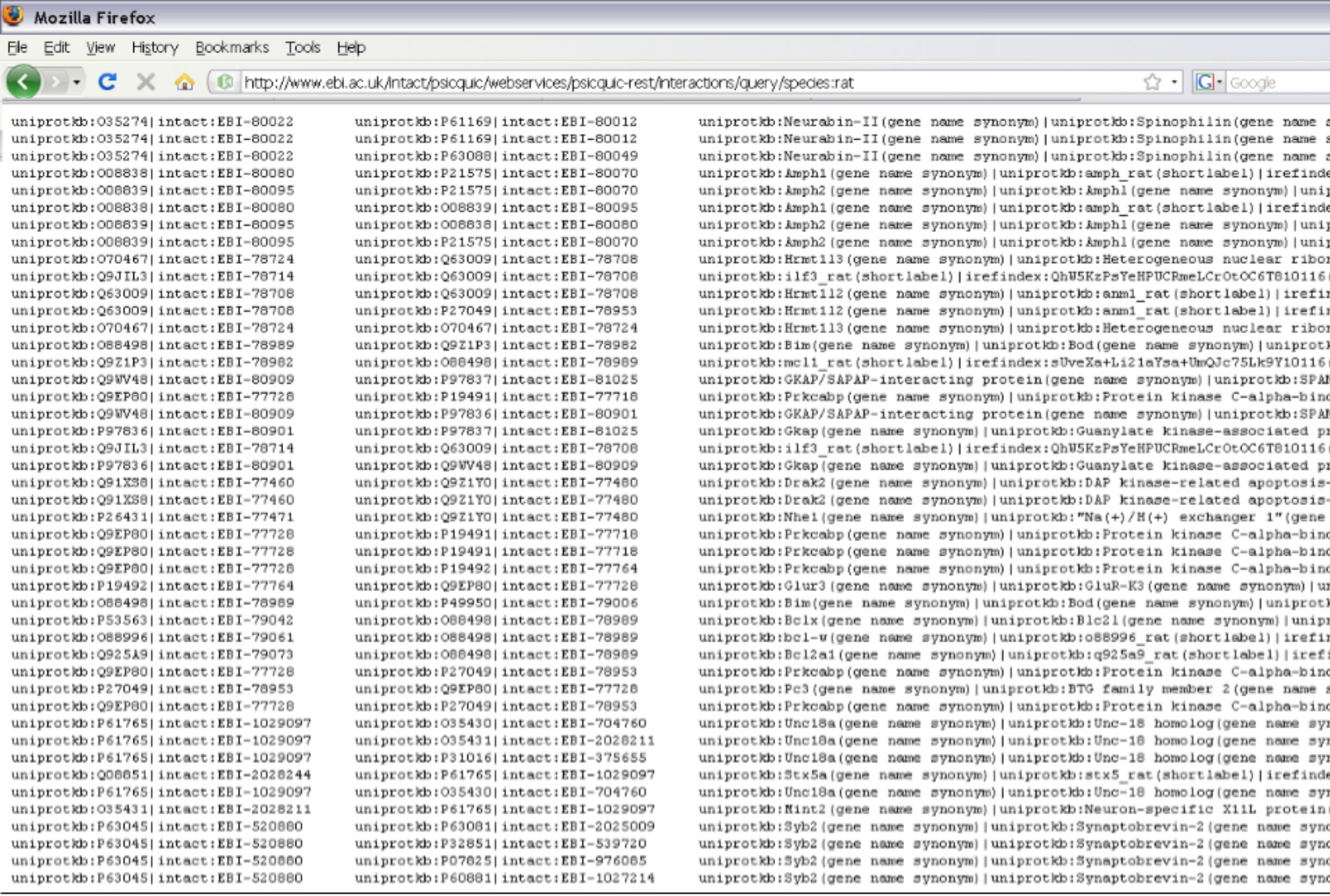

PSICQUIC: REST query

http://www.ebi.ac.uk/Tools/webservices/psicquic/intact/webservices/current/search/query/species:rat

Standards and more

FORMATS

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GMOD Meeting
13th – 16th September 2010
Cambridge, UK

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Default formats

- The default formats are:
  - PSI-MI XML 2.5.4 (psi-mi/xml25)
  - PSI MITAB 2.5 (psi-mi/tab25)
  - Compressed MITAB (tab25-bin) – Only REST
  - Count (count) – Only REST

- New formats will be included in the future (work in progress):
  - BioPAX (biopax)
  - And other RDF formats (rdf-xml / rdf-n3 / rdf-n3-triple / rdf-turtle)

  - (so it will be possible to use PSICQUIC in the semantic web!)

psi-mi/tab25


```
uniprotkb:P51587|intact:EBI-79792	intact:EBI-539895	uniprotkb:FANCD1(gene name synonym)|uniprotkb:FACD(gene name synonym)|uniprotkb:Fanco
uniprotkb:P51587|intact:EBI-79792	uniprotkb:Q9BXW9-2|intact:EBI-596878	uniprotkb:FANCD1(gene name synonym ynonym)
uniprotkb:P51587|intact:EBI-79792	uniprotkb:Q9BXW9-2|intact:EBI-596878	uniprotkb:FANCD1(gene name synonym ynonym)
uniprotkb:Q9BXW9-2|intact:EBI-596878	uniprotkb:P51587|intact:EBI-79792	uniprotkb:Q9BXW9-2(shortlabel)|irefindex:6AWD3dGTnA21voORuKrBfhoxny09
uniprotkb:Q9XIR8|intact:EBI-931045	uniprotkb:Q7Y1C4|intact:EBI-930753	uniprotkb:At1g64750(locus name)|uniprotkb:F13O11.6(orf name)|uniprotk
intact:EBI-1639774	uniprotkb:Q8R4X4|intact:EBI-1639762	irefindex:n9+iM0YoJOC9AgBNURd2G9PXjAo10029(rogid)	uniprotkb:q8r4x4_crigr(shortl
uniprotkb:Q8R4X4|intact:EBI-1639762	intact:EBI-1639774	uniprotkb:q8r4x4_crigr(shortlabel)|irefindex:yFw+icocB1uWApX3L62zhgIHJt010029(rogid)
uniprotkb:Q8R4X4|intact:EBI-1639762	intact:EBI-1639774	uniprotkb:q8r4x4_crigr(shortlabel)|irefindex:yFw+icocB1uWApX3L62zhgIHJt010029(rogid)
intact:EBI-1639774	uniprotkb:Q8R4X4|intact:EBI-1639762	irefindex:n9+iM0YoJOC9AgBNURd2G9PXjAo10029(rogid)	uniprotkb:q8r4x4_crigr(shortl
uniprotkb:Q8R4X4|intact:EBI-1639762	intact:EBI-1639774	uniprotkb:q8r4x4_crigr(shortlabel)|irefindex:yFw+icocB1uWApX3L62zhgIHJt010029(rogid)
uniprotkb:P60896|intact:EBI-79819	uniprotkb:P51587|intact:EBI-79792	uniprotkb:DSS1(gene name synonym)|uniprotkb:SHFDG1(gene name synonym)
uniprotkb:P60896|intact:EBI-79819	uniprotkb:P51587|intact:EBI-79792	uniprotkb:DSS1(gene name synonym)|uniprotkb:SHFDG1(gene name synonym)
uniprotkb:P60896|intact:EBI-79819	uniprotkb:P51587|intact:EBI-79792	uniprotkb:DSS1(gene name synonym)|uniprotkb:SHFDG1(gene name synonym)
uniprotkb:P51587|intact:EBI-79792	uniprotkb:P60896|intact:EBI-79819	uniprotkb:FANCD1(gene name synonym)|uniprotkb:FACD(gene name synonym)
uniprotkb:P51587|intact:EBI-79792	uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:FANCD1(gene name synonym)|uniprotkb:FACD(gene name synonym)
uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:P51587|intact:EBI-79792	uniprotkb:FACD(gene name synonym)|uniprotkb:facd2_human(shortlabel)|i
uniprotkb:P60896|intact:EBI-79819	uniprotkb:P97929|intact:EBI-1034100	uniprotkb:DSS1(gene name synonym)|uniprotkb:SHFDG1(gene name synonym)
uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:P51587|intact:EBI-79792	uniprotkb:FACD(gene name synonym)|uniprotkb:facd2_human(shortlabel)|i
uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:P51587|intact:EBI-79792	uniprotkb:FACD(gene name synonym)|uniprotkb:facd2_human(shortlabel)|i
uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:P51587|intact:EBI-79792	uniprotkb:FACD(gene name synonym)|uniprotkb:facd2_human(shortlabel)|i
uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:P51587|intact:EBI-79792	uniprotkb:FACD(gene name synonym)|uniprotkb:facd2_human(shortlabel)|i
uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:P51587|intact:EBI-79792	uniprotkb:FACD(gene name synonym)|uniprotkb:facd2_human(shortlabel)|i
uniprotkb:P51587|intact:EBI-79792	uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:FANCD1(gene name synonym)|uniprotkb:FACD(gene name synonym)
uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:P51587|intact:EBI-79792	uniprotkb:FACD(gene name synonym)|uniprotkb:facd2_human(shortlabel)|i
uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:P51587|intact:EBI-79792	uniprotkb:FACD(gene name synonym)|uniprotkb:facd2_human(shortlabel)|i
uniprotkb:P51587|intact:EBI-79792	uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:FANCD1(gene name synonym)|uniprotkb:FACD(gene name synonym)
uniprotkb:P51587|intact:EBI-79792	uniprotkb:Q9BXW9|intact:EBI-359343	uniprotkb:FANCD1(gene name synonym)|uniprotkb:FACD(gene name synonym)
```


psi-mi/xml25


```
- <entrySet minorVersion="4" version="5" level="2">
  - <entry>
    - <source releaseDate="2009-04-17+01:00">
      - <names>
          <shortLabel>European Bioinformatics Institute</shortLabel>
        </names>
      - <attributeList>
        - <attribute name="postalAddress">
            Wellcome Trust Genome Campus, Hinxton, Cambridge, CB10 1SD, United Kingdom
          </attribute>
          <attribute name="url">http://www.ebi.ac.uk</attribute>
        </attributeList>
      </source>
    - <interactionList>
      - <interaction id="201">
        - <names>
            <shortLabel>P51587-EBI-539895-P51587-Q06609-1</shortLabel>
          </names>
        - <xref>
            <primaryRef refTypeAc="MI:0356" refType="identity" id="EBI-297231" dbAc="MI:0469" db="intact"/>
          </xref>
        - <experimentList>
          - <experimentDescription id="202">
```

biopax

```
<rdf:RDF
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:bp="http://www.biopax.org/release/biopax-level3.owl#"
    xmlns:owlmi="http://purl.org/obo/owl/MI#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:psimi="http://www.ebi.ac.uk/~intact/psimi.owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns="http://www.ebi.ac.uk/intact/"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xml:base="http://www.ebi.ac.uk/intact/">
  <owl:Ontology rdf:about="">
    <owl:imports rdf:resource="http://www.biopax.org/release/biopax-level3.owl"/>
  </owl:Ontology>
  <bp:MolecularInteraction rdf:about="http://purl.uniprot.org/intact/EBI-1639937">
    <bp:participant>
      <bp:Protein rdf:about="http://purl.uniprot.org/uniprot/Q9BXW9">
        <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Q9BXW9</rdfs:label>
      </bp:Protein>
    </bp:participant>
    <bp:participant>
      <bp:Protein rdf:about="http://purl.uniprot.org/uniprot/P51587">
        <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >P51587</rdfs:label>
      </bp:Protein>
    </bp:participant>
    <bp:interactorType>
      <bp:InteractionVocabulary rdf:about="http://purl.org/obo/owl/MI#MI_0915">
        <bp:name>physical association</bp:name>
        <rdfs:label>physical association</rdfs:label>
      </bp:InteractionVocabulary>
    </bp:interactorType>
    <bp:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
    >P51587-Q9BXW9-1</bp:name>
    <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
    >P51587-Q9BXW9-1</rdfs:label>
  </bp:MolecularInteraction>
  <bp:MolecularInteraction rdf:about="http://purl.uniprot.org/intact/EBI-260802">
    <bp:participant>
      <bp:Protein rdf:about="http://purl.uniprot.org/uniprot/Q9W157">
        <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Q9W157</rdfs:label>
      </bp:Protein>
    </bp:participant>
```

RDF/XML

```
<rdf:RDF
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:bp="http://www.biopax.org/release/biopax-level3.owl#"
    xmlns:owlmi="http://purl.org/obo/owl/MI#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:psimi="http://www.ebi.ac.uk/~intact/psimi.owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns="http://www.ebi.ac.uk/intact/"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xml:base="http://www.ebi.ac.uk/intact/" >
  <rdf:Description rdf:about="http://purl.uniprot.org/intact/EBI-1639937">
    <bp:participant rdf:resource="http://purl.uniprot.org/uniprot/Q9BXW9"/>
    <bp:participant rdf:resource="http://purl.uniprot.org/uniprot/P51587"/>
    <bp:interactorType rdf:resource="http://purl.org/obo/owl/MI#MI_0915"/>
    <bp:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">P51587-Q9BXW9-1</bp:name>
    <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string">P51587-Q9BXW9-1</rdfs:label>
    <rdf:type rdf:resource="http://www.biopax.org/release/biopax-level3.owl#MolecularInteraction"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://purl.uniprot.org/intact/EBI-260802">
    <bp:participant rdf:resource="http://purl.uniprot.org/uniprot/Q9W157"/>
    <bp:participant rdf:resource="http://purl.uniprot.org/uniprot/O77135"/>
    <bp:interactorType rdf:resource="http://purl.org/obo/owl/MI#MI_0915"/>
    <bp:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">O77135-Q9W157-1</bp:name>
    <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string">O77135-Q9W157-1</rdfs:label>
    <rdf:type rdf:resource="http://www.biopax.org/release/biopax-level3.owl#MolecularInteraction"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://purl.uniprot.org/intact/EBI-2461712">
    <bp:participant rdf:resource="http://purl.uniprot.org/uniprot/P51587"/>
    <bp:participant rdf:resource="http://purl.uniprot.org/uniprot/O94776"/>
    <bp:interactorType rdf:resource="http://purl.org/obo/owl/MI#MI_0914"/>
    <bp:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">O94776-P51587-1</bp:name>
    <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string">O94776-P51587-1</rdfs:label>
    <rdf:type rdf:resource="http://www.biopax.org/release/biopax-level3.owl#MolecularInteraction"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://purl.uniprot.org/uniprot/O77135">
    <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string">O77135</rdfs:label>
    <rdf:type rdf:resource="http://www.biopax.org/release/biopax-level3.owl#Protein"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://purl.uniprot.org/intact/EBI-930908">
    <bp:participant rdf:resource="http://purl.uniprot.org/uniprot/O81303"/>
    <bp:participant rdf:resource="http://purl.uniprot.org/uniprot/P94102"/>
    <bp:interactorType rdf:resource="http://purl.org/obo/owl/MI#MI_0915"/>
    <bp:name rdf:datatype="http://www.w3.org/2001/XMLSchema#string">P94102-O81303-1</bp:name>
    <rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string">P94102-O81303-1</rdfs:label>
    <rdf:type rdf:resource="http://www.biopax.org/release/biopax-level3.owl#MolecularInteraction"/>
  </rdf:Description>
```

RDF N3

```
@prefix :        <http://www.ebi.ac.uk/intact/> .
@prefix rdfs:    <http://www.w3.org/2000/01/rdf-schema#> .
@prefix bp:      <http://www.biopax.org/release/biopax-level3.owl#> .
@prefix xsd:     <http://www.w3.org/2001/XMLSchema#> .
@prefix owl:     <http://www.w3.org/2002/07/owl#> .
@prefix rdf:     <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix owlmi:   <http://purl.org/obo/owl/MI#> .
@prefix psimi:   <http://www.ebi.ac.uk/~intact/psimi.owl#> .

<http://purl.uniprot.org/intact/EBI-1639937>
      a       bp:MolecularInteraction ;
      rdfs:label "P51587-Q9BXW9-1"^^xsd:string ;
      bp:interactorType owlmi:MI_0915 ;
      bp:name "P51587-Q9BXW9-1"^^xsd:string ;
      bp:participant <http://purl.uniprot.org/uniprot/Q9BXW9> , <http://purl.uniprot.org/uniprot/P51587> .

<http://purl.uniprot.org/intact/EBI-260802>
      a       bp:MolecularInteraction ;
      rdfs:label "O77135-Q9W157-1"^^xsd:string ;
      bp:interactorType owlmi:MI_0915 ;
      bp:name "O77135-Q9W157-1"^^xsd:string ;
      bp:participant <http://purl.uniprot.org/uniprot/O77135> , <http://purl.uniprot.org/uniprot/Q9W157> .

<http://purl.uniprot.org/intact/EBI-2461712>
      a       bp:MolecularInteraction ;
      rdfs:label "O94776-P51587-1"^^xsd:string ;
      bp:interactorType owlmi:MI_0914 ;
      bp:name "O94776-P51587-1"^^xsd:string ;
      bp:participant <http://purl.uniprot.org/uniprot/O94776> , <http://purl.uniprot.org/uniprot/P51587> .

<http://purl.uniprot.org/uniprot/O77135>
      a       bp:Protein ;
      rdfs:label "O77135"^^xsd:string .

<http://purl.uniprot.org/intact/EBI-930908>
      a       bp:MolecularInteraction ;
      rdfs:label "P94102-O81303-1"^^xsd:string ;
      bp:interactorType owlmi:MI_0915 ;
      bp:name "P94102-O81303-1"^^xsd:string ;
      bp:participant <http://purl.uniprot.org/uniprot/O81303> , <http://purl.uniprot.org/uniprot/P94102> .

<http://purl.uniprot.org/intact/EBI-931053>
      a       bp:MolecularInteraction ;
      rdfs:label "O81303-Q9XIR8-1"^^xsd:string ;
      bp:interactorType owlmi:MI_0407 ;
      bp:name "O81303-Q9XIR8-1"^^xsd:string ;
      bp:participant <http://purl.uniprot.org/uniprot/Q9XIR8> , <http://purl.uniprot.org/uniprot/O81303> .
```

Where are the services?

THE REGISTRY

The PSICQUIC Registry

- It contains a **list of the PSICQUIC services** from different providers.
- It is a **web service** itself, and it can be accessed remotely using REST.
- Information can be found about the services, such as the URLs to use, number of interactions provided, versioning, etc.
- The Registry can be found at: http://www.ebi.ac.uk/Tools/webservices/psicquic/registry/registry?action=STATUS

PSICQUIC Registry

Name	Active	Interactions	Version	SOAP URL	REST URL	REST Example	Restricted	Tags	Comme
APID	YES	416,124	1.1.5	http://cicblade.dep.usal.es	http://cicblade.dep.usal.es	Example	NO	protein-protein imported spoke clustered	
ChEMBL	YES	581,858	1.1.0	http://www.ebi.ac.uk/Tools	http://www.ebi.ac.uk/Tools	Example	NO	smallmolecule-protein internally curated mimix curation spoke evidence	
InnateDB	YES	9,909	1.1.5	http://imex.innatedb.com/	http://imex.innatedb.com/	Example	NO	protein-protein internally curated spoke rapid curation evidence	
DIP	YES	20,769	1.1.6-SNAPSHOT	http://imex.mbi.ucla.edu/p	http://imex.mbi.ucla.edu/p	Example	NO	protein-protein internally curated imex curation mimix curation spoke evidence	
BioGrid	NO	337,957	1.1.6-SNAPSHOT	http://tyerslab.bio.ed.ac.ul	http://tyerslab.bio.ed.ac.ul	Example	NO	protein-protein internally curated rapid curation spoke evidence	
MINT	YES	124,473	1.1.5	http://mint.bio.uniroma2.it/	http://mint.bio.uniroma2.it/	Example	NO	protein-protein internally curated imex curation mimix curation spoke evidence	
IntAct	YES	228,262	1.1.6-SNAPSHOT	http://www.ebi.ac.uk/Tools	http://www.ebi.ac.uk/Tools	Example	NO	protein-protein smallmolecule-protein nucleicacid-protein	
iRefIndex	YES	404,453	1.1.5	http://biotin.uio.no:8080/ps	http://biotin.uio.no:8080/ps	Example	NO	protein-protein	

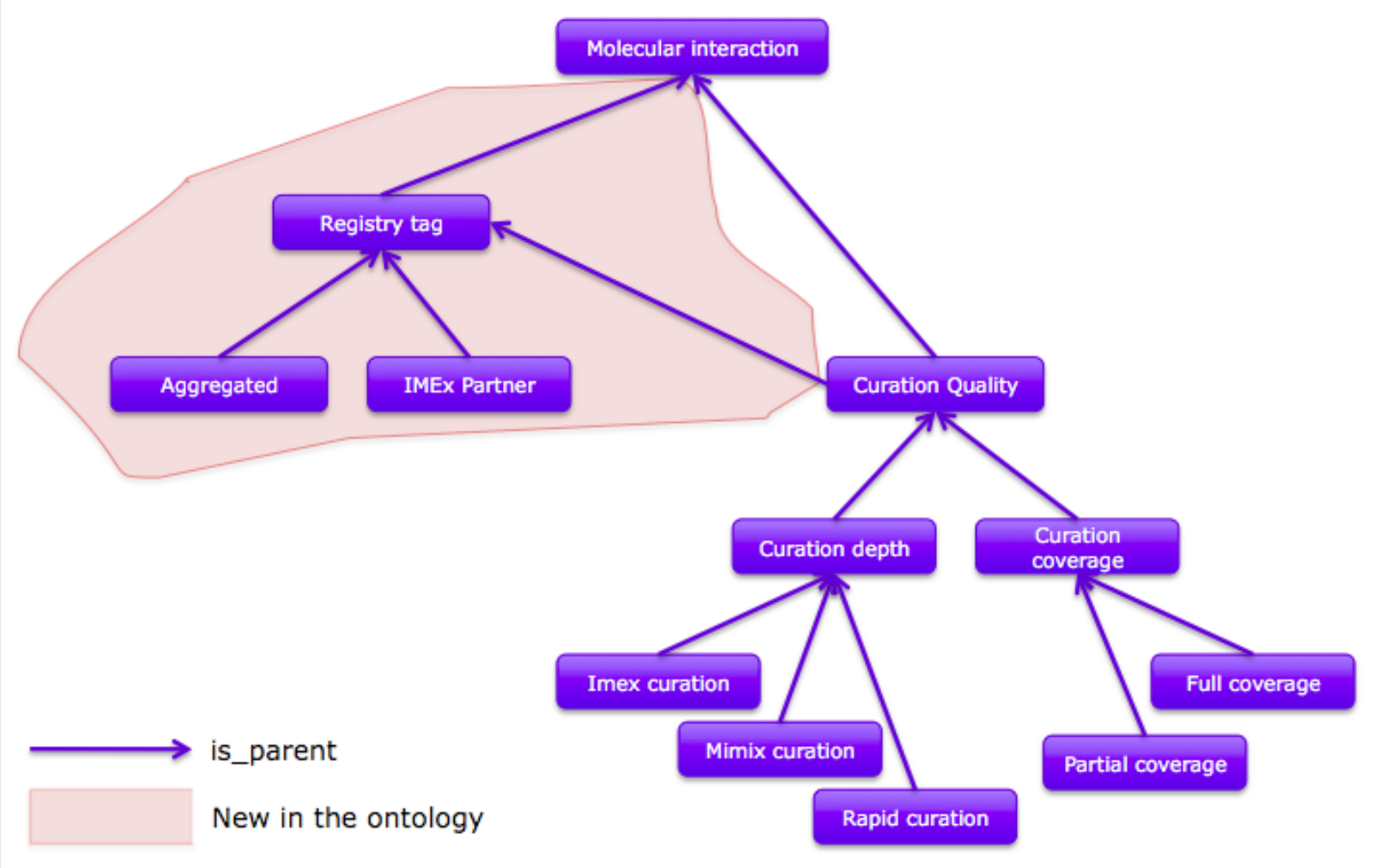
More than **14,000,000** binary interactions available
from **13** different sources

PSICQUIC: Registry

http://www.ebi.ac.uk/Tools/webservices/psicquic/registry/registry?action=STATUS

Registry Tagging system

- The registry classifies the different services with tags.



Querying the registry

- The registry can be accessed with the browser or programmatically (it is a **web service**).
- Instructions on how to use it can be found here:
  - http://code.google.com/p/psicquic/wiki/Registry
- Querying by tags is work in progress at the moment (it will be explained tomorrow).

Examples

REAL APPLICATIONS

PSICQUIC Applications

- It is clear the value of PSICQUIC to application developers, so indirectly the end-user is benefited too.
- Reduces the time to implement an application that uses data from the different provides, as all of them are accessed the same way.
- Some of the applications:
  - Cytoscape 2.7.x
  - PSICQUIC View
  - Envision2
  - PSICQUIC Client for Android
  - **GMOD client?**

PSICQUIC View

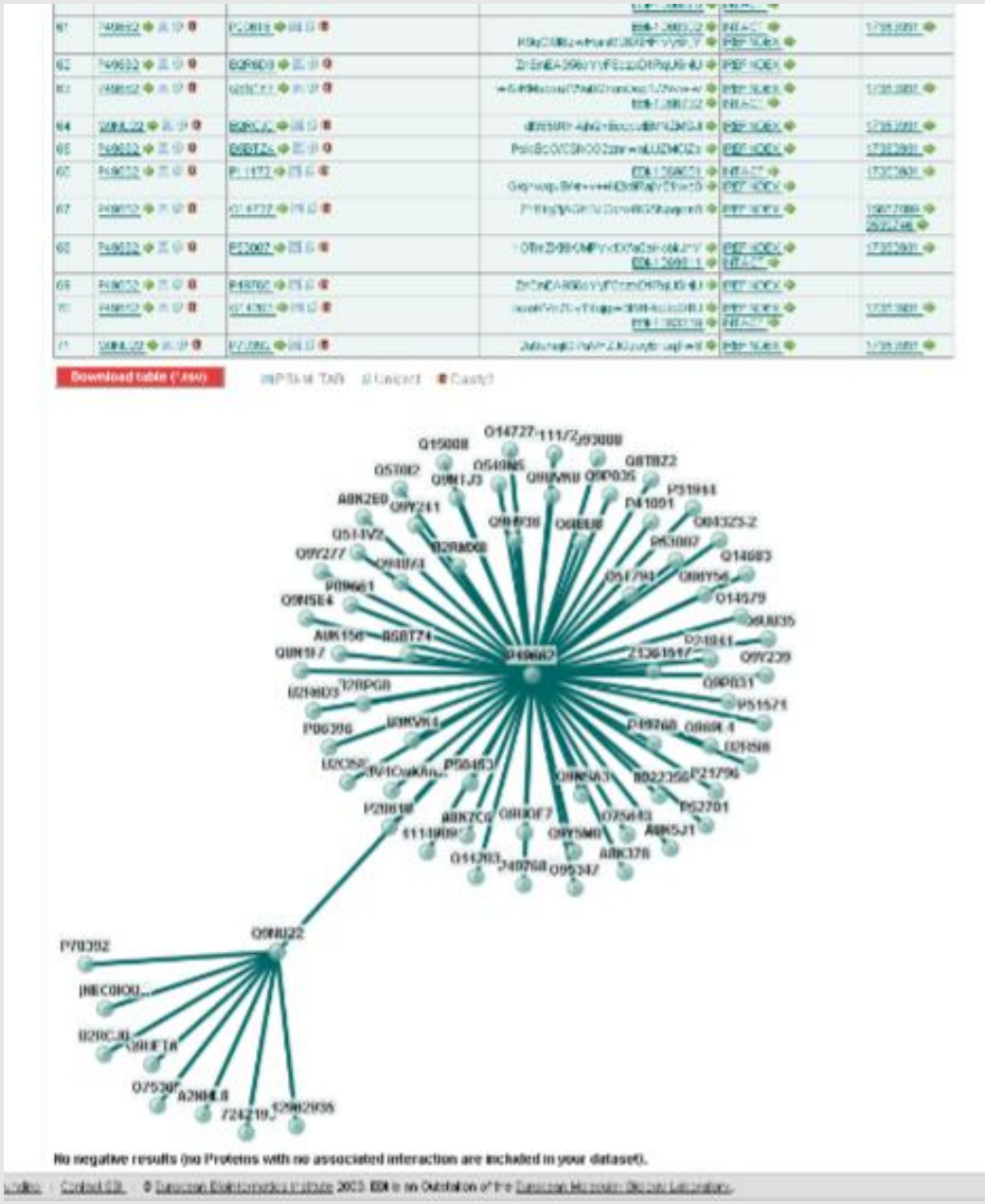
Search: brca2 Search Clear Fields »

ChEMBL (0) | DIP (0) | **IntAct (89)** | MINT (22) | MPIDB (0) | MatrixDB (0) | Reactome (0) | Reactome-Functional-Interactions (29) | iRefIndex (31)

Export: MITAB 2.5 PSI-XML 2.5.4

	Name molecule A	Links molecule A	Name molecule B	Links molecule B	Alt. identifiers molecule A	Alt. identifiers molecule B	Aliases molecule A	Aliases molecule B	Species molecule A	Specie
1	P51587; EBI-79792	UniProt	EBI-539895		FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human		BRCA2		Human (9606)	-1
2	P51587; EBI-79792	UniProt	Q9BXW9-2; EBI-596878	UniProt	FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human	Q9BXW9-2	BRCA2		Human (9606)	Human (
3	P51587; EBI-79792	UniProt	Q9BXW9-2; EBI-596878	UniProt	FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human	Q9BXW9-2	BRCA2		Human (9606)	Human (
4	P51587; EBI-79792	UniProt	Q9BXW9-2; EBI-596878	UniProt	FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human	Q9BXW9-2	BRCA2		Human (9606)	Human (
5	CHEBI:15422; EBI-1108845	ChEBI	P51587; EBI-79792	UniProt	atp	FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human		BRCA2		Human (
6	CHEBI:15422; EBI-1108845	ChEBI	P51587; EBI-79792	UniProt	atp	FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human		BRCA2		Human (
7	CHEBI:15422; EBI-1108845	ChEBI	P51587; EBI-79792	UniProt	atp	FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human		BRCA2		Human (
8	CHEBI:15422; EBI-1108845	ChEBI	P51587; EBI-79792	UniProt	atp	FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human		BRCA2		Human (
9	CHEBI:15422; EBI-1108845	ChEBI	P51587; EBI-79792	UniProt	atp	FANCD1; FACD; Fanconi anemia group D1 protein; brca2_human		BRCA2		Human (
10	Q9FL96; EBI-931034	UniProt	Q7Y1C4; EBI-930753	UniProt	At5g45010; K21C13.20; sem12_arath	At5g01630; q7y1c4_arath		brca2b	Mouse-ear cress (3702)	Mouse-e
11	Q9XIR8; EBI-931045	UniProt	Q7Y1C4; EBI-930753	UniProt	At1g64750; F13O11.6; sem11_arath	At5g01630; q7y1c4_arath		brca2b	Mouse-ear cress (3702)	Mouse-e
12	Q9XIR8; EBI-931045	UniProt	Q7Y1C4; EBI-930753	UniProt	At1g64750; F13O11.6; sem11_arath	At5g01630; q7y1c4_arath		brca2b	Mouse-ear cress (3702)	Mouse-e
13	Q9FL96; EBI-931034	UniProt	Q7Y1C4; EBI-930753	UniProt	At5g45010; K21C13.20; sem12_arath	At5g01630; q7y1c4_arath		brca2b	Mouse-ear cress (3702)	Mouse-e
								BRCA2	Human (9606)	Human (
					Split hand/foot deleted protein 1; dss1_human					

http://www.ebi.ac.uk/Tools/webservices/psicquic/view/



Envision2

As an example of PSICQUIC integration

Powerful queries with the Molecular Interaction Query Language

MIQL

Bruno Aranda (baranda@ebi.ac.uk)

GMOD Meeting
13th – 16th September 2010
Cambridge, UK

EMBL-EBI

Common Query Language

- The Molecular Interactions Query Language (MIQL) allows more powerful and flexible queries.
- It is the default query syntax for PSIQCUIC.
- Designed for fast and effective searches on PSI-MI TAB files.
- All fields (columns) can be searched with specific queries.
- MIQL is a consensus between the different databases, so you should be able to use the same query across different repositories.

MIQL syntax reference

- The MIQL syntax is based on the Lucene syntax[1]. A query is broken into terms and operators:
  - Terms: single words or phrases (group of words surrounded by quotes). E.g. brca2 AND “pull down”
  - Fields: search in specific columns. E.g. brca2 AND species:human
  - Term modifiers: wildcard searches, fuzzy searches, proximity and range searches. E.g. brc*
  - Operands: OR (or space), AND, NOT, +, -. E.g. brca2 AND rpa1 / brca2 NOT mouse / +brca2 –mouse –expansion:spoke
  - Grouping and field grouping: brca2 AND (mouse "in vitro")

[1] http://lucene.apache.org/java/docs/queryparsersyntax.html

DIY

HOW TO CREATE YOUR SERVICE

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GMOD Meeting
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Simplest recipe to implement PSICQUIC

- Ingredients:
  - PSI-MITAB compliant file.
  - Subversion: to get the source code.
  - Maven: to run the scripts and start the service.
- Steps:
  - Generate the MITAB compliant file.
  - Get the Reference Implementation (RI):
    - http://code.google.com/p/psicquic/
  - Run the script to index the file.
  - Start the service with the script provided .

Lots of possibilities

CURRENT AND FUTURE WORK

Future developments

- Smart PSICQUICs: Identification and removal of redundancy
  - Merger and Cluster PSICQUIC services
- PSICQUIC 2.0
  - Overcome the current limitations and many fancy features:
    - Queries using CV terms not possible in the reference implementation (it is possible in IntAct).
    - PSI-MI XML is created from the MITAB, so no n-nary interactions.
  - New features:
    - Redundancy detection mechanism. ROG/RIG ids by default.
    - Built from PSI-MI XML, so complex data available.
- A GMOD component?

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PSICQUIC


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