



FAIR, PID-aware infrastructure in support of open science dissemination

Aravind Venkatesan 
EMBL-EBI

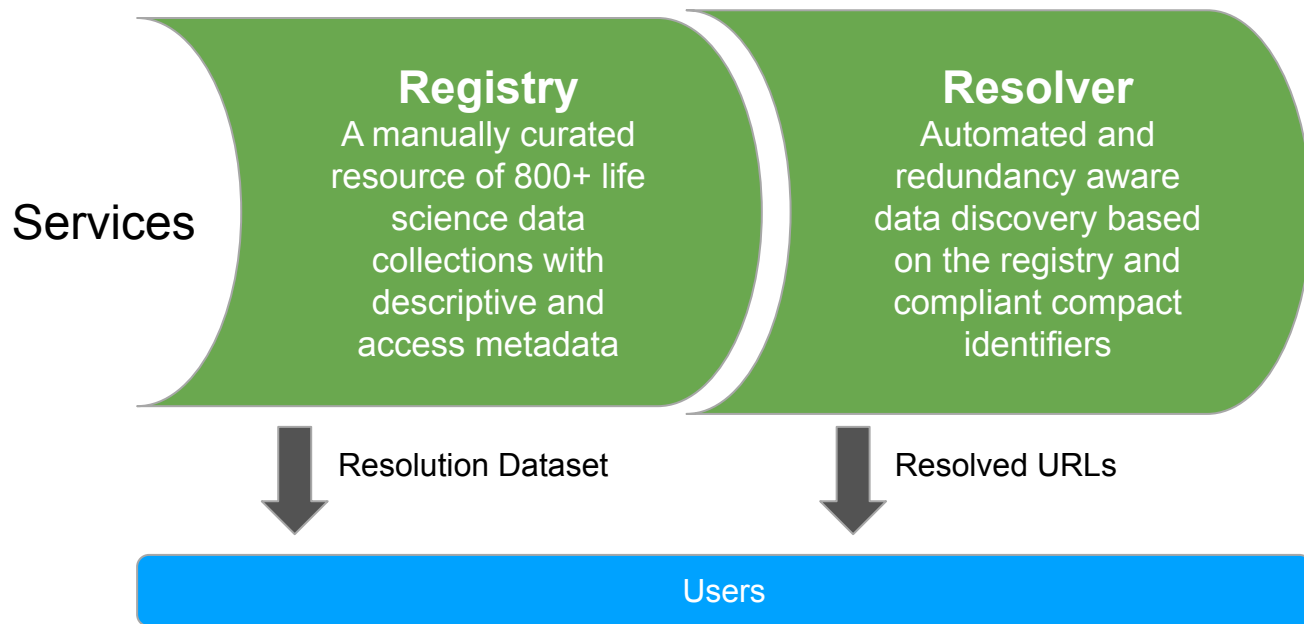
Renato Juacaba Neto 
EMBL-EBI



Co-funded by
the European Union



- Mission: provide Persistent Identifiers and services to enable consistent access to scientific data



Compact identifiers

- Compact Identifiers (CIDs) are Persistent Globally Unique IDs
- A unique **prefix** indicating the data collection (namespace)
- A locally unique identifier (**local_id**), sometimes called accession

prefix:local_id

ark:/13030/c7xk84q2j  **http://n2t.net/ark:/13030/c7xk84q2j**
resolves to



identifiers.org in the FAIR context

PiD
fest
CONFERENCE
ON PERSISTENT
IDENTIFIERS
2024

- Identifiers.org is an ELIXIR Recommended Interoperability Resource
- Working to establish Identifiers.org as a recommended resource within EOSC
 - Keeping the Registry accurate and healthy
 - Improve alignment with FAIR practices
 - Improvement of tombstone records
 - Study improvements to interoperability
 - Increase support to protected resources



EBI Search

- A fast and scalable text search engine
 - Provides easy and uniform access
 - Data hosted at EMBL-EBI and collaborators

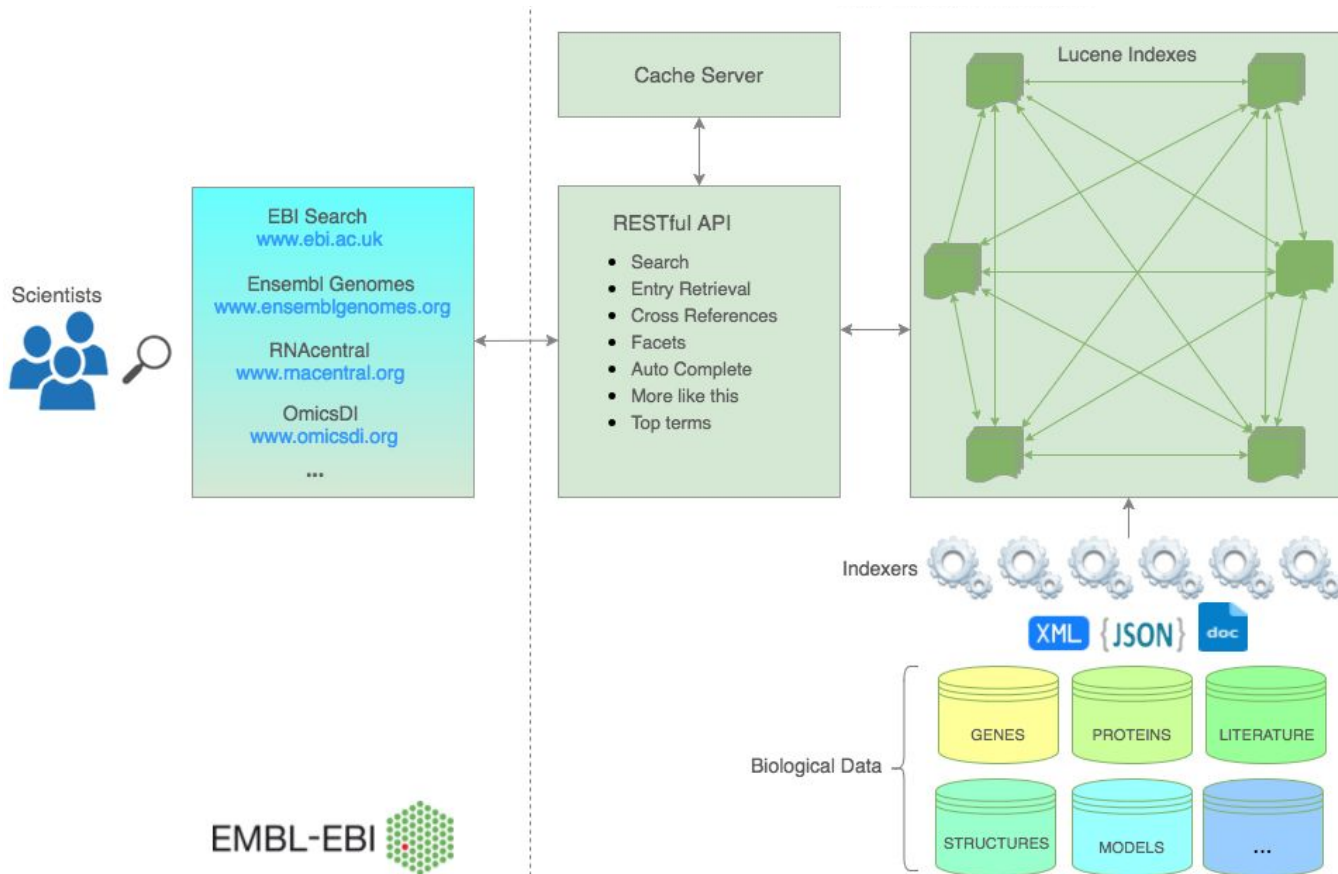
Almost 6 billion
entries indexed

Over 15 major
projects using
the service

Over 500
thousand
requests daily

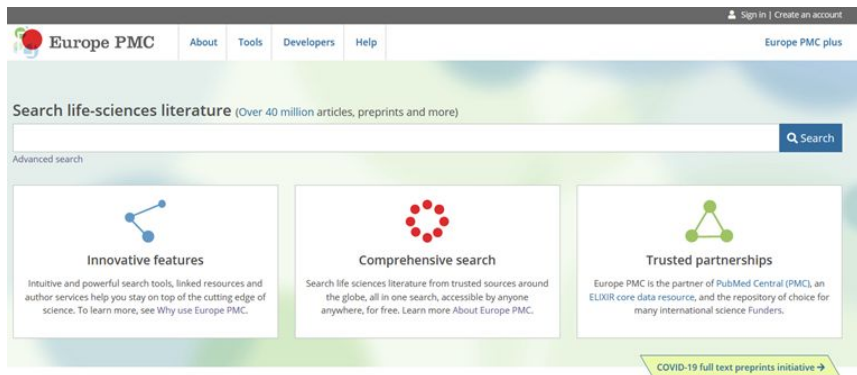


EBI Search as a service



Europe PMC

A free digital archive of
biomedical and life sciences research publications



Abstracts and metadata
from PubMed, Agricola



44.1 million

Full text publications
from PubMed Central



9.8 million

Preprint abstracts
and metadata
from various platforms



700 thousand

Preprint full text
COVID-19 and funder
preprints subset



34 thousand

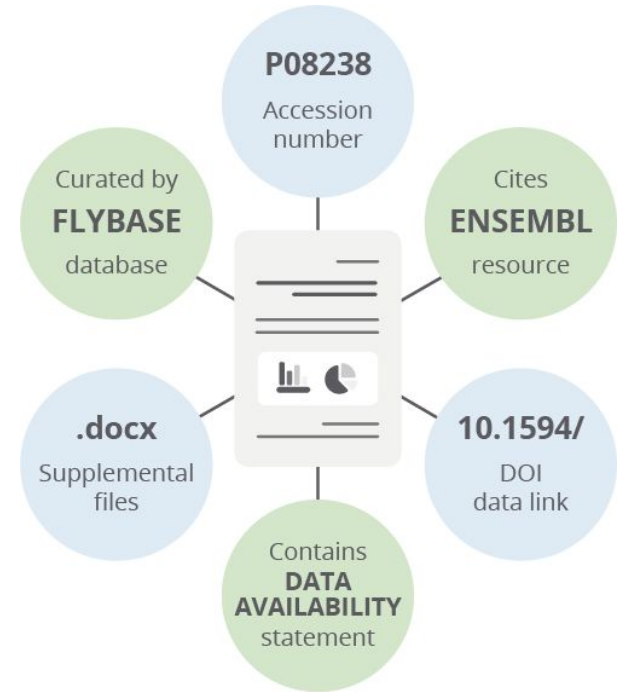
Data and services in Europe PMC



Literature-data linking in Europe PMC

Different ways of linking literature - data

- Explicit data links
- Implicit data mentions



Literature-Data linking in Action

**Europe PMC**

[About](#) [Tools](#) [Developers](#) [Help](#)

Europe PMC plus

[Abstract](#)
[Figures \(6\)](#)
[Free full text ▶](#)

[Citations & impact](#)
[Data](#)
[Similar Articles](#)
[Funding](#)

Data that cites the article

This data has been provided by curated databases and other sources that have cited the article.

Genes & Proteins

[Spastin](#) 
(UniProt - A0A0B4LHJ5)

Protein Structures

[spastin hexamer in complex with substrate](#) 
(PDB - 6p07)
[View structure ▶](#)

FlyBase

http://flybase.org/cgi-bin/uniqu.html?db=fbrf&field=pubmed_id&context... 

QuickGO Annotations

<https://www.ebi.ac.uk/QuickGO/annotations?reference=31285604> 

[Annotations \(574\)](#)
[Get citation](#)
[Open PDF](#)
[Claim to ORCID](#)

PMCID: PMC6761829



Literature-Data linking in Action



Europe PMC

About

Tools

Developers

Help

Europe PMC plus

Abstract

Figures (6)

Free full text ▶

Citations & impact

Data

Similar Articles

Funding

Data

Data behind the article

This data has been text mined from the article, or deposited into data resources.

BioStudies: supplemental material and supporting data

<http://www.ebi.ac.uk/biostudies/studies/S-EPMC6761829?xr=true>

Genes & Proteins

[UniProt - Q9UBP0](#) (1 citation)

Protein Structures (2)

[PDBe - 3B9P](#) (3 citations)

[View structure ▶](#)

[PDBe - 6P07](#) (2 citations)

[View structure ▶](#)

Annotations (574)

Get citation

Open PDF

Claim to ORCID

PMCID: PMC6761829

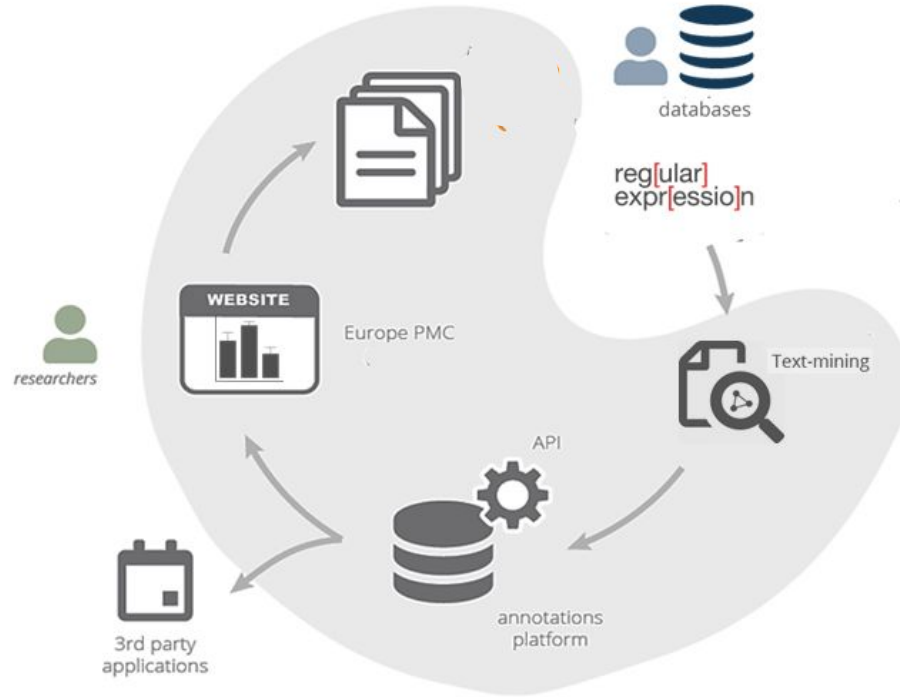


Europe
PMC

EMBL-EBI



Data citation workflow



Accession number validation



Grounding entities

User Stories

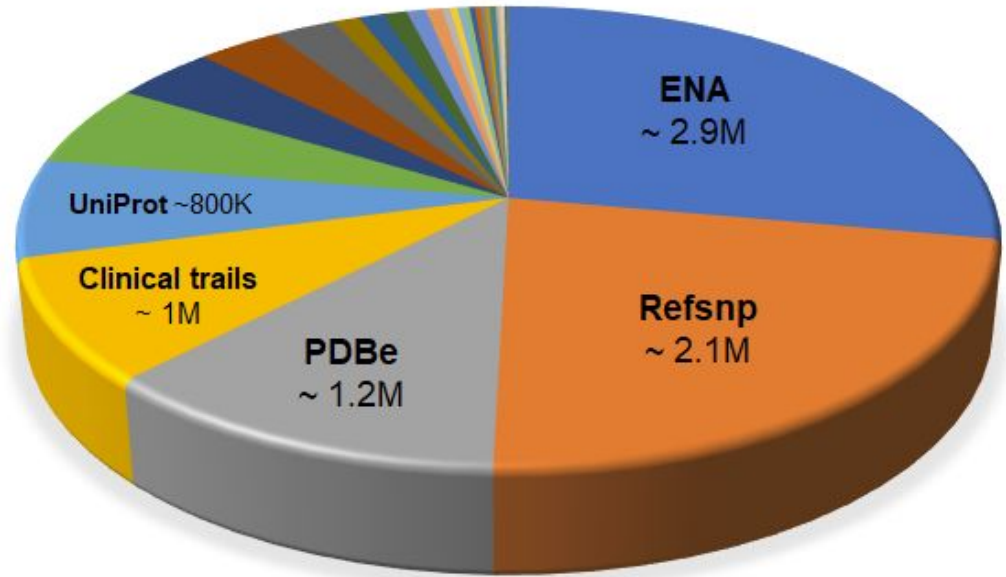
Metrics for monitoring resource usage

- Accession number mentions
- Data citation patterns
- Aids in understanding data resource usage



Database mentions in full text publications

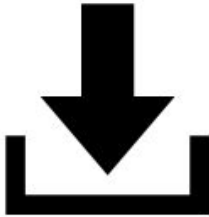
- Over 50 data resources
- ~9 million accession numbers mined



Data access



www.europepmc.org



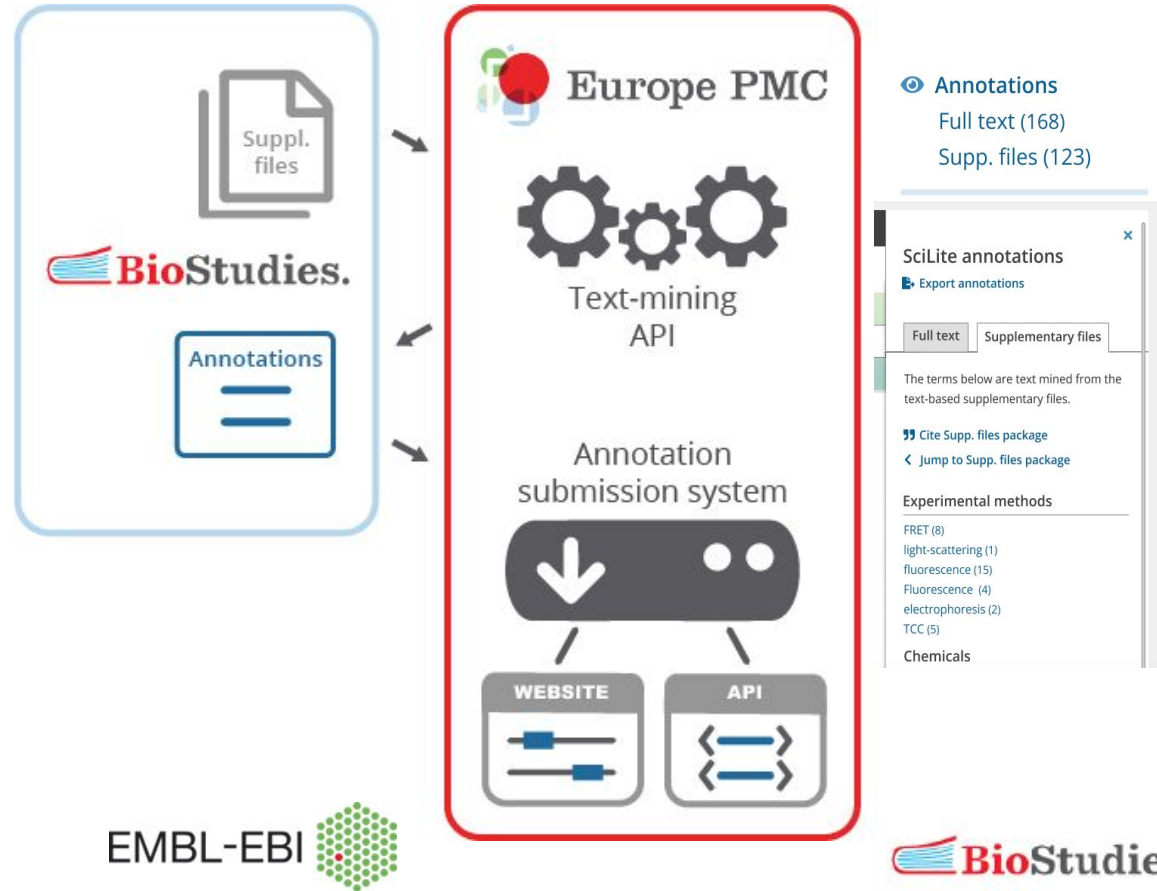
www.europepmc.org/downloads



www.europepmc.org/AnnotationsApi

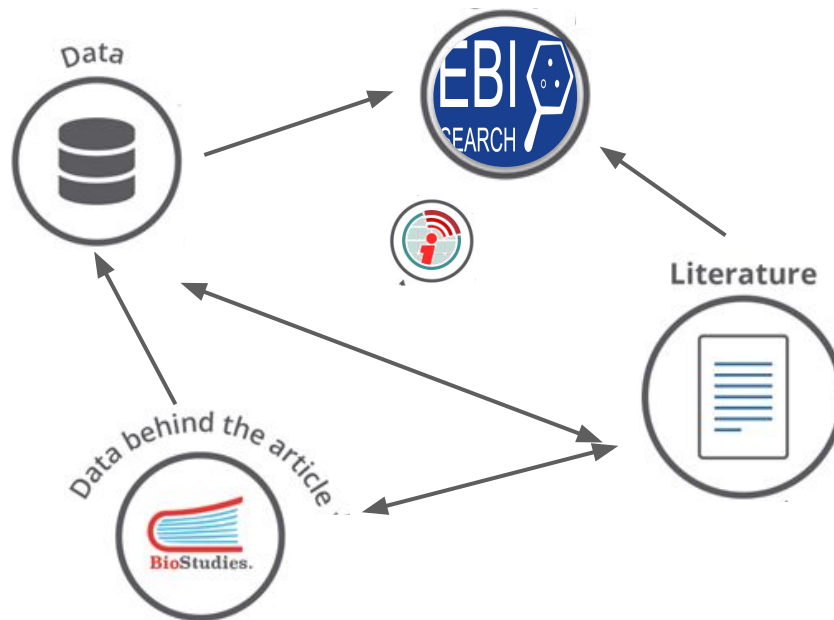
FAIRification of supplementary data

- Access to data in supplementary files
- Encouraging FAIR data citation
- Key component in PID graph

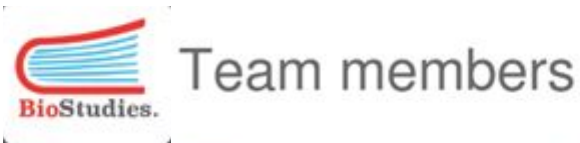
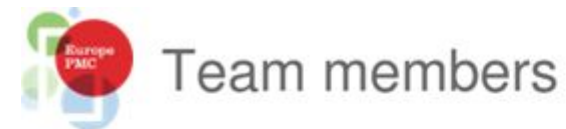


Summary

- Reliable Infrastructure
– access and publish content
- Encouraging FAIR data citation



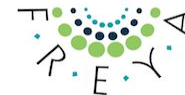
Acknowledgements



Team members



Acknowledgements



Contact and Help

Contact details

Europe PMC - helpdesk@europepmc.org

identifiers.org - identifiers-org@ebi.ac.uk

EBI search - eb-eye@ebi.ac.uk

