



Industry value of infectious disease open data



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ELIXIR – what do we do

ELIXIR is a Research Infrastructure (intergovernmental organisation) that coordinates life science resources such as:



Databases



Training



Software tools



Data standards



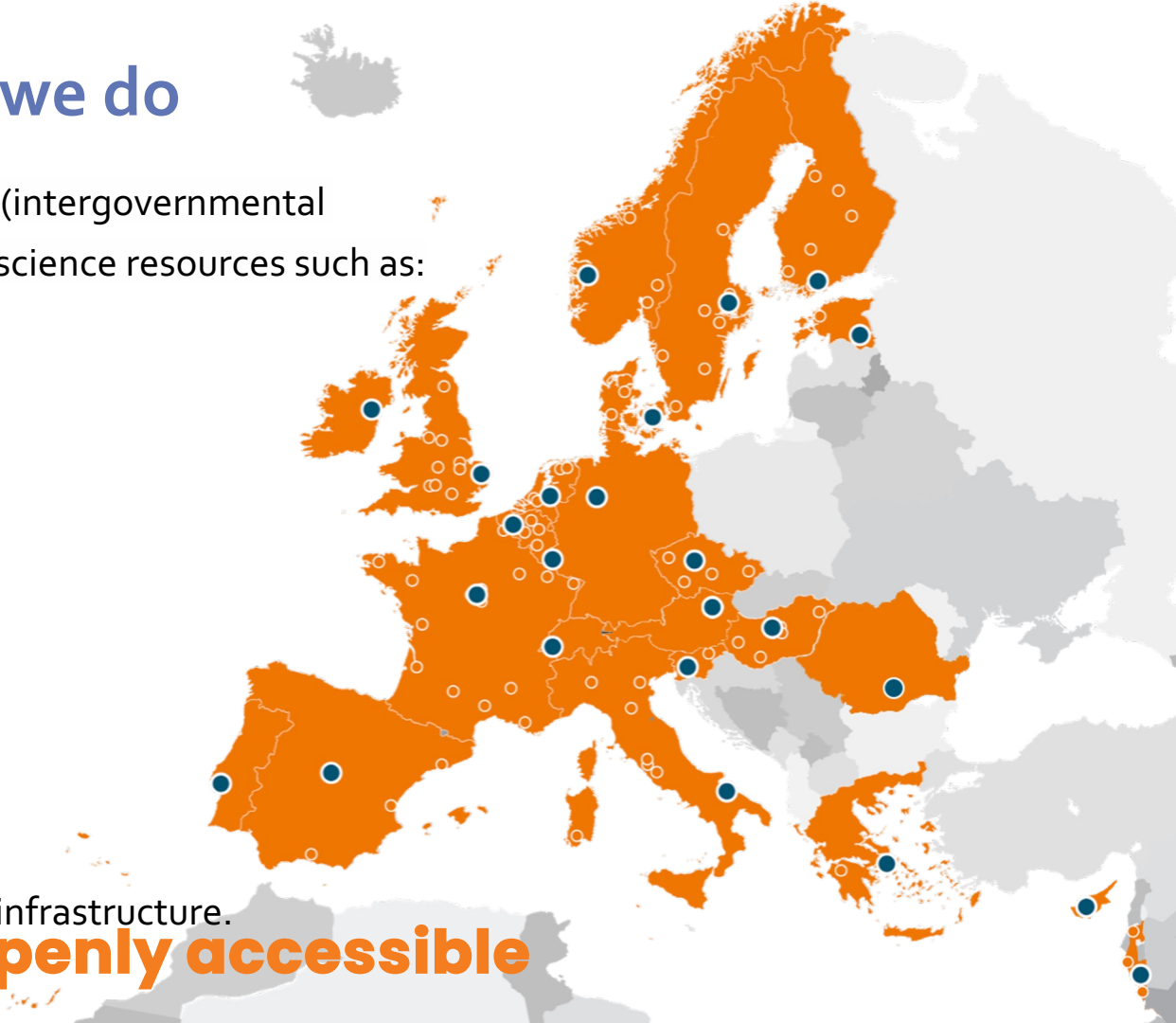
Compute resources



Scientific & technical experts

across Europe so they form a single infrastructure.

All resources are openly accessible



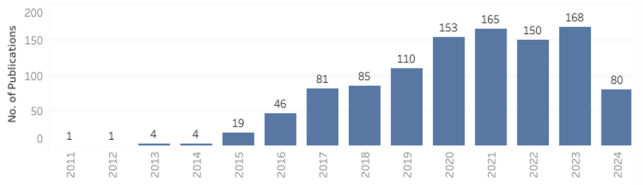
Impact work on the ELIXIR

[Home](#) [About us](#)

Impact

Browse examples of ELIXIR's impact, with more to be added over time. If you are part of ELIXIR, do join our [Impact group](#) (requires login) to access a network of like-minded peers.

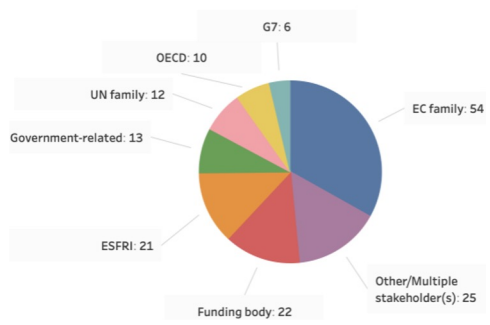
ELIXIR-supported publications



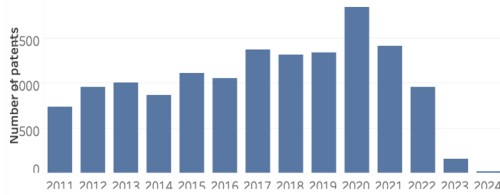
Citations of ELIXIR-supported publications



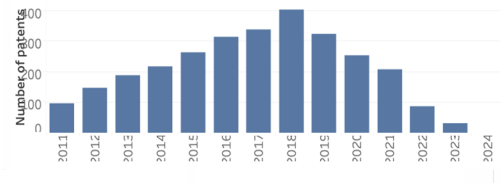
Targeted stakeholders



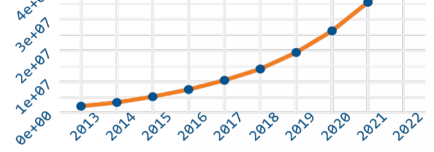
All Patent documents mentioning ELIXIR resource names - by Year of Priority Date



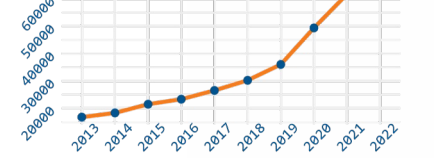
Granted and Active Patent documents mentioning ELIXIR resource names - by Year of Application Date



Data volume (GB) in CDR



Literature mentions of CDR



Collaboration with industry

What we are doing with industry and SMEs.

Beacons

ELIXIR supported the development of a globally adopted data-sharing technology.

Job vacancies

Our contribution to jobs and recruitment in the bioinformatics sector.

Node connections

How ELIXIR Nodes work together to create a pan-European research infrastructure.

Patents

Mentions of ELIXIR resource names in patent applications.

Publications

ELIXIR's scientific legacy as a research infrastructure.

Shaping policy

Our engagement with stakeholders of the policy sphere.

Impact Toolkit

The ELIXIR Impact Toolkit and supporting resources.

More examples

Search for many more examples of ELIXIR's impact, and filter them by impact category.

Supported by

PathOS

Open Science Impact Pathways

The question for us is **not if**, but **how** are used by industry

Innovation from open research resources - ELIXIR

Bioinformatics



Open science practices during the Covid-19 pandemic

COVID-19



Fostering innovation in climate change - Horizon 2020

Climate



Open science on remedying structural inequalities

Gender



Effects of open research data from a national repository

EASY – The Netherlands



Research data and knowledge use / uptake in non-academia

FRANCE



Accelerating collaborations within academia & industry

RCAAP - Portugal

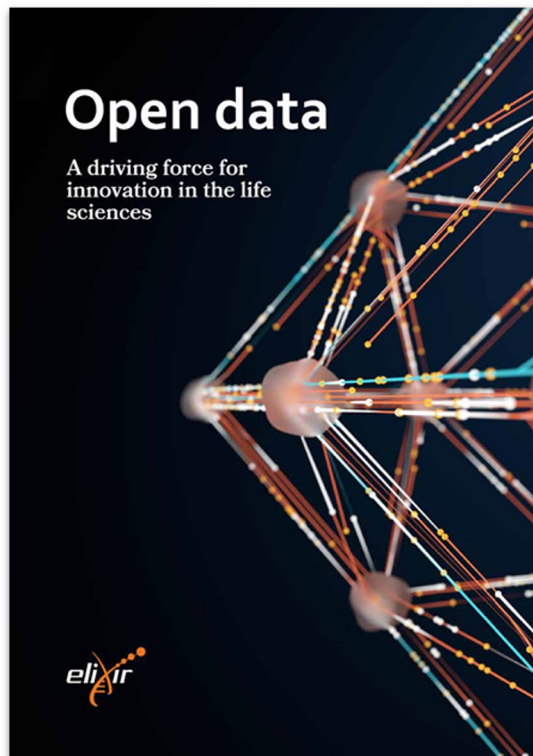


Universidade do Minho



Funded by the European Union

Open Data drives innovation in SMEs* (and beyond)



76%

of respondents stated that without data shared on open repositories, they would not be able to offer their product or service.

89%

of respondents stated that a product or service has more features because of access to data shared on open repositories

63%

63% of respondents stated that without access to registries, ontologies, and dictionaries published on open repositories, they would not be able to offer their product or service.

92%

of respondents stated that a product or service has more features because of access to registries, ontologies, and dictionaries shared on open repositories.

Report at <https://f1000research.com/documents/10-828>

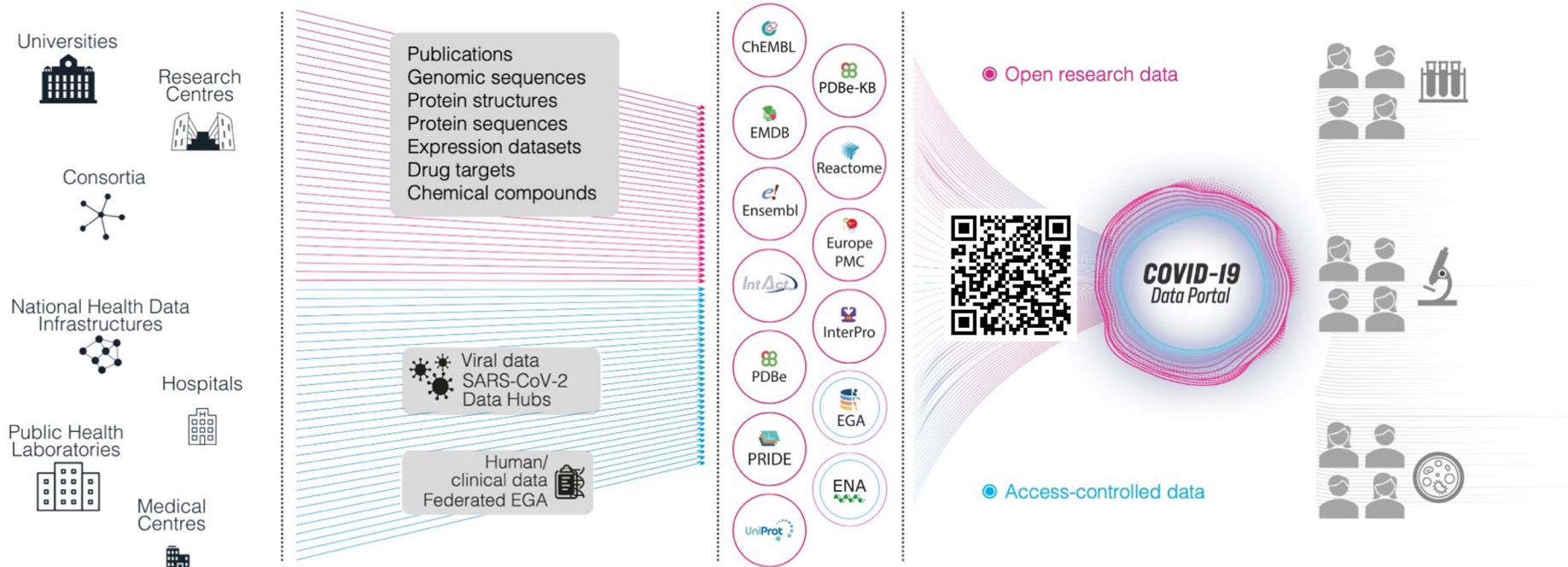
* Small and Medium-sized Enterprises

Industry value of infectious disease open data



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the European Union

The European COVID-19 Data Portal



<https://www.covid19dataportal.org>

Report on industry value of infectious disease data

Aim to understand: 1) the usage of COVID-19 data by industry

2) the importance of open data and research infrastructures in innovation

3) give visibility to companies that acknowledge usage of Open Biodata Resources

Challenge: We do not know who is using us and for what

Method: Quantitative data on patents and publications + Qualitative data (interviews)

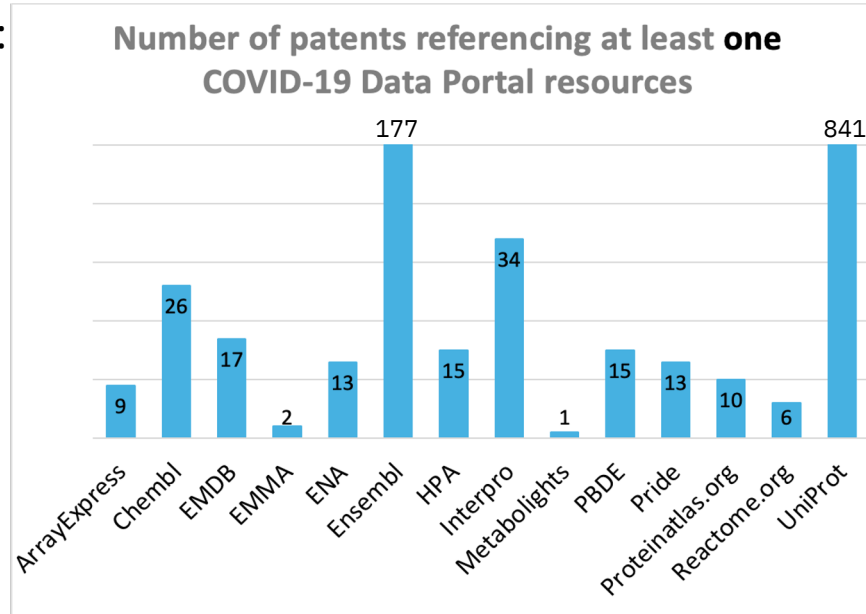
Findings:

- >1,000 patents reference at least one of the COVID-19 Data Portal resources
- 363 publications referencing the COVID-19 Data Portal, with 23 affiliated companies
- interviews pointed at the importance of adaptability and public-private collaborations

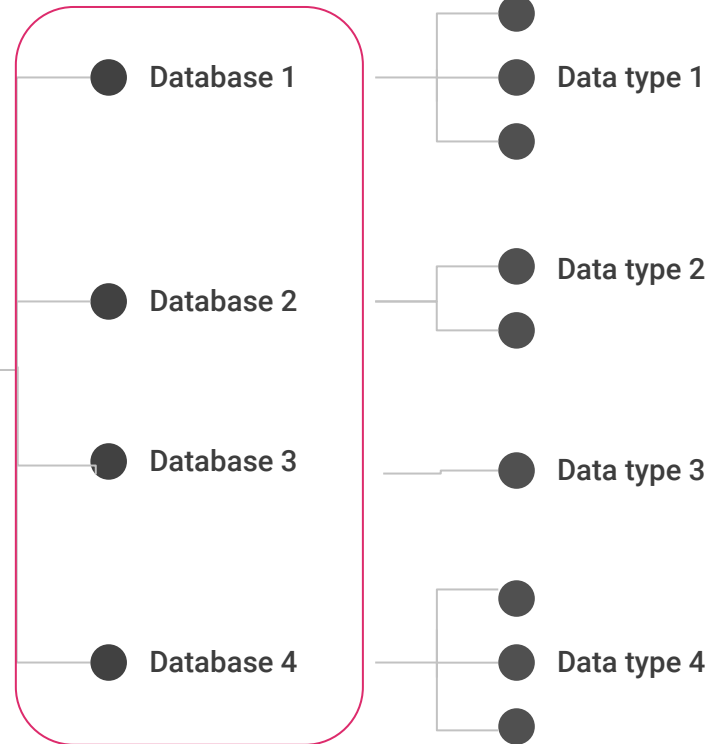
What is used?

At least 5% of the total COVID patents (1179 patents) reference at least **one** of the COVID-19

Data Portal resources:



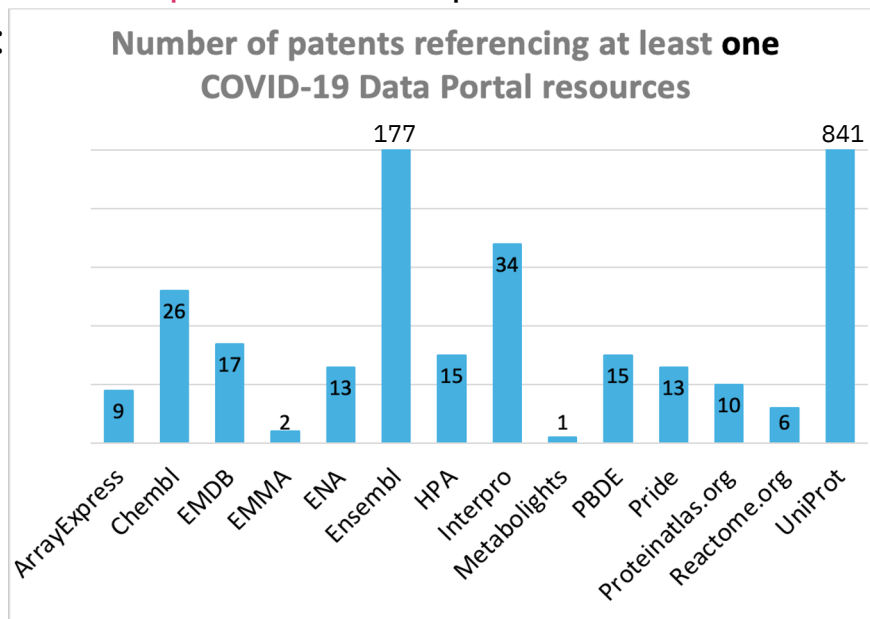
COVID-19 DATA PORTAL



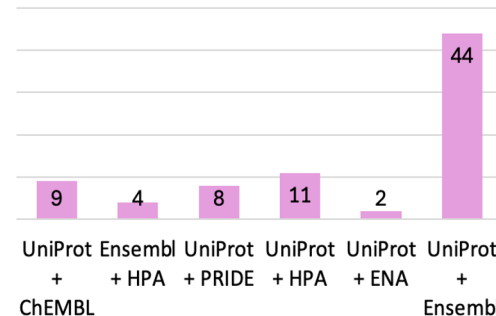
What is used?

At least 5% of the total COVID patents (1179 patents) reference at least **one** of the COVID-19

Data Portal resources:



Number of patents referencing at least **two** COVID-19 Data Portal resources



0.4% of the total COVID patents (78 patents) reference **two** resources:

0.07% of the total COVID patents (16 patents) reference **three** resources

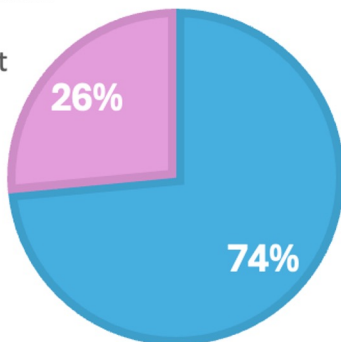
How it is used?

These 1179 patents:

- include 86 active patents
- were cited 1855 by other patents
- have 122 companies as applicants

■ No-industry applicant

■ Industry applicant

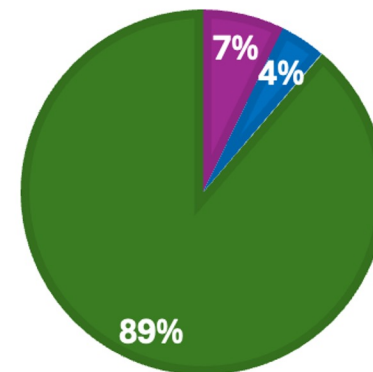


LEGAL STATUS OF EXTENDED FAMILIES PATENTS

■ Active

■ Discontinued/Inactivated

■ Pending



The most cited patents are from industry:

Uniprot	Coronavirus vaccine formulations	54 citations	Active	NOVAVAX INC*
Ensembl	Spatial detection of SARS-COV-2 using templated ligation	53 citations	Pending	10X GENOMICS INC*

From whom it is used?

122 companies were applicants of 284 patents that reference at least one open resource of the COVID-19 Data Portal. From these companies:

- 22% have headquarters based in the Europe
- 15% are large enterprises
- 50% have more than one patent
 - Mammoth Biosciences & BioNTech were found with 13 and 12 patents in this search

Sector	Large enterprise	SME
Pharmaceuticals	12	47
Biotechnology	1	38
Genomics	1	8
Vaccines	2	4
Healthcare		4
Diagnostics	2	1
Technology	1	
AI		1

Scientific articles of the COVID-19 data portal

17 articles with authors from 25 for-profit companies
(out of 363 that reference the COVID-19 data portal).

The most cited publication
(356 citations) had 255 authors:

The National COVID Cohort Collaborative (N3C): Rationale, design, infrastructure, and deployment	Janssen
	TriNetX
	IQVIA

mentions the portal as a “great example of *international collaboration for building infrastructure for a global approach*”

PathOS

Open Science Impact Pathways



Innovation from
open research
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Bioinformatics



Open science
practices during
the Covid-19
pandemic

COVID-19



Fostering
innovation in
climate change -
Horizon 2020

Climate



Open science on
remedying
structural
inequalities

Gender



Effects of open
research data from
a national
repository

EASY – The
Netherlands



Research data and
knowledge use /
uptake in non-
academia

FRANCE



Accelerating
collaborations
within academia &
industry

RCAAP -
Portugal



Funded by
the European Union

Assessing the use and value of an ELIXIR resource through Cost-Benefit analysis



Main findings for industrial usage through a survey:

- 103 industry responses (25% of total), most from large enter. & principles investigators
- Time spent: in data analysis 10-50%, in data management <30%, most access weekly
- Most seem to base their product and services on a pool of data, including UniProt
- If UniProt did not exist, access through another Open Science resource (lower quality)
- Most “research would be less good, more time consuming, expensive, but still possible” (except of micro companies)
- The larger the company the more time wasted in ad-hoc agreements for another resource

Overall conclusions



- The **Open biodata resources** are well integrated in the industrial R&D sector
 - 5% of COVID-19 **patents** reference at least one BY-COVID Data Portal resources
 - As far as a resource is integrated in academic practices is also in industrial practices

Report available online: <https://zenodo.org/records/13889809> or scan the QR code:



ELIXIR's impact-related resources



<https://doi.org/10.7490/f100research.1119614.1>



<https://doi.org/10.7490/f100research.1119654.1>



<https://handbook.pathos-project.eu/>



<https://f1000research.com/articles/12-88/v1>



Thank you for your attention

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