



PaNFinder @ ICAT F2F

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ESRF

F.A.I.R

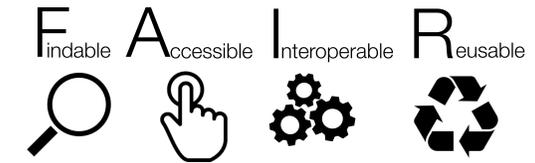
- ✓ Findable
- ✓ Accessible
- ✓ Interoperable
- ✓ Reusable

Without the F, your (meta) data is just AIR.

Finding the relevant data is the first step of (re)using data.

Powered by EU

Several EU initiatives to promote F.A.I.R principles, a cornerstone to enable open science.



Predecessor - PaNOSC Data Portal

Federated search across multiple European neutron & photon facilities

Challenges

- ◆ ExPaNDS project ended
- ◆ Unreliable connection between federated and local search APIs
- ◆ Meta data definition differs between facilities
- ◆ Non-intuitive user input
- ◆ Unresolved issues, e.g. filters

✓ What is next?



- European Synchrotron Radiation Facility
- European Spallation Source
- Institut Laue Langevin
- MAX IV
- Paul Scherrer Institut
- Central European Research Infrastructure Consortium
- European XFEL
- ALBA Synchrotron
- Helmholtz-Zentrum Dresden-Rossendorf

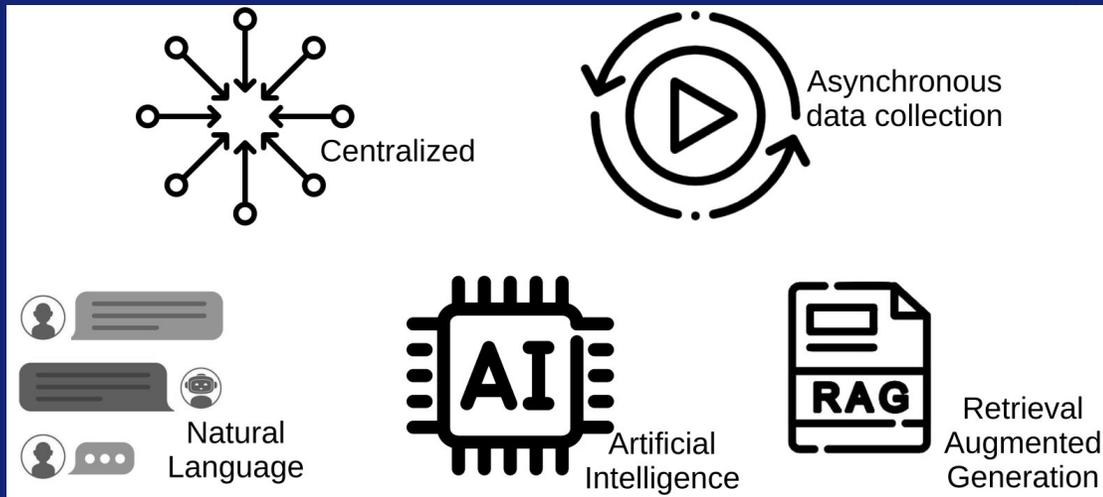
A screenshot of the PaNOSC search interface. The search bar contains 'covid lung' and shows '23 documents found'. On the left, there are filter sections for Facility (set to 'all'), Chemical Formula, Incident Wavelength (min, max, nm), Incident Photon Energy (min, max, eV), Temperature (min, max, K), and Pressure (min, max, Pa). The search results list three documents, each with a title, a snippet, and a release date of January 1st 2023 by PSI. The first document title is 'Watching the release of a photopharmacological drug from tubulin using time-resolved serial crystallograph...'.

Funding

- ✓ EOSC OSCARS
- ✓ Consolidates past achievements of the science clusters
- ✓ 2 Years, 2025 / 2026



Requirements



Team

- ✓ Max Novelli and the SIMS Team
- ✓ Notable mention: Janos Babik
- ✓ DMSC - ESS



Idea

- ◆ Natural language query to find resources
 - ◆ URL, Datasets, Research Facilities
- ◆ ChatGPT-like interpretation and explanation of results

Current Status

- ✓ Beta Version
- ✓ <https://pan-finder.panosc.eu>
- ✓ <https://pan-finder.panosc.ess.eu/pan-finder>

PANFINDER: FUNCTIONALITY

Show me all data doing research about a lung that was infected with covid



Most Relevant Documents

DOI	Title	Facility	Relevance
10.15151/ESRF-ES-...	Insight into effects of COVID-19 on human heart and lung tissue at sub-cellular level	ESRF	90%

Relevance Explanation

This document provides a detailed investigation of COVID-19-induced damage in lung and heart tissues at the cellular and sub-cellular levels using advanced X-ray cryo-nano-holotomography. It **directly addresses** the structural changes in lung tissue caused by terminal COVID-19 infection, offering high-resolution 3D data from autopsy samples. This insight into tissue architecture alterations is particularly relevant for understanding the impact of COVID-19 on lung pathology.

Was this what you were looking for?

DOI

10.15151/ESRF-ES-436648953

Title

Insight into effects of COVID-19 on human heart and lung tissue at sub-cellular level

Facility

ESRF

Abstract

COVID-19 affects multiple vital organs and leads to drastic changes in tissue architecture not only in the lung but also in the heart. The understanding of these alterations is currently very limited and no high resolution 3D data is available. We propose to investigate damage in heart and lung tissue from patients having died with COVID-19 and who have undergone autopsy. This will be achieved by X-ray cryo-nano-holotomography. The aim of the proposal is to reveal the 3D changes occurring in tissue at cellular and sub-cellular levels, following terminal COVID-19 infection.

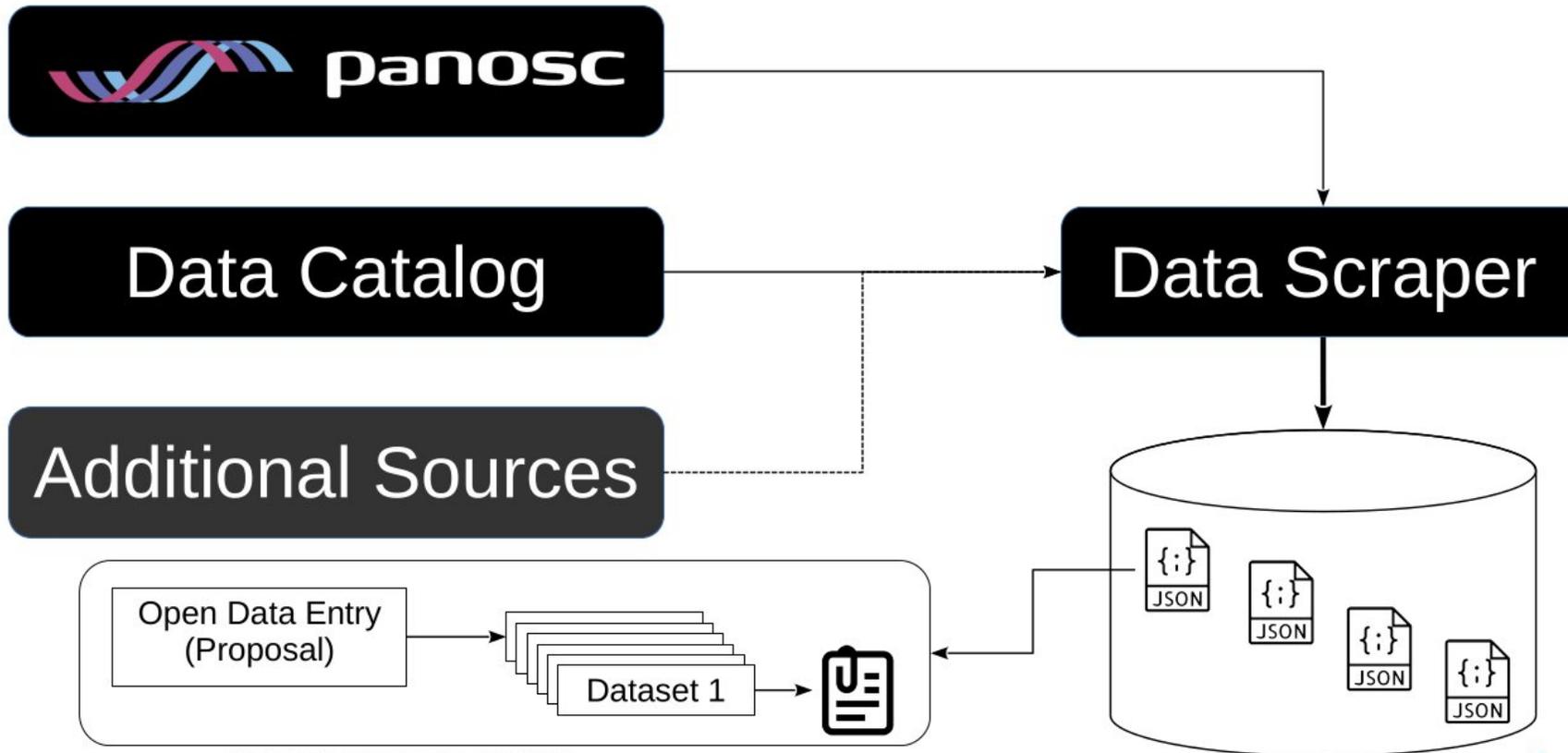
Show Raw Data

>	10.15151/ESRF-ES-...	Multiscale Quantification of Covid-19's impact on lung vasculature from whole lobe to alveolar/microvascular scales	ESRF	89%
>	10.15151/ESRF-ES-...	Multiscale Quantification of Covid-19's impact on lung vasculature from whole lobe to alveolar/microvascular scales	ESRF	78%
>	10.15151/ESRF-ES-...	Multiscale Quantification of Covid-19's impact on lung vasculature from whole lobe to alveolar/microvascular scales	ESRF	78%

Suggested Documents

DOI	Title	Facility	Relevance
> 10.15151/ESRF-ES-...	Towards the understanding of the Interaction between the Spike Fusion Region and the cell Plasma Membrane	ESRF	41%

Data Collection



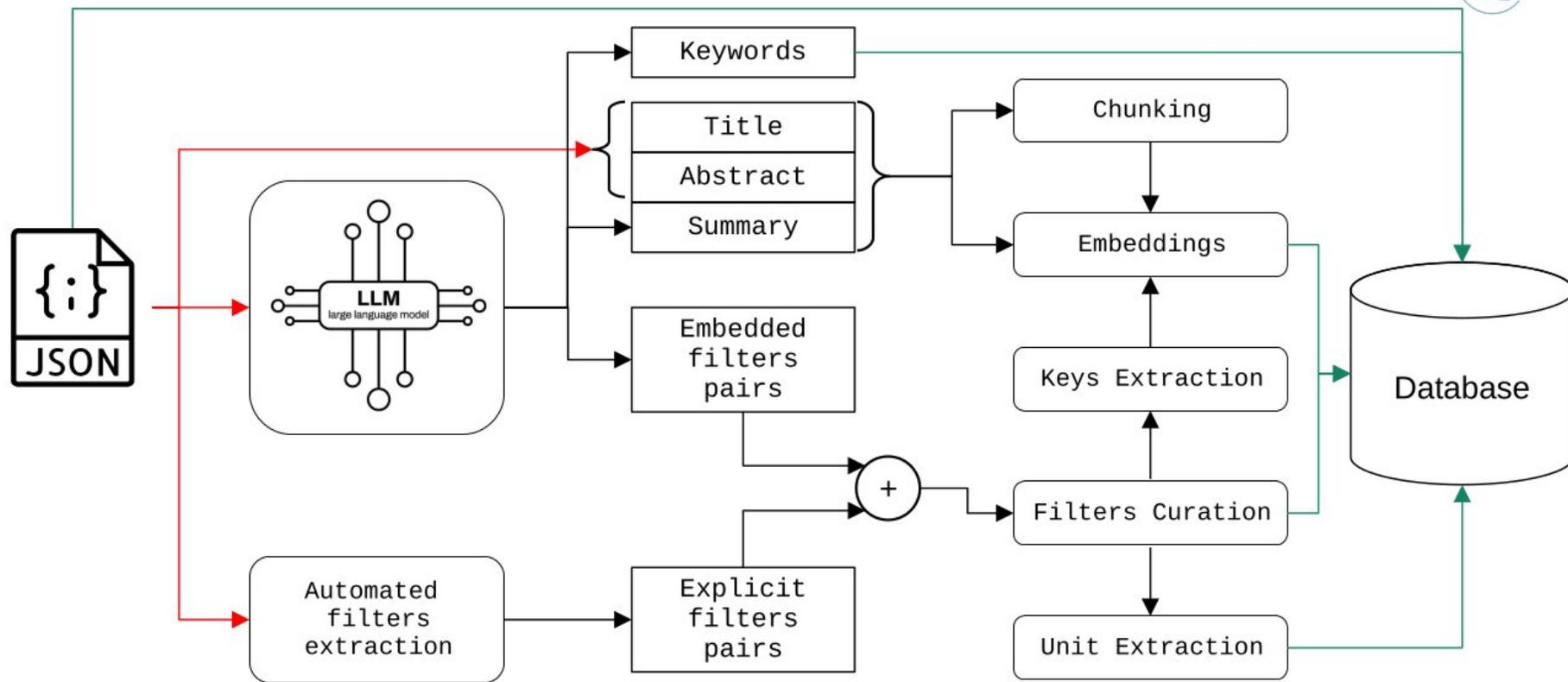
DAPHNE4NFD1 LECTURE SERIES - 2025/10/28

12

<https://zenodo.org/records/17471792>

Author : Max Novelli

Data Ingestion



DAPHNE4NFDI LECTURE SERIES - 2025/10/28

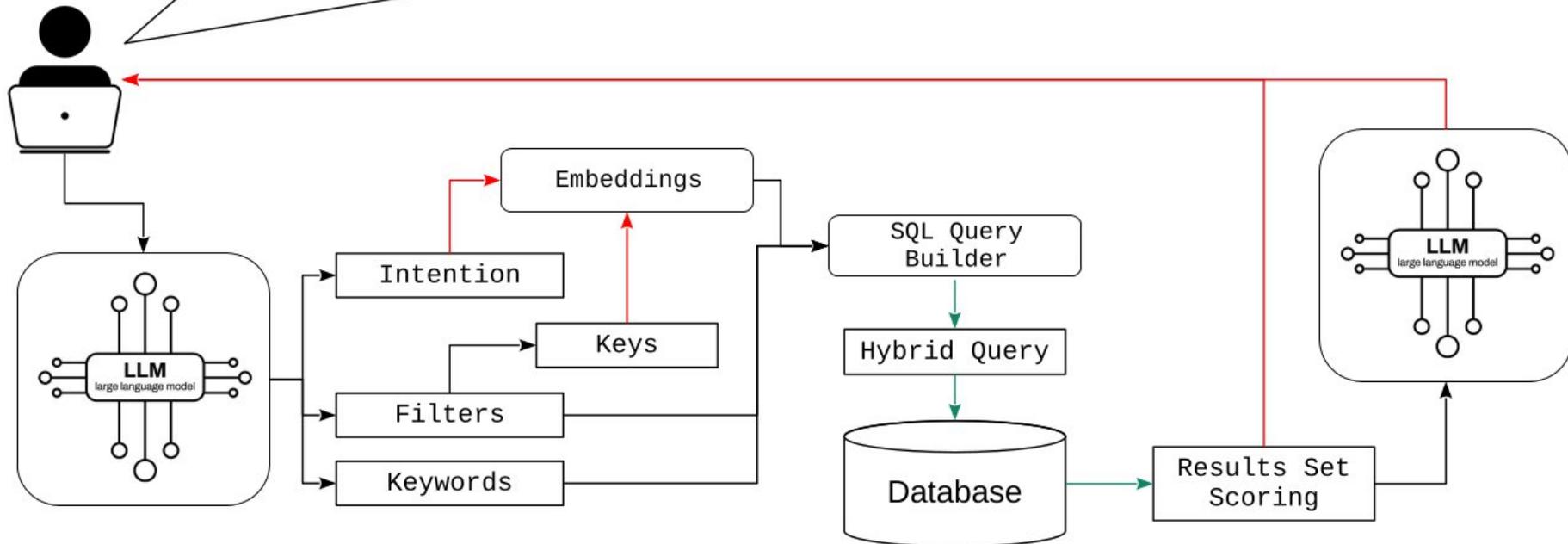
13

<https://zenodo.org/records/17471792>

Author : Max Novelli

User journey

I'm writing a new proposal for a new experiment to study the changes in molecular structure of a new synthetic carbon based material bonding with human blood red cells. I'm interested in running the experiments at a normal human body temperature. Can you show me related publications and similar proposals? Have similar experiments already been conducted?



DAPHNE4NFD1 LECTURE SERIES - 2025/10/28

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<https://zenodo.org/records/17471792>

Author : Max Novelli

ESS

- Benchmarking
- More testing
 - Different models (size, cost, performance)
 - Prompt engineering
 - Model fine tuning
 - Refine natural language response
- Automating data collection
- **User feedback:**
 - **1-on-1 sessions, answers validation, and more**
 - **Volunteers needed!**
- **November 2026: Go public as part of deliverable**

ESRF

- ✓ Two day knowledge transfer with Max and Janos (January 2026)
- Install PaNFinder locally and tailor to ESRF needs:
 - Manage authorization for embargoed data
 - Link documents to datasets OR samples
 - Utilize existing controlled dictionaries to standardize terminology
 - Implement live data ingestion via API
 - Test performance: currently thousands of documents, we would need hundreds of millions
- Additional ideas
 - ML for meta data with goals: decision making, quality or timing. Example: increase experiment efficiency and quality based on existing meta data
 - MCP (Model Context Protocol): Provides structured context to AI/ML models to improve analysis
 - LLM to generate the context for ML, MCP etc.

ACKNOWLEDGEMENTS

Some content and graphics from :
<https://zenodo.org/records/17471792>
Author : Max Novelli

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QUESTIONS ?

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THANKS FOR YOUR ATTENTION