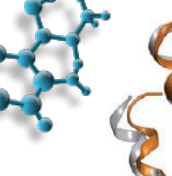
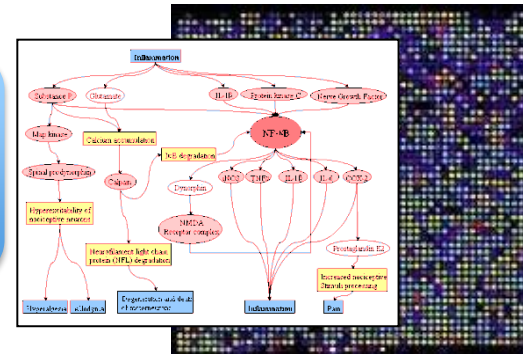


The diagram illustrates the integration of three data sources into healthcare. On the left, a stack of books represents 'Biomedical literature'. In the center, a blue rounded rectangle contains the text 'Clinical Data'. On the right, a blue rounded rectangle contains the text 'Biomedical imaging'. These three elements are connected by lines to a central point, which then leads to a large blue rounded rectangle on the far right labeled 'HEALTHCARE'. Above this final rectangle is a circular icon of a doctor holding a clipboard and a laptop.



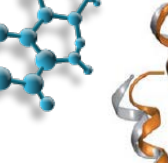
'omics & Systems Biology



23 million scientific papers
referenced in PubMed®, and more
than 700,000 are added each year



Biomedical imaging



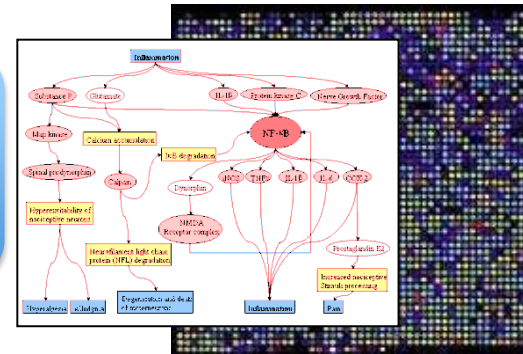
The diagram illustrates the metabolic pathways of indole. It starts with 'Indole' at the top, which branches into 'Indole-3-Pyruvate', 'Indole-3-Pyruvate', 'Indole-3-Pyruvate', and 'Indole-3-Pyruvate'. These lead to 'Indole-3-Pyruvate', 'Indole-3-Pyruvate', 'Indole-3-Pyruvate', and 'Indole-3-Pyruvate'. The pathways involve various enzymes like 'Indole-3-Pyruvate', 'Indole-3-Pyruvate', 'Indole-3-Pyruvate', and 'Indole-3-Pyruvate'. The final products are 'Indole-3-Pyruvate', 'Indole-3-Pyruvate', 'Indole-3-Pyruvate', and 'Indole-3-Pyruvate'.



Millions
can be reached

Biomedical imaging

'omics &
Systems
Biology



Biomedical data that can be reused for research

Clinical Data



Biomedical literature



Biomedical imaging

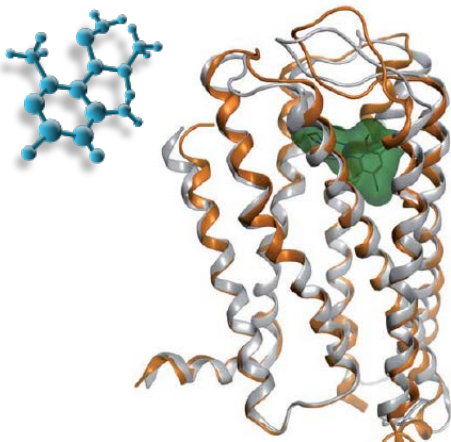


Estimated biomedical imaging worldwide in 2020: $3.5 \cdot 10^{22}$ bytes

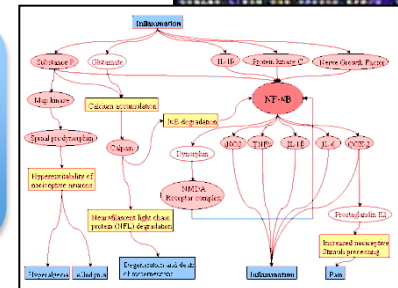
S. Sarcar. GE Healthcare.

<http://es.slideshare.net/sarcar/data-explosion-in-medical-imaging>

Drugs & other chemicals



'omics & Systems Biology



Biomedical data that can be reused for research

Clinical Data



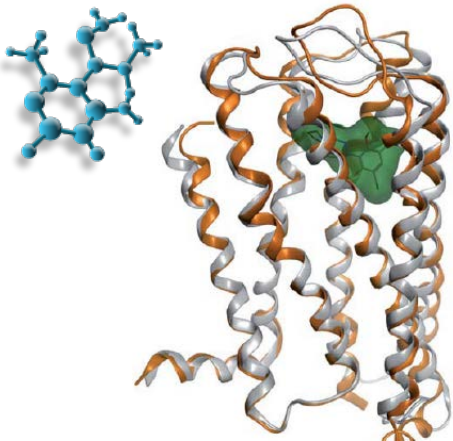
Biomedical literature



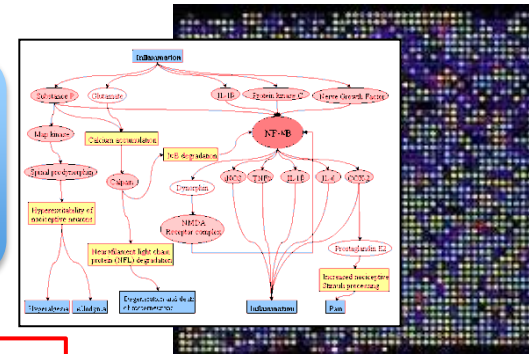
Biomedical imaging



Drugs & other chemicals



'omics & Systems Biology



The genome of a person contains
> 3,000 M base pairs {G,A,T,C}

Biomedical data that can be reused for research

Clinical Data



Biomedical literature

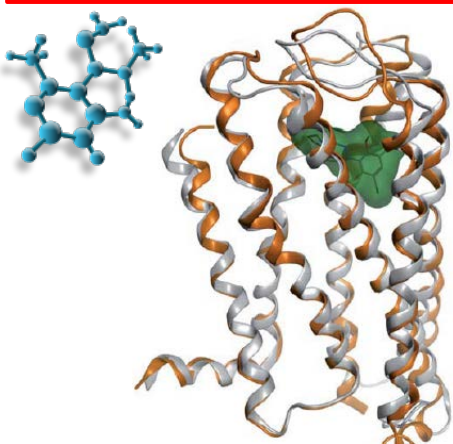


Biomedical imaging

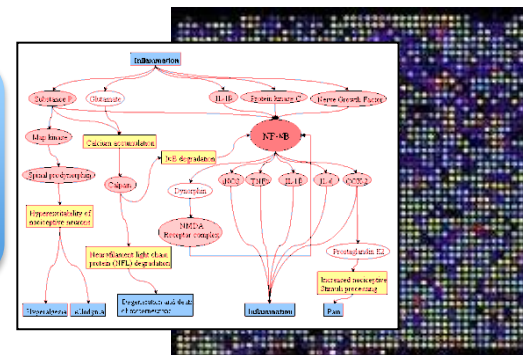


ChEMBL: > 10K targets; >1.4M compounds; >12.8M activities

Drugs & other chemicals



'omics & Systems Biology



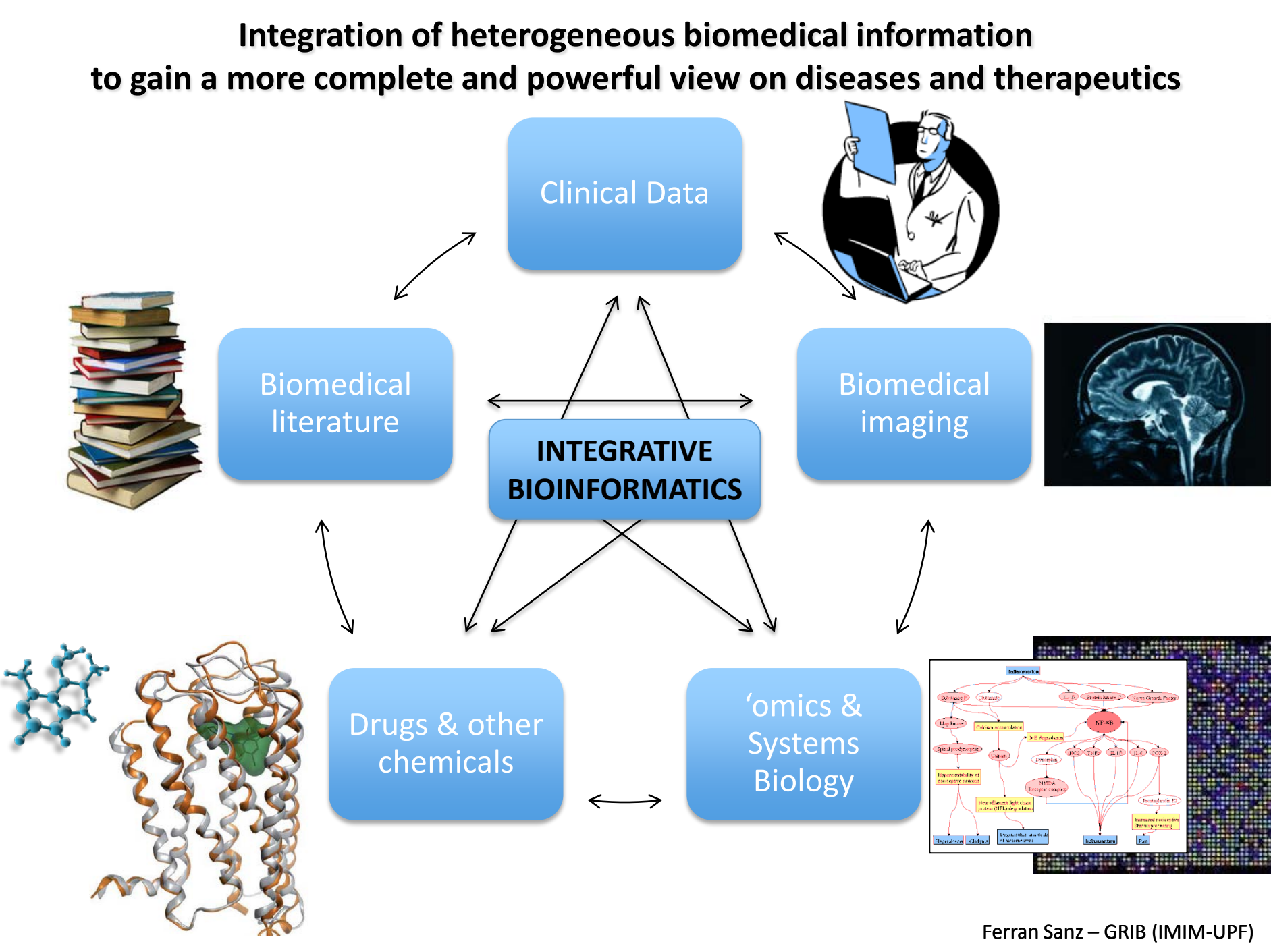
Integration of heterogeneous biomedical information to gain a more complete and powerful view on diseases and therapeutics

The diagram illustrates the integration of heterogeneous biomedical information to gain a more complete and powerful view on diseases and therapeutics. The central concept is **INTEGRATIVE BIOINFORMATICS**, which acts as a hub connecting five key data sources:

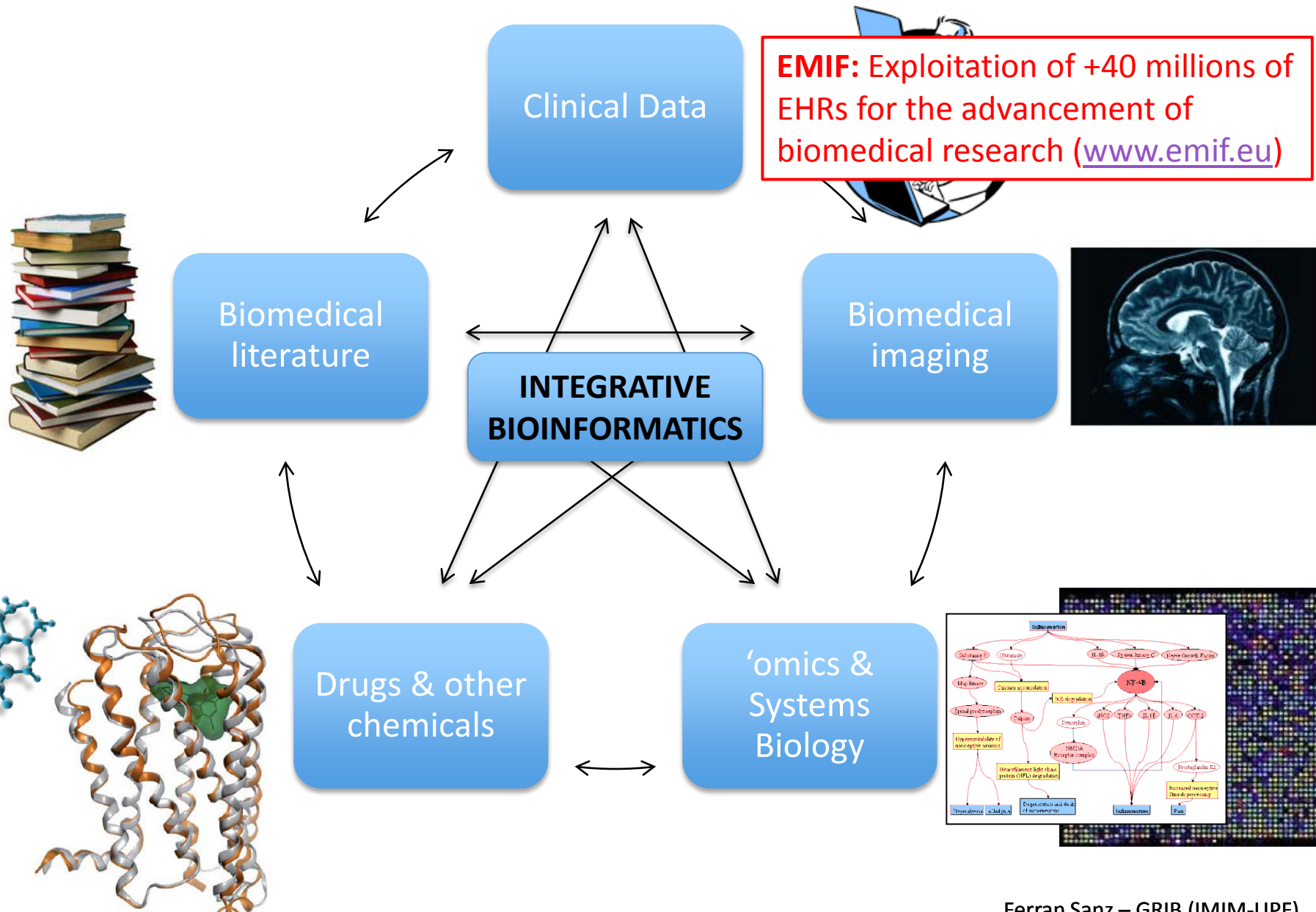
- Clinical Data**: Represented by an icon of a doctor with a laptop.
- Biomedical literature**: Represented by an icon of a stack of books.
- Biomedical imaging**: Represented by an icon of a brain scan.
- Drugs & other chemicals**: Represented by an icon of a molecular structure.
- omics & Systems Biology**: Represented by an icon of a protein structure.

Arrows indicate the flow of information and integration between these sources and the central hub. A small inset diagram in the bottom right corner shows a complex network of biological interactions, including pathways like the PI3K/AKT/mTOR pathway and the Wnt/PCP pathway.

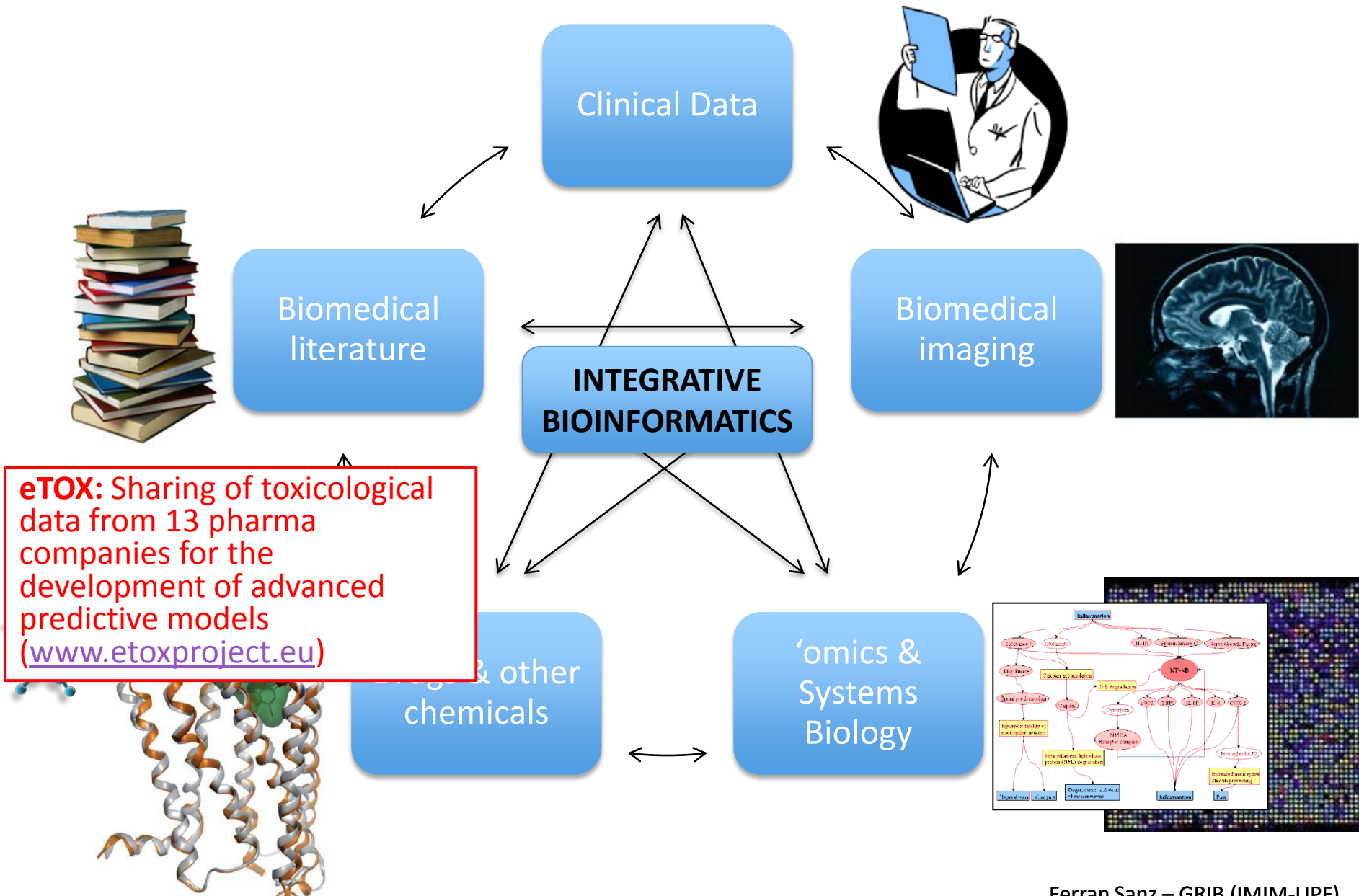
Ferran Sanz – GRIB (IMIM-UPF)



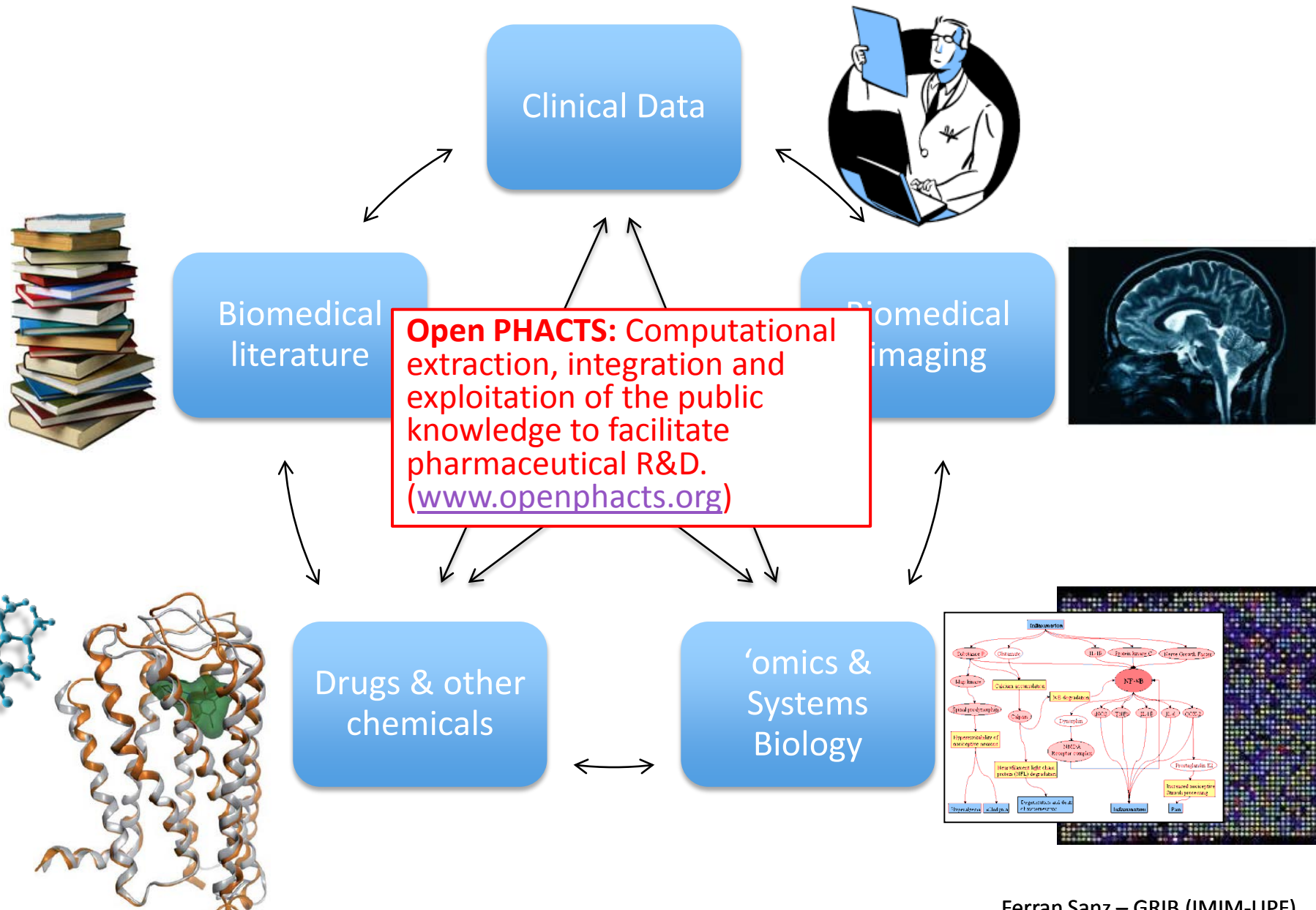
Examples of IMI projects on integrative knowledge management



Examples of IMI projects on integrative knowledge management



Examples of IMI projects on integrative knowledge management



DisGeNET

- A comprehensive resource on gene-disease associations
- Integrates information from publicly available databases and the literature (text mining)
- Freely available at: <http://ibi.imim.es/DisGeNET>