Challenges in Data Exploration for Translational Research: The use of Large Language Models to Translate Scientific Knowledge into Clinical Applications

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Identifying the Problem

In translational research, **exploring data** is a major challenge because:

- There is a need to analyze large amounts of data from different fields, like genomic data, clinical trial results, or medical images.
- This data often uses very technical language, which makes it hard to understand and apply the findings quickly in real healthcare situations.

Exploring the solution

Large Language Models (LLMs) can help address the challenges of **data exploration** in translational research in several ways:

- Translate complex scientific language into simpler terms.
- Conduct efficient literature review
- Identify potential applications and treatment options
- Integrate multidisciplinary knowledge
- Generating new hypotheses and recommendations

Barriers to Implementation

- Mitigate hallucinations and inaccuracies
- Address limited domain expertise
- Ensure interpretability and transparency
- Manage computational cost and scalability
- Handling ethical and privacy concerns

Figure: Translational research data architecture

Thanks!

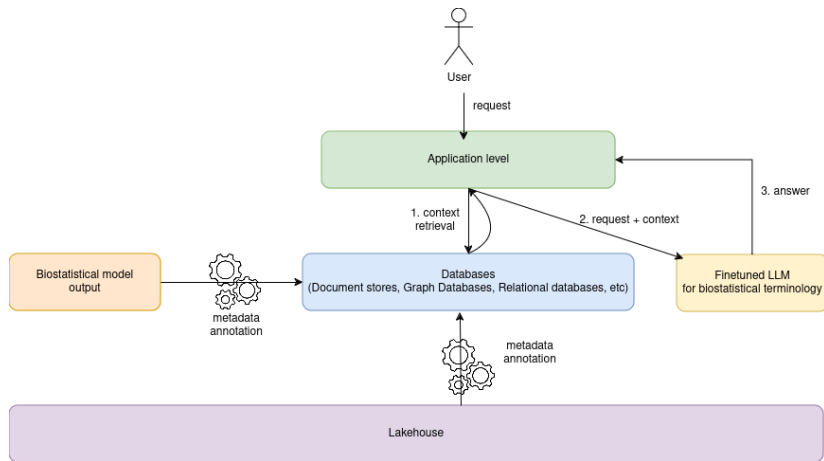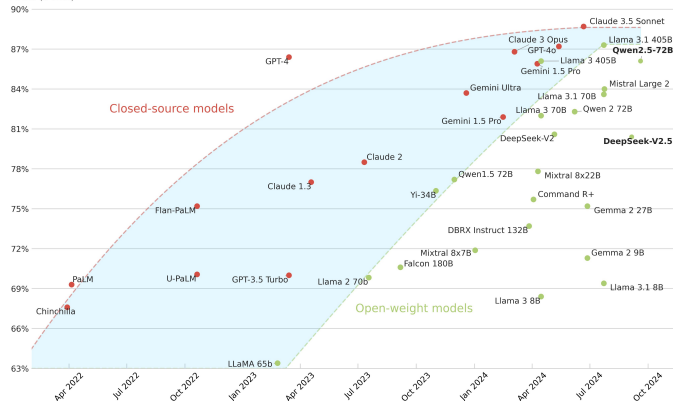Figure: Selection of the LLM [1]

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[1] https://x.com/maximelabonne/status/1838170077021053004