

# Pharma's Next Evolution

Doctors Empowered.

Prof. Ching-Yung Lin E6893 Big Data Analytics  
Team 21: Dan Harvey, Ishraq Khan, Berk Yilmaz



COLUMBIA UNIVERSITY  
IN THE CITY OF NEW YORK

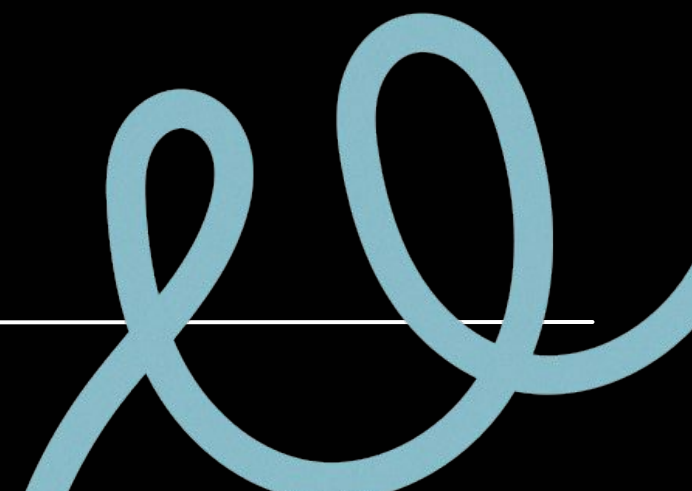
# Feel your best.

## Doctors Empowered.



### PharMe

- Latest treatments at your doctor's fingertips
- Safe, FDA Proven Treatments
- Updated Daily
- ML Driven



# DATA

## Datasets

- **MIMIC-III Clinical Database**

<https://physionet.org/content/mimiciii/1.4/>

MIMIC-III is a large, freely-available database comprising de-identified health-related data associated with over forty thousand patients who stayed in critical care units of the Beth Israel Deaconess Medical Center between 2001 and 2012.

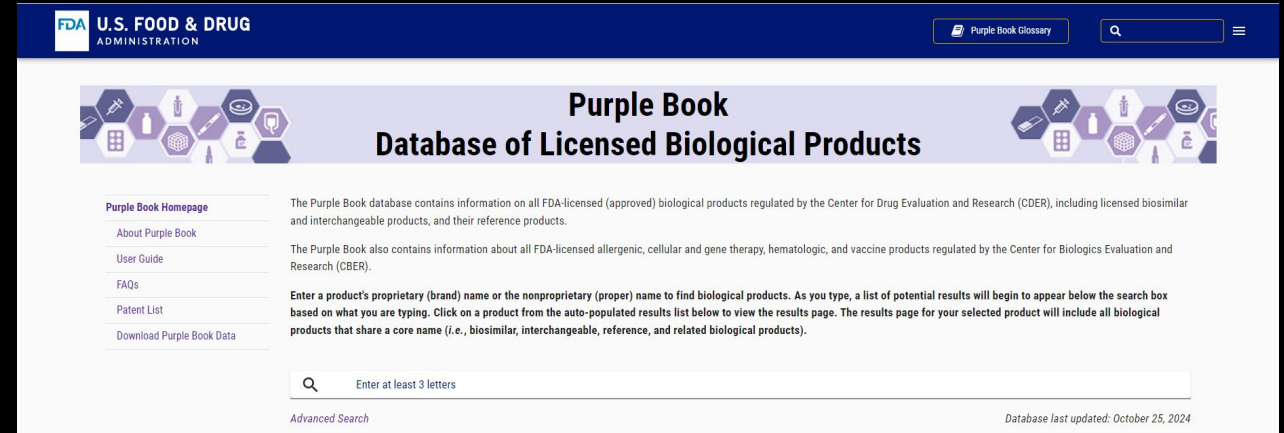
- **PubMed**

<https://pubmed.ncbi.nlm.nih.gov/>

PubMed is a free resource supporting the search and retrieval of biomedical and life sciences literature with the aim of improving health—both globally and personally.

## FDA's Purple Book

- **Real-time updates** from the FDA's Purple Book

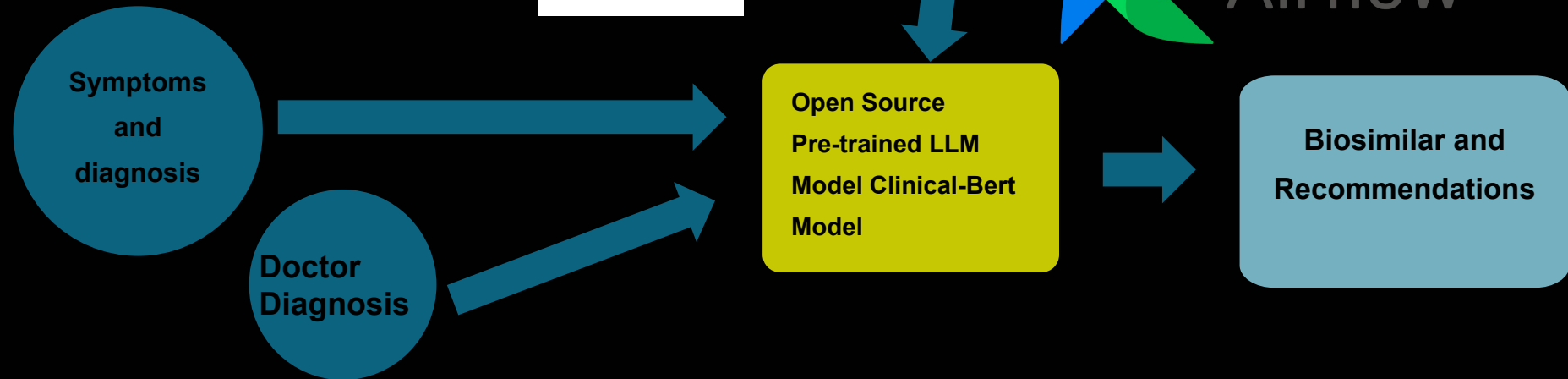


The screenshot shows the FDA's Purple Book website. The header features the FDA logo and the text "U.S. FOOD & DRUG ADMINISTRATION". A navigation bar includes a "Purple Book Glossary" link and a search bar. The main content area is titled "Purple Book Database of Licensed Biological Products". It contains a sidebar with links: "Purple Book Homepage", "About Purple Book", "User Guide", "FAQs", "Patent List", and "Download Purple Book Data". The main text area provides information about the database, stating it contains information on all FDA-licensed (approved) biological products regulated by the Center for Drug Evaluation and Research (CDER), including licensed biosimilar and interchangeable products, and their reference products. It also mentions that the database contains information about all FDA-licensed allergenic, cellular and gene therapy, hematologic, and vaccine products regulated by the Center for Biologics Evaluation and Research (CBER). A search box is present with the prompt "Enter at least 3 letters". At the bottom, there are links for "Advanced Search" and "Database last updated: October 25, 2024".

# System Architecture



FDA's Purple  
Book



Doctor Input  
"Diabetes Mellitus"  
"Normal Labs"  
"BMI: WNL"  
"No GI Problems"

## pharMe Output

Drug	Indication	Side Effects
Metformin	First-line treatment for type 2 diabetes, improves insulin sensitivity and lowers blood glucose levels.	May cause gastrointestinal discomfort, nausea, and diarrhea.
Sulfonylureas (e.g., Glipizide)	Stimulates insulin release in type 2 diabetes patients with some residual beta-cell function.	Risk of hypoglycemia and weight gain.
GLP-1 Agonists (e.g., Liraglutide)	Lowers blood glucose and supports weight loss in type 2 diabetes; mimics incretin hormone.	Nausea, vomiting, and possible risk of pancreatitis.

# Future Development / Potential

## Linking to Clinical Outcomes Data

Use data from insurance claims to  
validate safety and efficacy of  
biosimilars

## In-Depth Comparisons

Go beyond simple identification  
and provide detailed analysis on  
differences between products

## Model Improvements

Expand data sources to find more  
potential biosimilars

## Educational Resources

Provide education platform for  
providers to identify differences  
between biosimilars



# References

- Solutions, E. C. (2021, September 8). *Determining which standard of “Food-Grade” coating your equipment should comply with can be confusing.* - Extreme Coating Solutions. Extreme Coating Solutions. <https://www.extremecoatingsolutions.com/standards-of-food-grade-coating-for-your-equipment/>
- 
- *FDA PurpleBook.* (n.d.). <https://purplebooksearch.fda.gov/>
- *MIMIC-III Clinical Database v1.4.* (2016, September 4). <https://physionet.org/content/mimiciii/1.4/>
- 
- *PubMed.* (n.d.). PubMed. <https://pubmed.ncbi.nlm.nih.gov/>

