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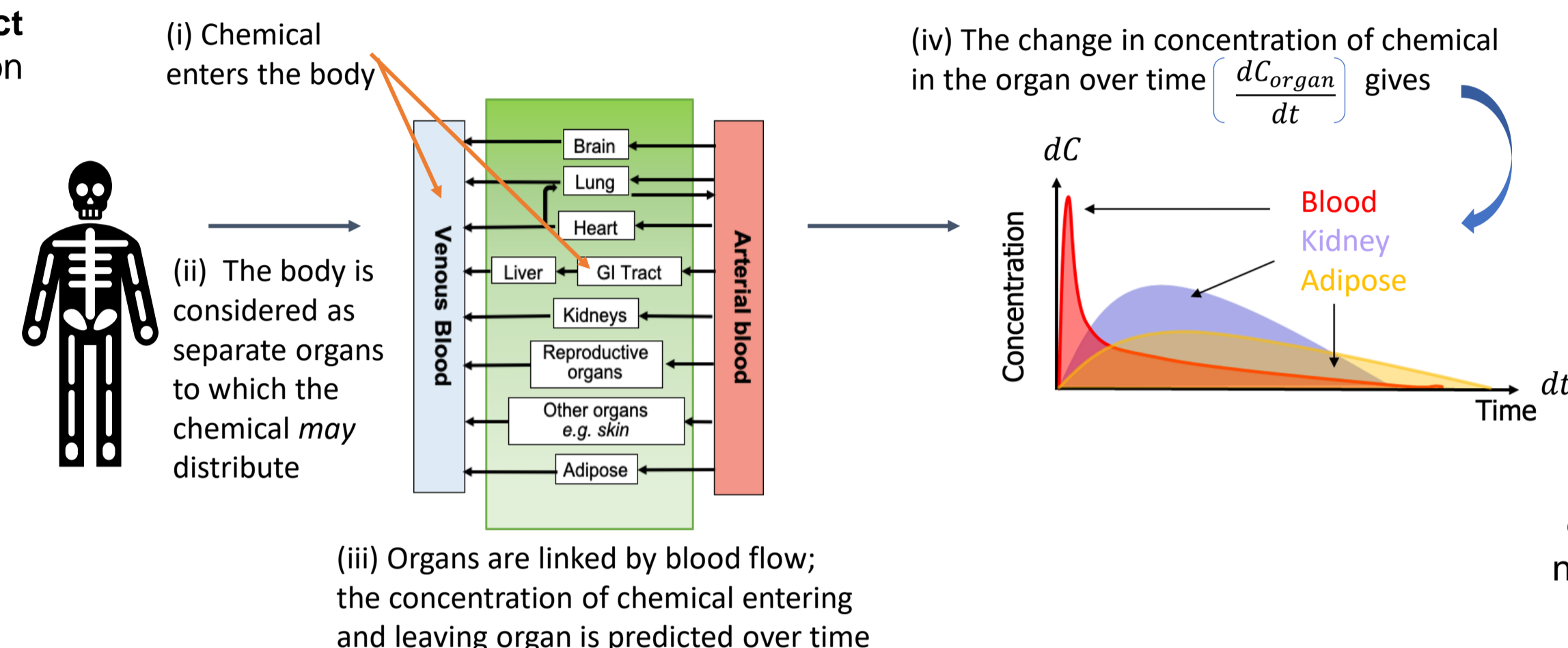
1. Background to PBK Models

- For any chemical to have an effect on the body it must be capable of eliciting an effect **and** reach its site of action (e.g. an organ).

Animals are used to **predict** the **effects of chemicals** on the body. We want to use **alternative approaches**.

Furthermore, to models that predict intrinsic effects of chemicals, we can use **PBK models** to **predict** how much of a chemical gets to each organ.

PBK models are **flexible** and **adaptable** to different species, life-stages, exposure routes and dosing scenarios.

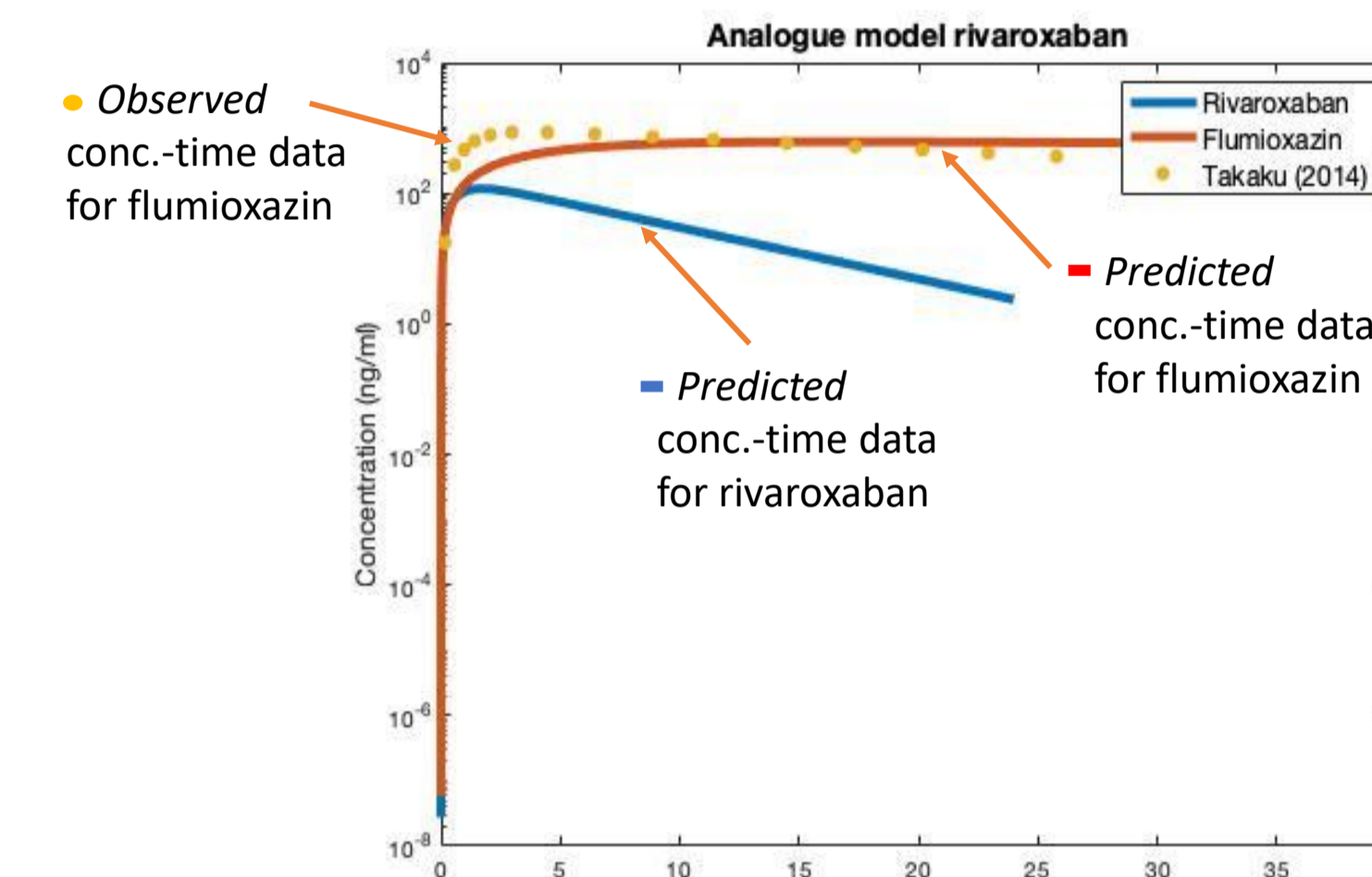


PBK model = Exposure scenario + Chemical information + Anatomical information

Dose	Molecular weight	Organ volume
Administration route	Solubility	Blood flow rates

3. Case Study

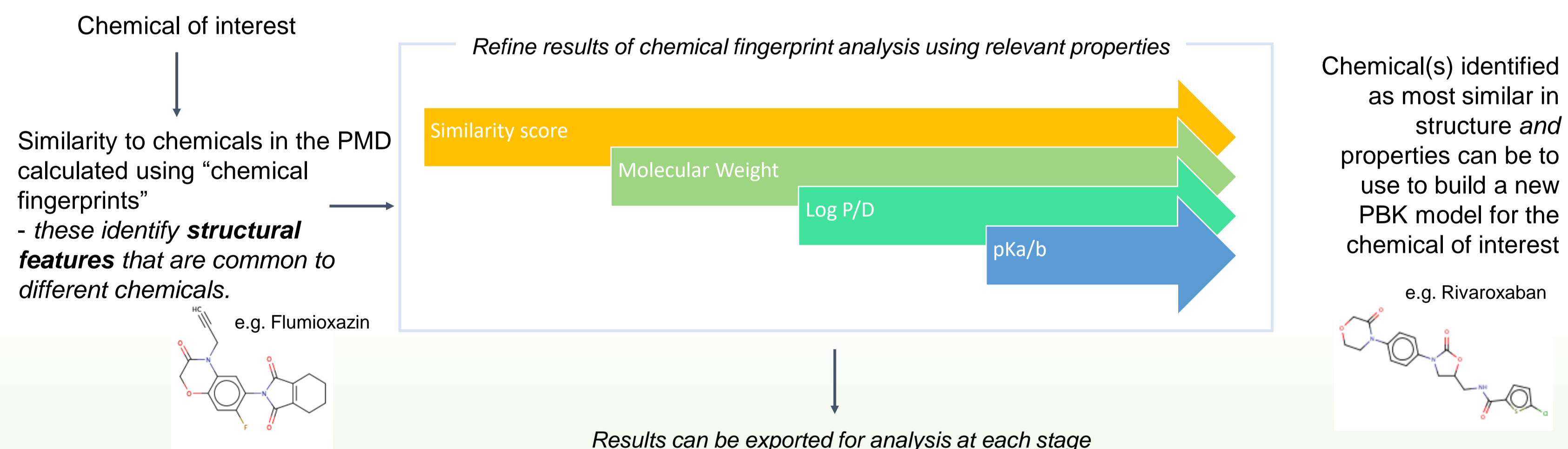
Using the tool, **rivaroxaban** was identified as a similar chemical to **flumioxazin**.



Comparisons to observed literature data for the chemical of interest (flumioxazin) was used to determine the accuracy of the simulations.

2. Similarity Tool

- Initially we created a **dataset of all available PBK models (PMD)**; this resource was used to create a **tool** that **determines similarity** of chemicals in relation to both **structure** and **chemical properties**.



- Once we have determined the most "similar" chemical we use the PBK model for that (data-rich) chemical to help build a new model for the chemical we did not have a model for (the data-poor chemical).

4. Conclusions

The similarity tool has **successfully** been used for **multiple case studies** (with industry) including this case study for flumioxazin.

The results show that information from one PBK model can be used, with caution, to **assist the development of a PBK model** for another chemical that lacks data.

Thus, we can use existing data to make **predictions** of the potential effects of chemicals; this helps to **reduce, refine and replace animals used in experiments**.

