

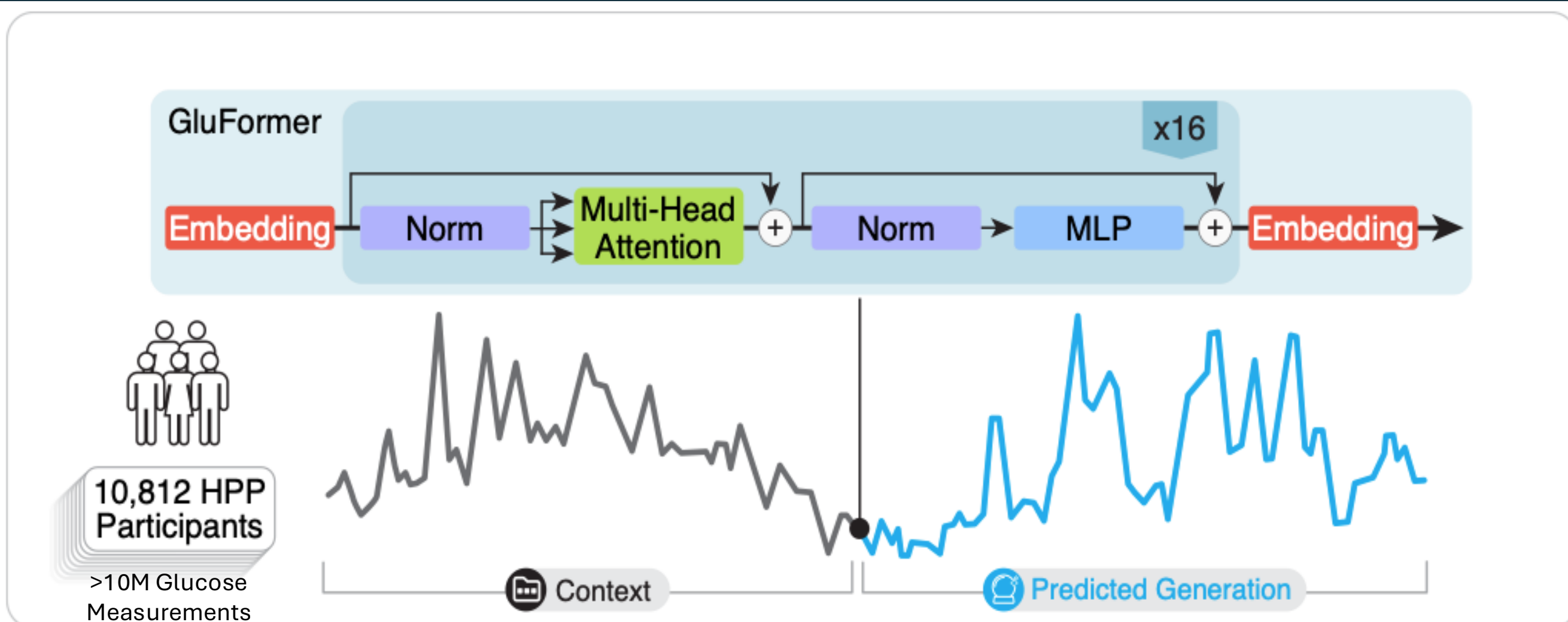
CGM Foundation Model Trained on Largest Healthy Cohort Outperforms Medical SOTA at Diabetes Prediction

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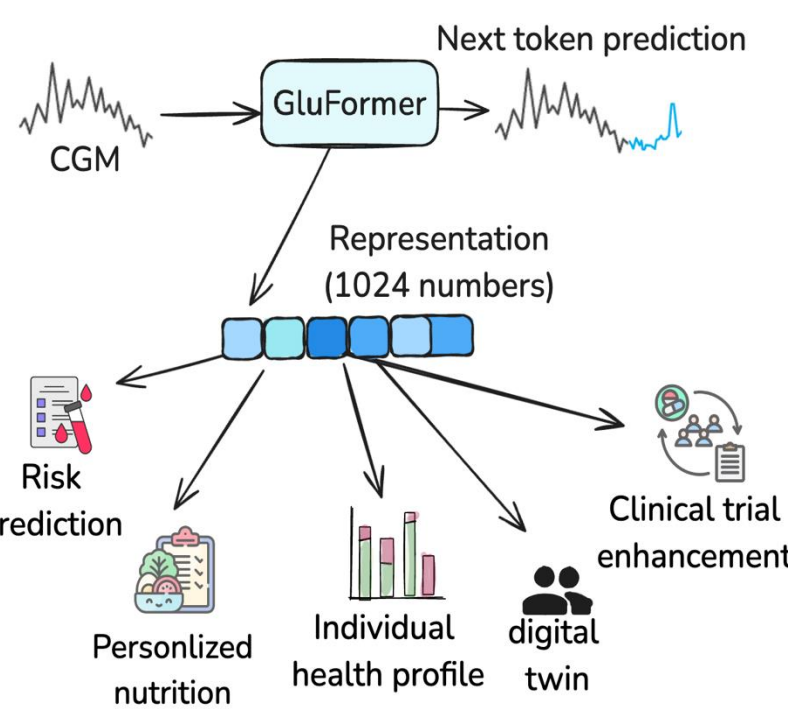
¹ Weizmann Institute of Science ² NVIDIA ³ Pheno.AI

1. Main Idea

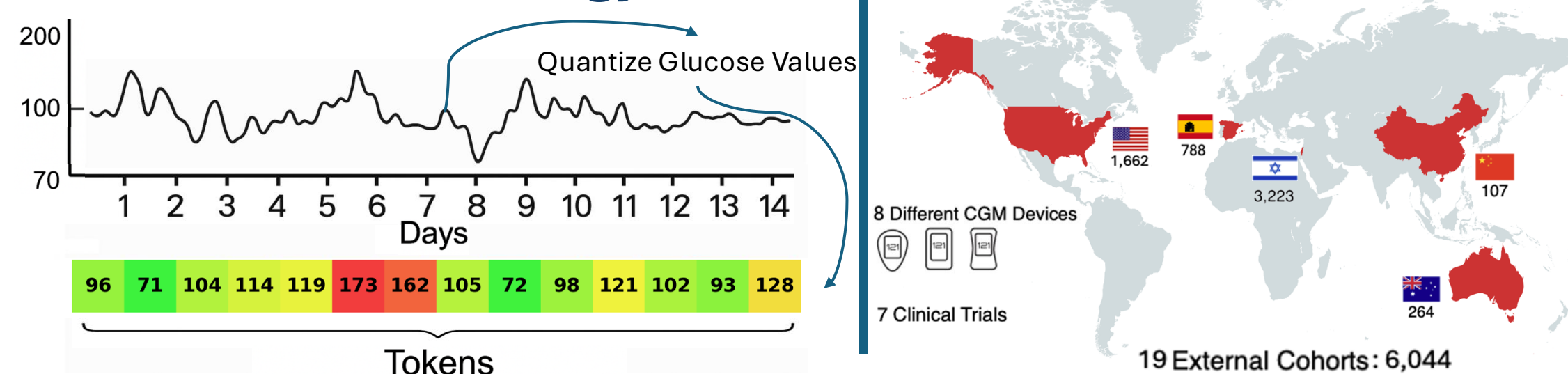
Use a cohort of ~10,000 individuals with continuous glucose monitoring (CGM) to build a generative transformer model using next token prediction.



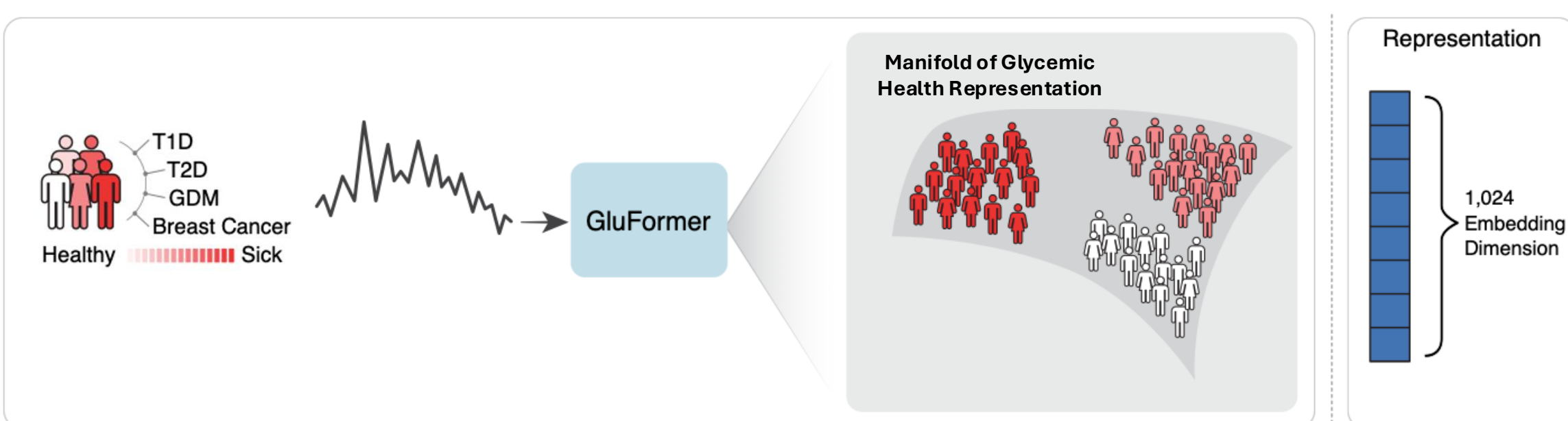
Downstream Tasks



2. Tokenization Strategy



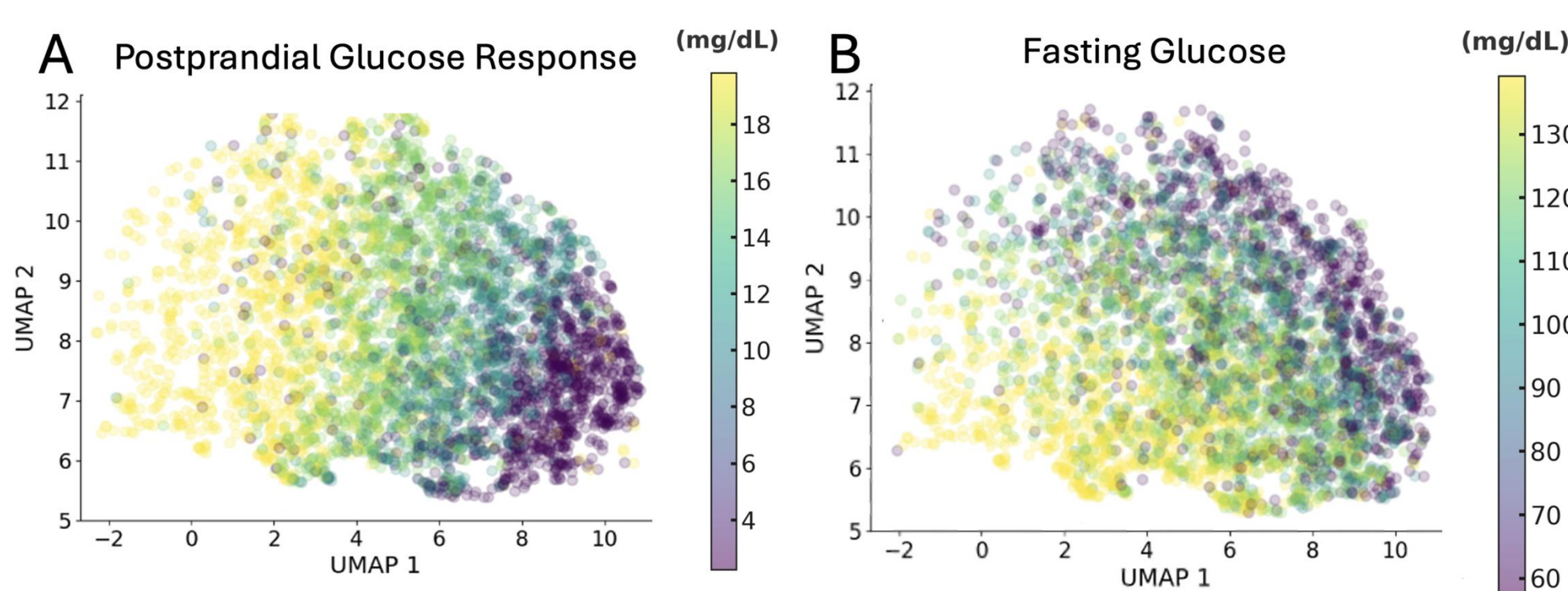
3. Creating Generalizable Representations: Validated on OOD Cohorts



GluFormer representations generalize across different axes:

- Diseases.
- CGM devices.
- Populations over the world.

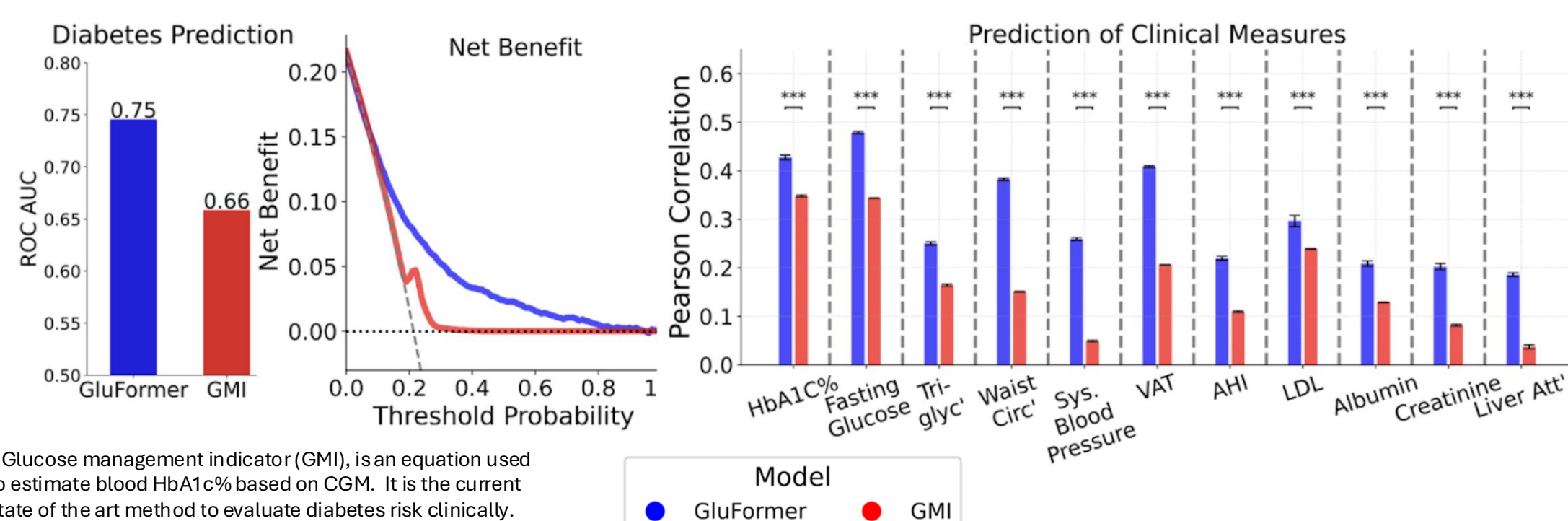
4. Representation Space Captures External Phenotypes



Coloring UMAP by features unknown to GluFormer:

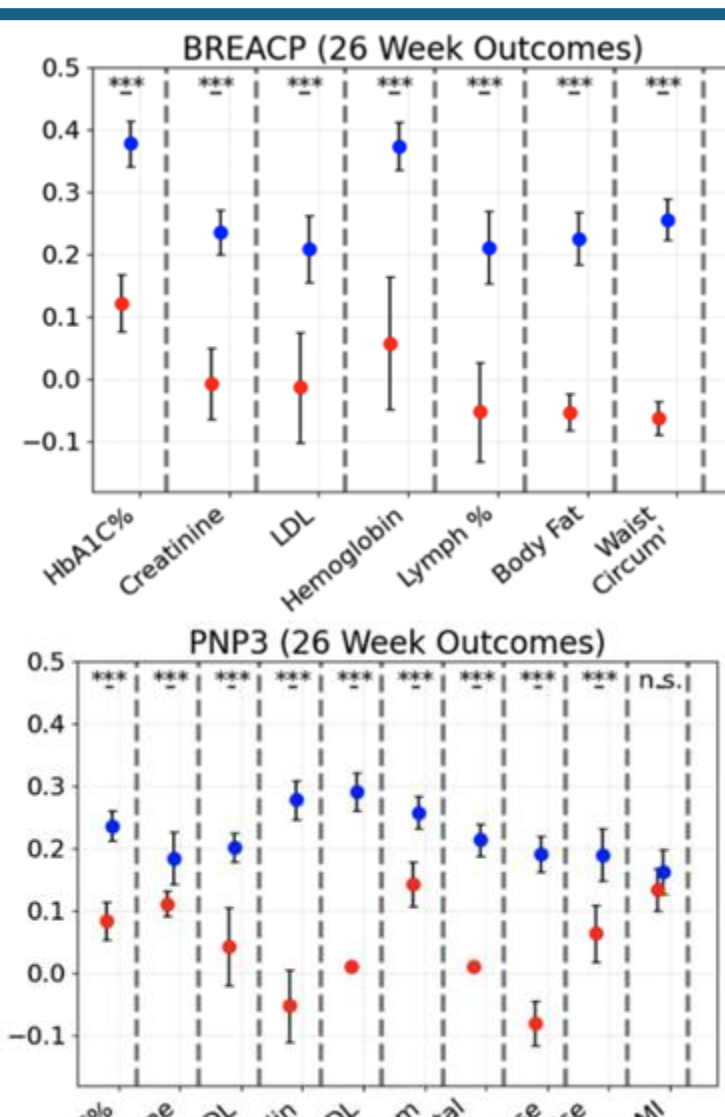
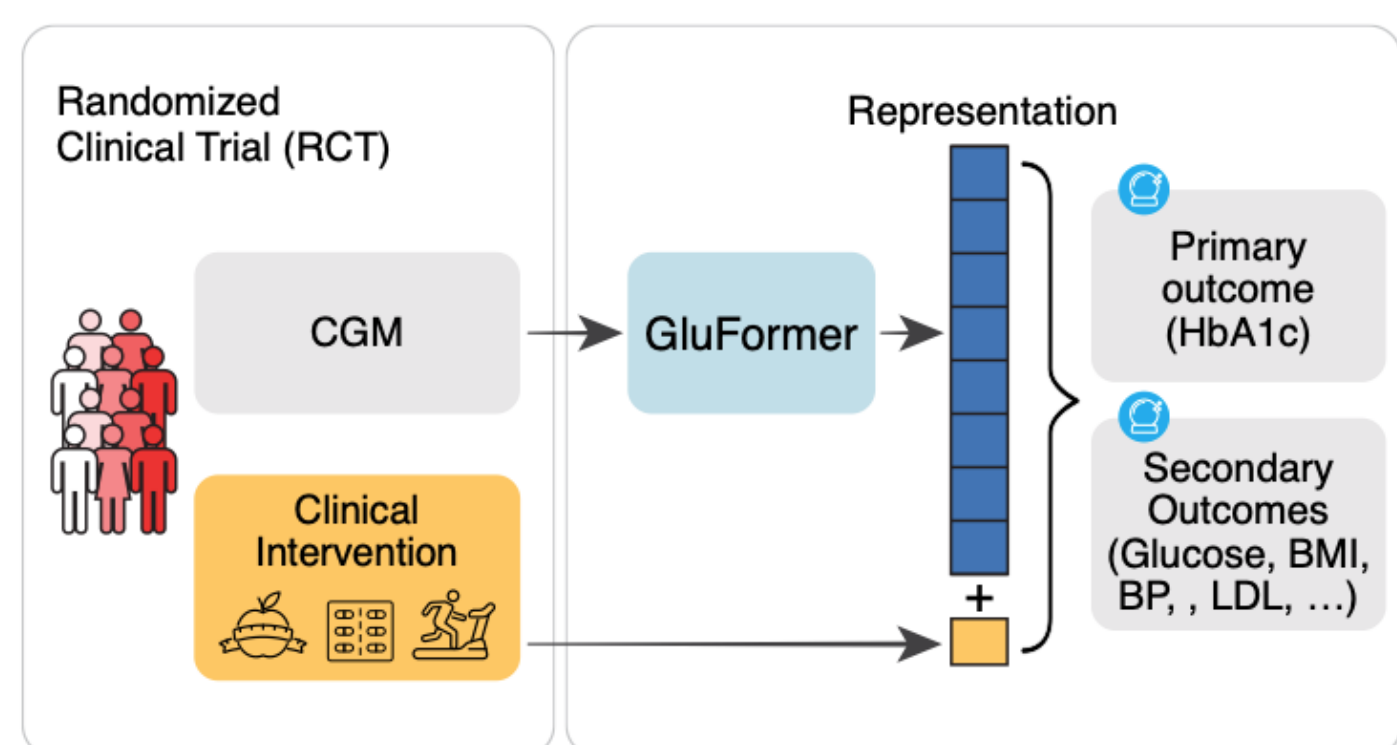
- Diet Response
- Blood Fasting Glucose

5. Representations are Predictive of General Health, and Outperform Gold-Standard CGM Summary Tool - GMI

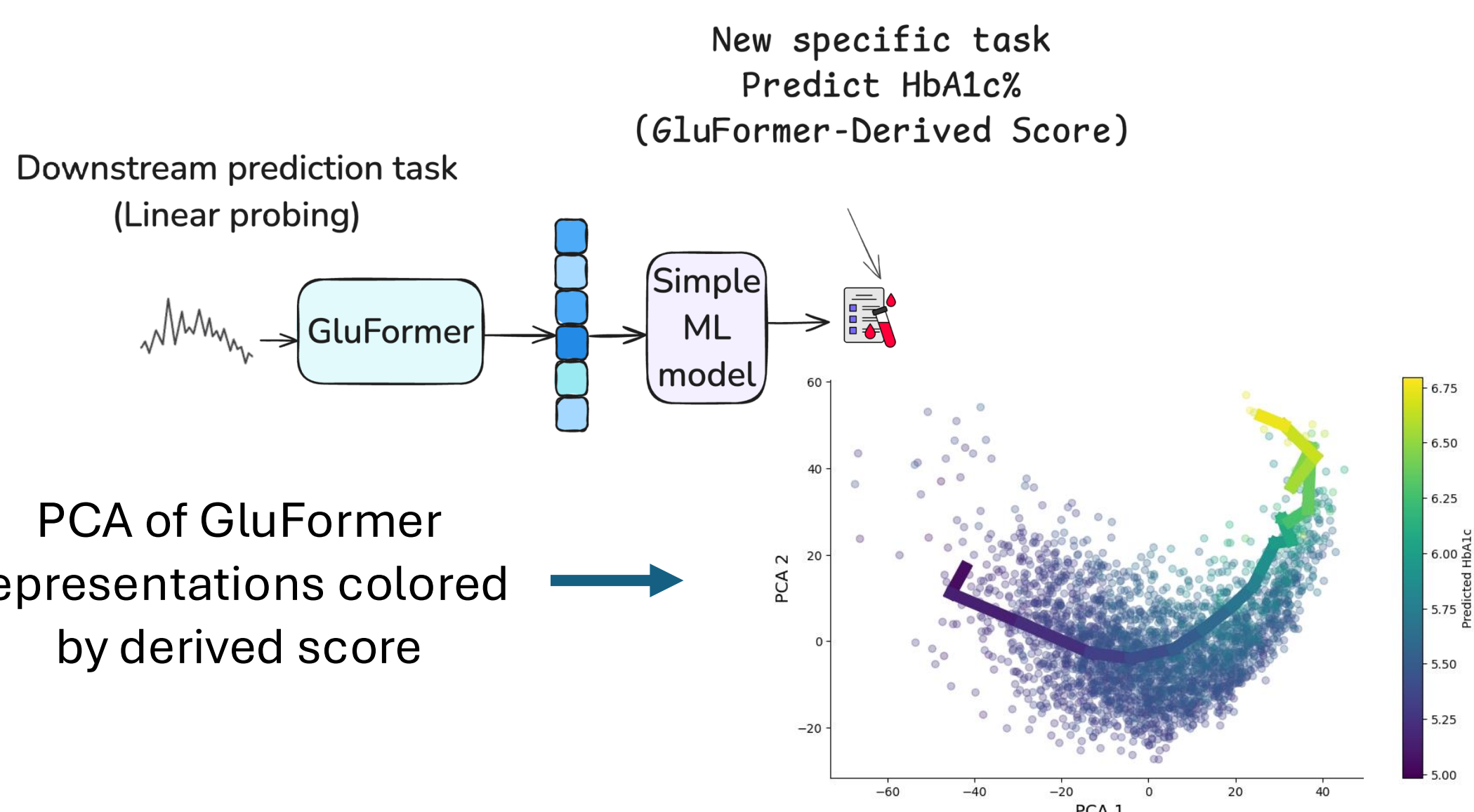


* Glucose management indicator (GMI), is an equation used to estimate blood HbA1c% based on CGM. It is the current state of the art method to evaluate diabetes risk clinically.

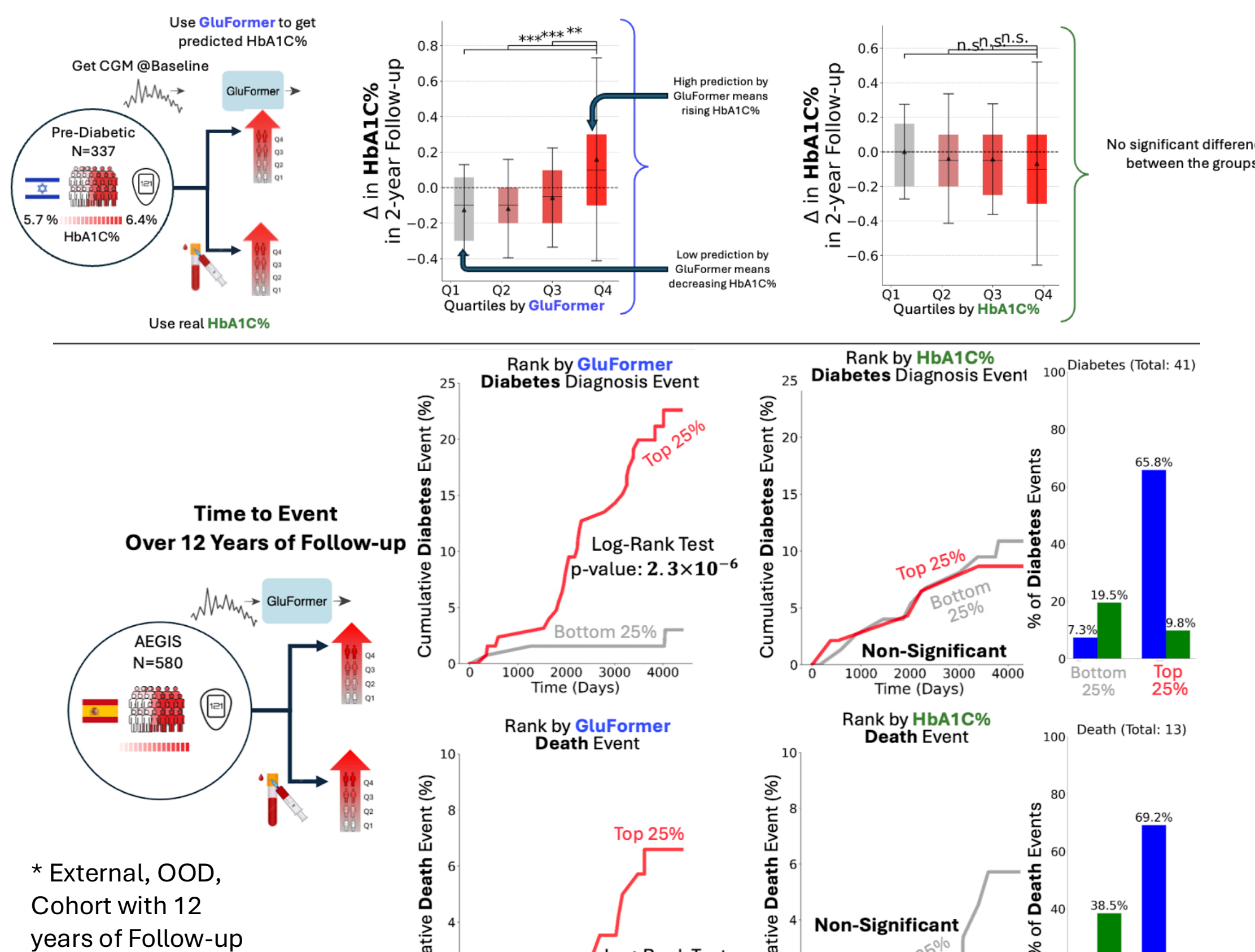
6. Representations are Predictive of Randomized Clinical Trial Results, and Outperform GMI



7. Predicted Hba1c% Acts as a Continuous 1-d Score to Rank Individuals on a Disease Progression Spectrum

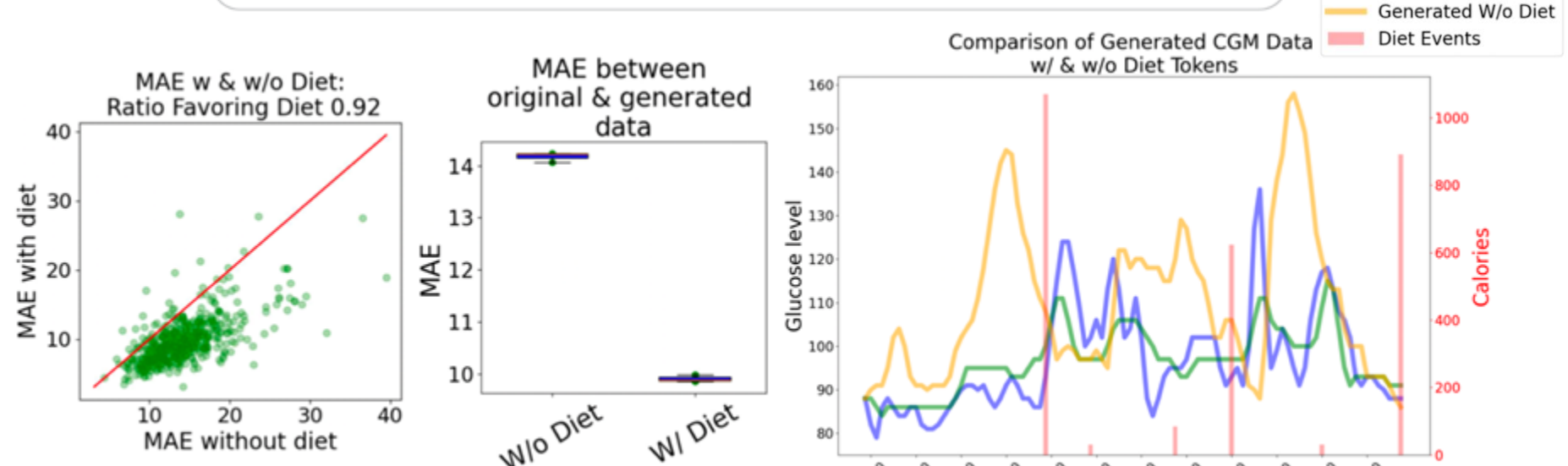
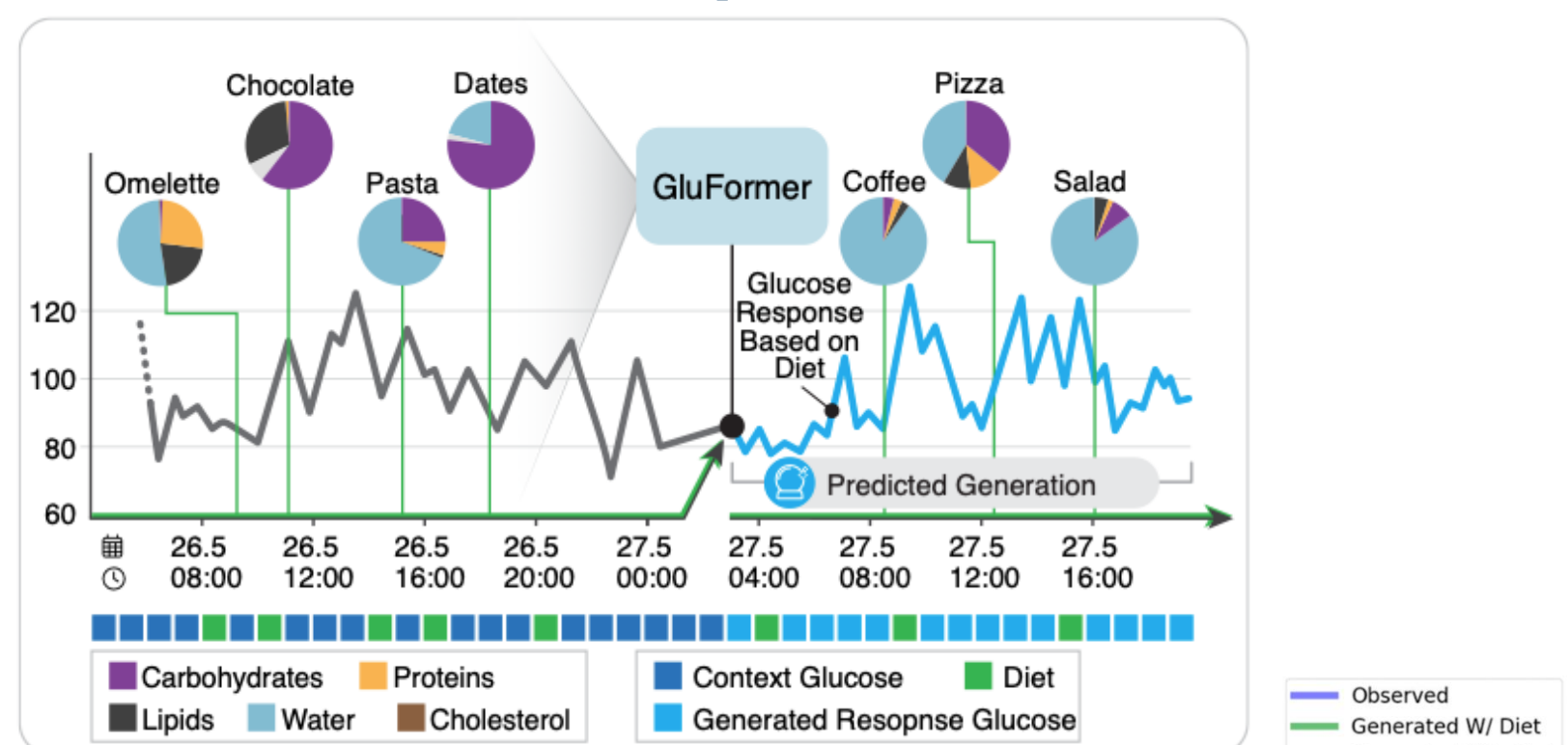


8. GluFormer-derived Score is More Predictive of Future Diabetes than Gold-Standard Blood Test for Diabetes



* External, OOD, Cohort with 12 years of Follow-up

9. Multi-Modal GluFormer: Adding Diet Loggings to Simulate Glucose Response to Food Intake



Scan Me for Full Paper!

From Glucose Patterns to Health Outcomes: A Generalizable Foundation Model for Continuous Glucose Monitor Data Analysis



Scan Me to See Poster & Git Code!