# Research Questions

## What are the 3 takeaways for this research?

- The study created unified representations of clinical codes, enhancing the accuracy, generalizability, and interpretability of AI predictions usable for multiple healthcare settings.
- Clinical embeddings are powerful representations of medical knowledge, closely matching real-world disease presentations, diagnostic guidelines, and the intricate relations between different clinical entities.
- Evaluations of their embeddings by domain experts from multiple healthcare institutions worldwide demonstrated that the embeddings are in face in excellent accordance with established clinical consensus, paving the way for standardized, reliable clinical AI applications.

## How could this research be important for Humana?

1. It can allow Humana to input its calibrated clinical embeddings into predictive models to generate more accurate and consistent recommendations for personalized care across a diversity of patient populations.
2. Transparent and interpretable embeddings can help Humana adhere to the ethics of well documented, bias aware AI solutions while at the same time maintaining a level of compliance with healthcare regulations.
3. The research would allow Humana to enhance its AI-based health risk assessments with clinically validated embeddings, resulting in greater patient outcomes, tailored interventions, and targeted precision medicine efforts at scale.
4. The research also assists Humana in normalizing clinical data representation, so information can flow freely between various healthcare services and organizations.

## How can you include this research into your Q/A chatbot?

We incorporated findings from the Unified Clinical Vocabulary Embeddings for Advancing Precision Medicine study by using precomputed 128D clinical concept embeddings (full_h_embed_hms.pkl) in our Q/A chatbot. These embeddings, derived from domain-specific medical text encoders, enable the chatbot to deliver

more accurate, biologically grounded responses, especially in oncology-related topics like gene amplification and cancer prognosis.