

PROJECT OVERVIEW: CRISPR Payload (EXP-003) Subject: Off-Target MLOps Predictor

Objective: To build an enterprise-grade, containerised MLOps pipeline that evaluates the safety of CRISPR-Cas9 single guide RNAs (sgRNAs) prior to in vivo editing.

Methodology: A TensorFlow-based deep learning model trained on genomic cleavage data to predict unintended off-target mutations. The model is wrapped in a FastAPI backend and fully Dockerised, ensuring reproducible, scalable predictions. Continuous Integration (CI) pipelines automatically test model drift when new genomic data is introduced.

Current Status: Deployment-ready. API endpoints are functional and returning probability scores.

Lab Notes: *Editing the code of life is easy; making sure you don't accidentally delete a vital function is the hard part. The algorithm's accuracy at predicting catastrophic cellular failure is comforting, yet terrifying.*