## Project title:

Development of a multimodal predictor of immuno-oncology response in endometrial cancer.

## Project Summary:


**Background**

- Immunotherapy benefits a subset of endometrial cancers (notably dMMR/MSI-H/POLE-mutant), but prediction of response remains imperfect.
- Genomic profiling is already available locally; integrating computational pathology and clinical data with genomics may markedly improve patient stratification.
- An explainable AI model could guide trial enrolment, reduce overtreatment, and shed light on mechanisms of resistance.

**Hypotheses**

- **H1:** A multimodal AI model (genomics + pathology images + clinicopathological features) will outperform single-modality predictors for best overall response.
- **H2:** Composite biomarkers (e.g., TMB + MSI/dMMR status + POLE/POLD1 + PD-L1 ) provide additive predictive value.

**Data**

- **Genomics:** TMB (RMH200), MSI/dMMR (RMH200), POLE/POLD1, copy-number burden.
- **Pathology:** Digitised H&E WSIs; optional IHC (MLH1/MSH2/MSH6/PMS2, PD-L1, CD8).
- **Clinical:** Standard clinical and outcome information.

**Gaps to fill**

- HRD score (depending on HRD project).
- RNA-seq or targeted immune panels

**Dependencies:**

- TMB/MSI are calculated based on RMH200 panel which requires validation.

**Expected outputs & impact**

- A validated, explainable multimodal predictor of immuno-oncology response in endometrial cancer, which can provide a model to expand to other tumour types
- New insights into biological drivers of response and resistance.
- Open-source code and a prototype clinical decision support tool to prioritise immuno-oncology and inform trial design.

**Supervisory Team: Angela George, Lina Yuan, Michael Hubank**

**Clinical Specialities: Oncology (Med Onc, Clin Onc or Surgical trainee), Pathology**