

# Detecting tumour-specific methylated markers from circulating free DNA using a mass sensitive low-cost platform

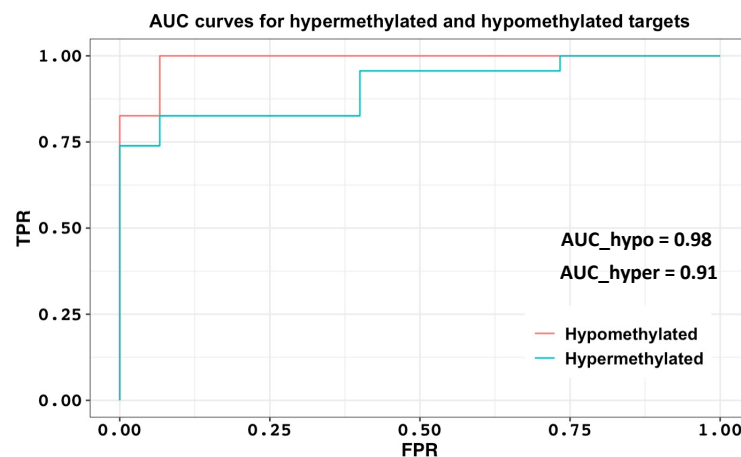
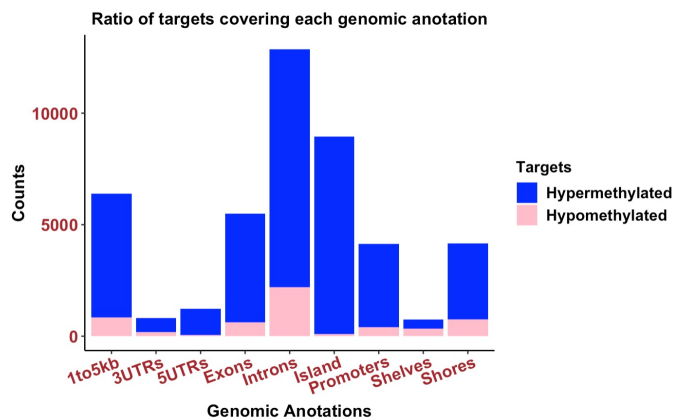
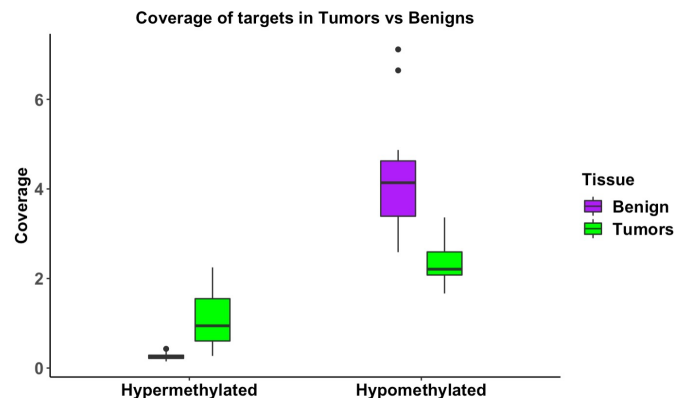
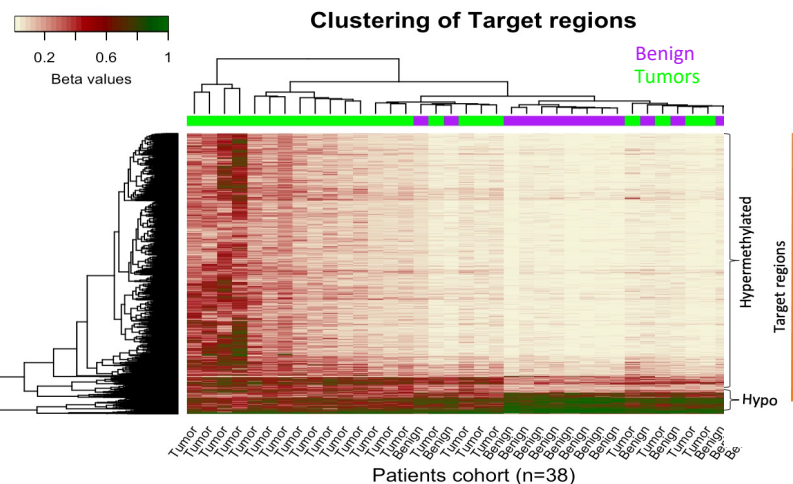
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## Project aim:

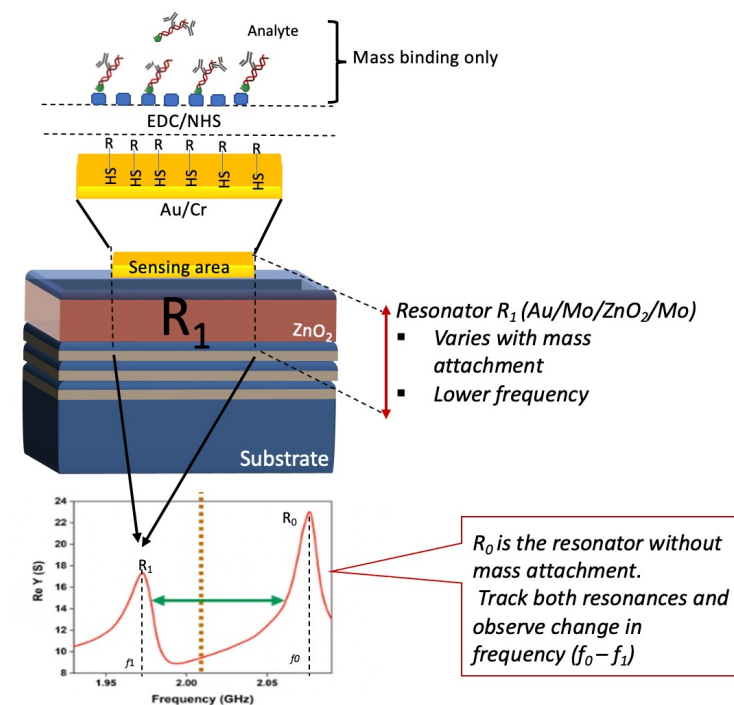
There is a need for an inexpensive, cancer-specific ultrasensitive blood-based test to support effective cancer diagnosis. Here I show the identification of prostate cancer-specific methylated targets using methylation binding domain pull down (MBD2\_seq) and the principle of detection from a pool of cfDNA using a mass sensitive low-cost Thin Film Bulk Acoustic Resonator (TFBAR).

## CtDNA methylated target panel discovery



## Mass sensing principle

TFBAR is a resonating device that operates at high frequency. When an analyte is deposited on the surface the mass change results in a frequency shift, as measure by the impedance.



## Future work:

The differently methylated targets will be validated in TFBAR and further assessed using a cohort of clinical samples ranging from healthy controls, early-stage cancers to high burden metastatic patients.

**Results:** Differential analysis from MBD2\_seq at an FDR <0.05 indicates two sets of targets: Hypermethylated and Hypomethylated, with majority being hypermethylated and populating most of the genomic regions at lower coverage. In contrast, hypomethylated show higher coverage and an exceptional 0.98 performance in AUC curve.