

Precision Medicine at KI Biobank

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Abstract

KI Biobank at Karolinska Institutet is a research-integrated biobank uniquely capable of tailoring the processing of human samples to meet various research requirements. By adopting flexibility and adaptability in automation and data management, we offer processing of a wide range of samples and tube types, currently handling 80 sample types (e.g. plasma, saliva, viable cells) and 70 different tube types.

In close collaboration with researchers, KI Biobank has during the past few years developed a pipeline suitable for collection of samples in precision cancer medicine (PCM) initiatives. Our PCM-services includes amongst others cfDNA/gDNA/tDNA extraction with quick sample delivery, vital for real-time tumour profiling and treatment optimization. We prepare samples in desired format in agreement with analysis platforms and order sample transport. KI Biobank has supported successful PCM-projects such as ProBio* clinical trial on prostate cancer and ALASCCA** clinical trial on colon cancer (De Laere et al., *Nature Medicine* 2024 and Martling et al., *N Engl J Med* 2025).

Over the past 20 years, KI Biobank has grown and evolved and today hosts over 10 million samples from nearly 800 000 consenting donors, participating in 230 active research studies with nearly 1 million samples withdrawn for scientific analyses.

What makes KI Biobank Strong and Unique?

- ❖ High Research & Customer Focus
- ❖ Solution Oriented
- ❖ Strong IT Focus
- ❖ Services available to customers outside KI



Figure 1. KI Biobank is a high-tech infrastructure for pre-analytical handling, storage and distribution of human biological samples.

Study & Sample services

- Ethics & regulatory advice
- Referrals
- Sample preparation
- Storage
- Aliquoting & Reformatting
- Preparation of viable cells
- DNA extraction (gDNA & cfDNA & tDNA)

IT services

- LIMS
- Data withdrawal (LifeGene, EpiHealth)
- Participant data (CRM)
- Data visualisation & access

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For more information, please scan QR code:



Precision Cancer Medicine (PCM)



Figure 2. PM Studies – Sample handling at KI Biobank.

Example of Study Design

1. Clinic: Cancer Diagnosis

2. Consent & Sampling: Blood and tissue.

3. Transport

4. Sample Reception & Preparation at KI Biobank:

- FFPE for extraction of tissue DNA.
- Whole blood EDTA-tubes for extraction of genomic DNA.
- Whole blood EDTA/Streck-tubes for preparation of cfPlasma.
- cfPlasma for extraction of cfDNA.

5. High-throughput DNA-extraction and sample delivery at KI Biobank

6. Library preparation & Sequencing: at e.g. SciLifeLab in Sweden.

7. Data Analysis: Sequencing data is analyzed by the research team.

8. Clinic – Tailored Treatment: Based on DNA sequencing results.

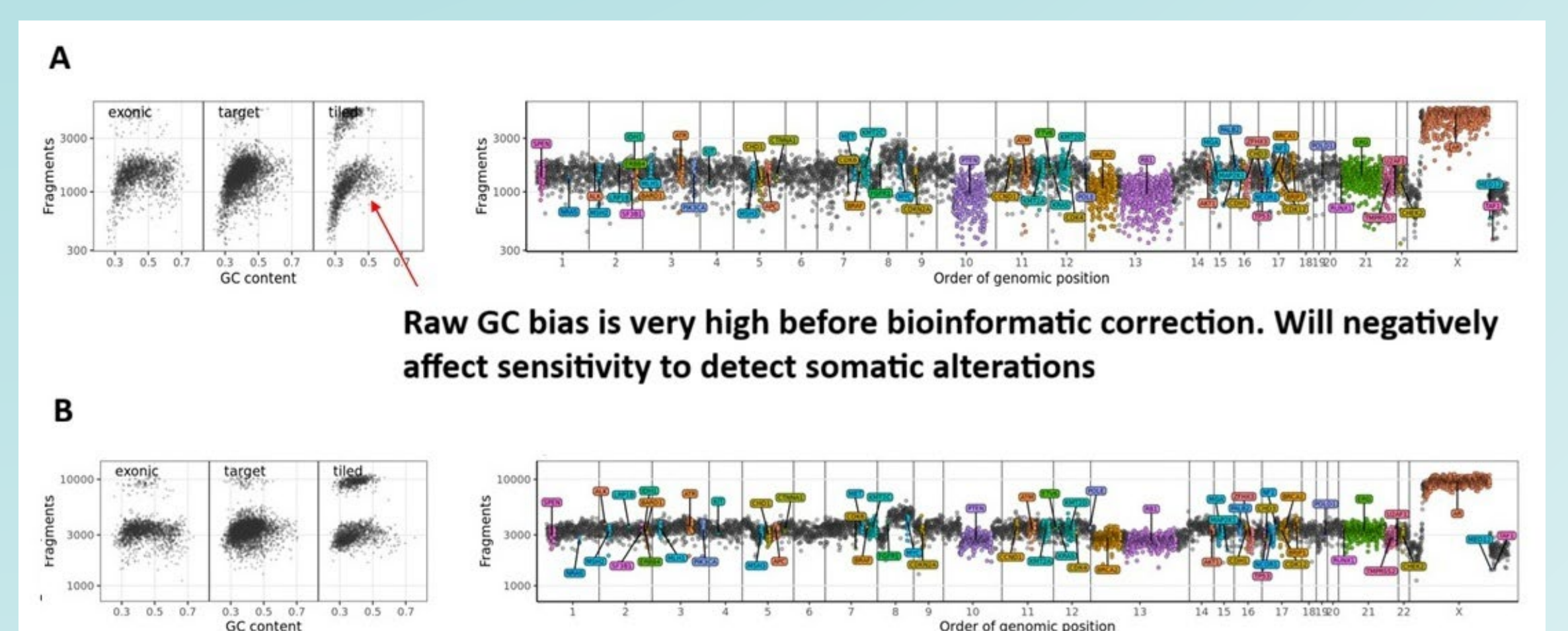


Figure 3. *The ProBio trial is an international, multi-centre, outcome-adaptive, multi-arm, multiple assignment, randomised controlled, biomarker-driven, platform trial in men with metastatic prostate cancer. De Laere et al., *Nature Medicine*. 2024 Aug 20. A. cfDNA extraction using conventional kit B. cfDNA extraction by KI Biobank using chemagic™ Prime cfDNA Blood 3-5K on Revvity ChemagicPrime 8.

**The ALASCCA study. Daily treatment with low dose aspirin (160 mg) reduces the risk of recurrence by 50% in patients with colorectal cancer who have a specific genetic change in PI3K. KI Biobank contributed with extraction of gDNA and tissue DNA. Martling et al., *N Engl J Med* 2025



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