

## PROPOSITIONS

Accompanying the thesis **Mitochondrial DNA as a Breast Cancer Biomarker**

1. Low primary tumour mtDNA content is associated with worse prognosis in early-stage breast cancer patients, but is also associated with better outcome from anthracycline-containing chemotherapy in both early-stage and advanced breast cancer patients. (*This thesis*)
2. The exact biological and clinical significance of the minor differences in mitochondrial expression between breast cancer ER-subtypes warrants further study. (*This thesis*)
3. Large heterogeneity in somatic mitochondrial DNA mutations is present among and within primary breast cancer tumours. (*This thesis*)
4. There is limited value in tracing tumour-specific mtDNA variants as blood-circulating cfDNA. (*This thesis*)
5. “Distinguishing between truly tumour-specific somatic [mtDNA] mutations and those already present in normal cells is not straightforward, nor is the distinction between germline and somatically-acquired variants in the normal cell.” (*S. Grandhi et al, Human Molecular Genetics 2017 and supported by this thesis*)
6. With the falling costs and higher throughput of next- and third-generation sequencing technologies, tumour-specific cfDNA profiling for both small molecular and large chromosomal somatic alterations is becoming more feasible in a clinical setting.
7. Personalized medicine in the field of oncology should not only stratify patients based on the somatic genetic aberrations present in cancer cells, but also take into account the germinal genetic individuality of the patient.
8. Mitochondrial DNA damage induced in non-cancer cells by cancer treatment might underlie poorly understood adverse treatment effects, such as cancer-related fatigue.
9. “[...] the injury to respiration must not be so great that the cells are killed, for then no cancer cells could result.” (*Otto Warburg, On the origin of cancer cells, Science 1956*)
10. “[...] cancer co-opts the logic of both evolution and heredity: it is a pathological convergence of Mendel and Darwin.” (*Siddhartha Mukherjee, The Gene: An Intimate History 2016*)
11. One scientist’s genomic trash is another scientist’s genomic treasure.