



The Human Biofluid RNA Atlas

EVA HULSTAERT, MD

AACR – Advances in Liquid Biopsies

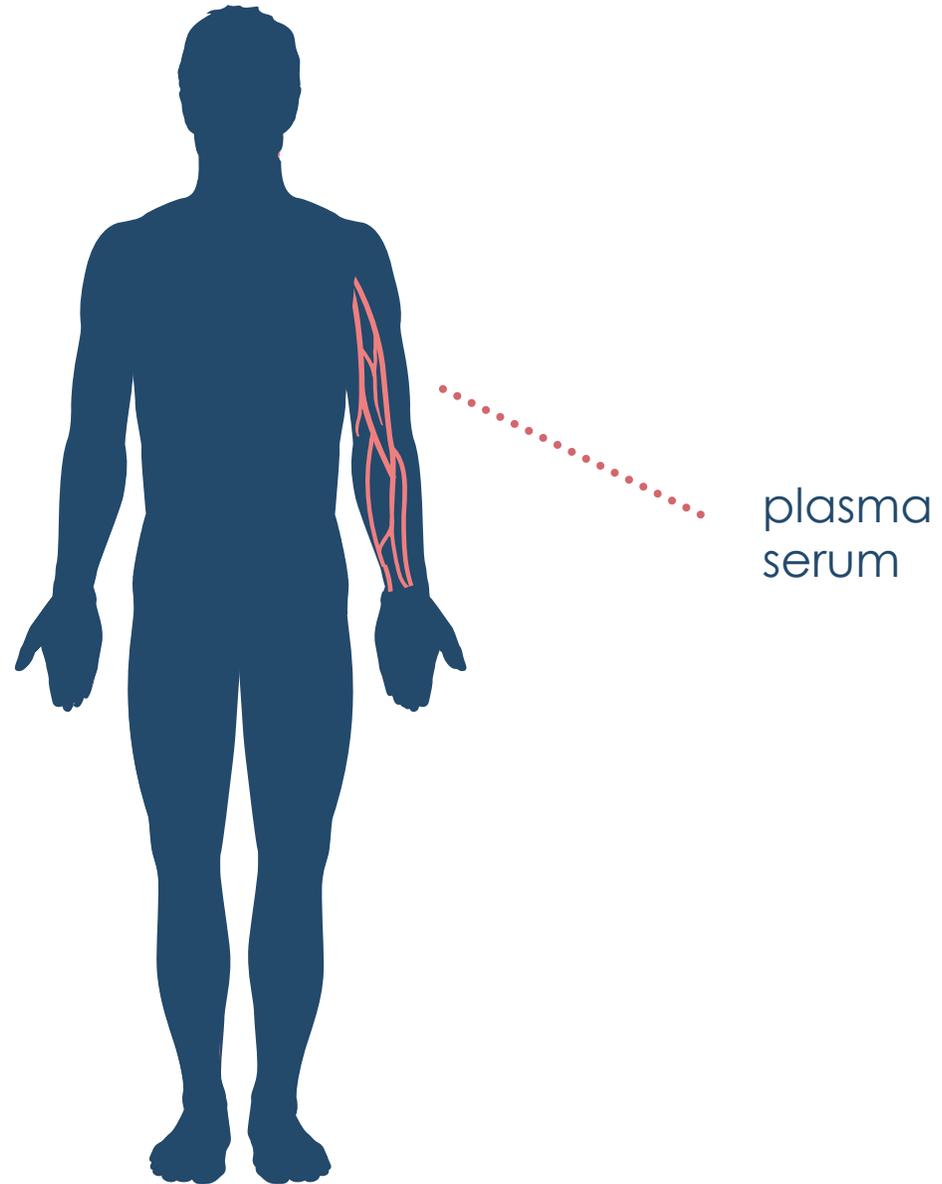
January 13-16, 2020

Miami, Florida

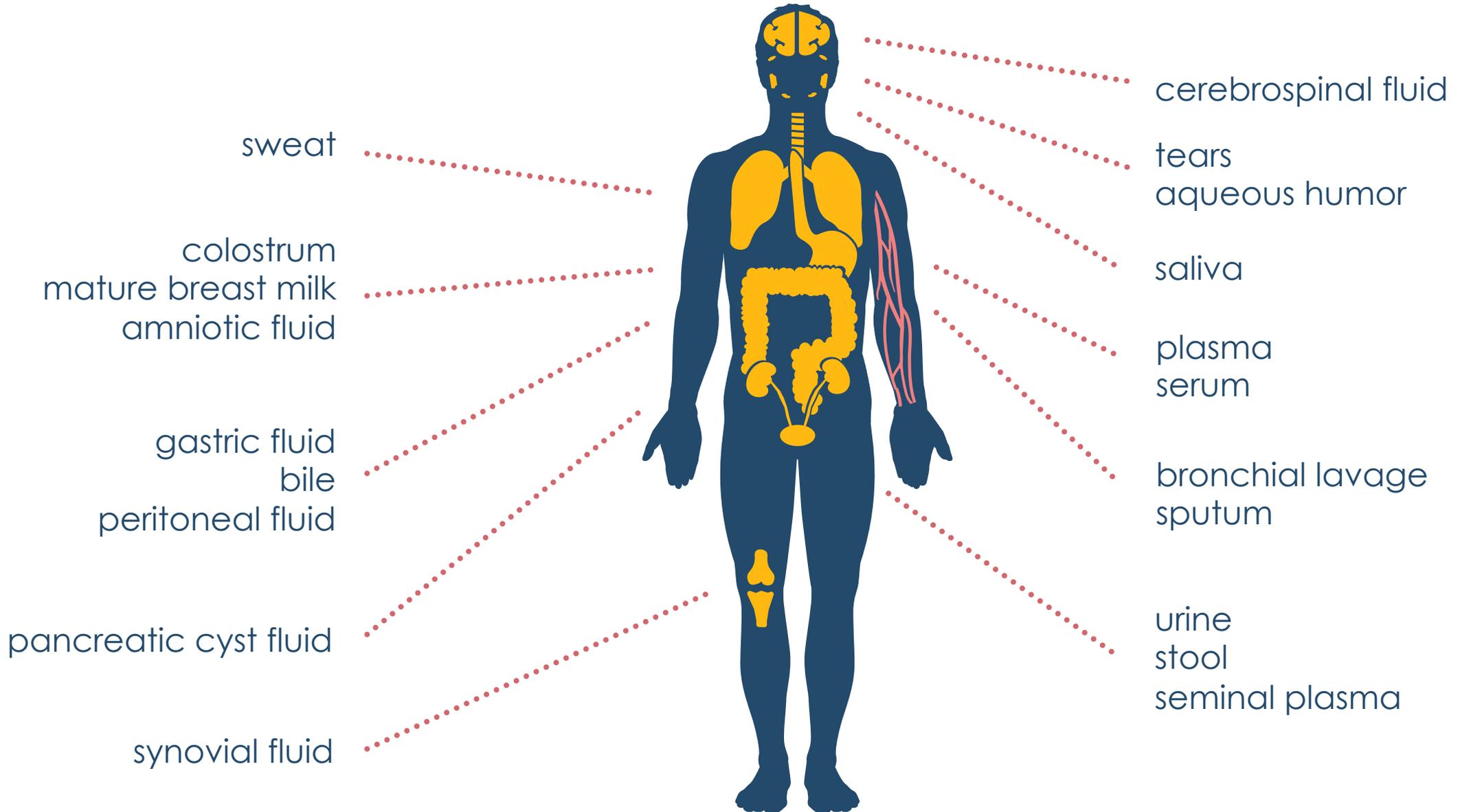


no conflicts of interest to declare

expanding the liquid biopsy field beyond the blood stream



expanding the liquid biopsy field beyond the blood stream



RNA sequencing allows detailed analysis of the transcriptome

small RNA seq

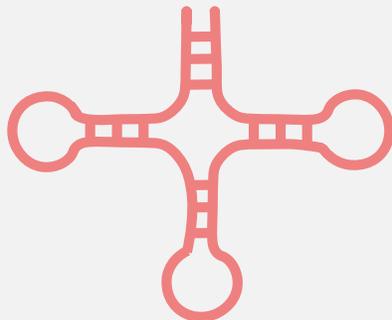
miRNAs



piRNAs



tRNAs

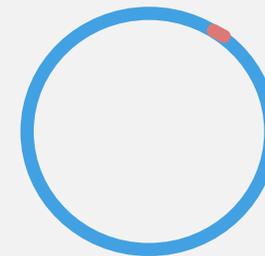


mRNA capture seq

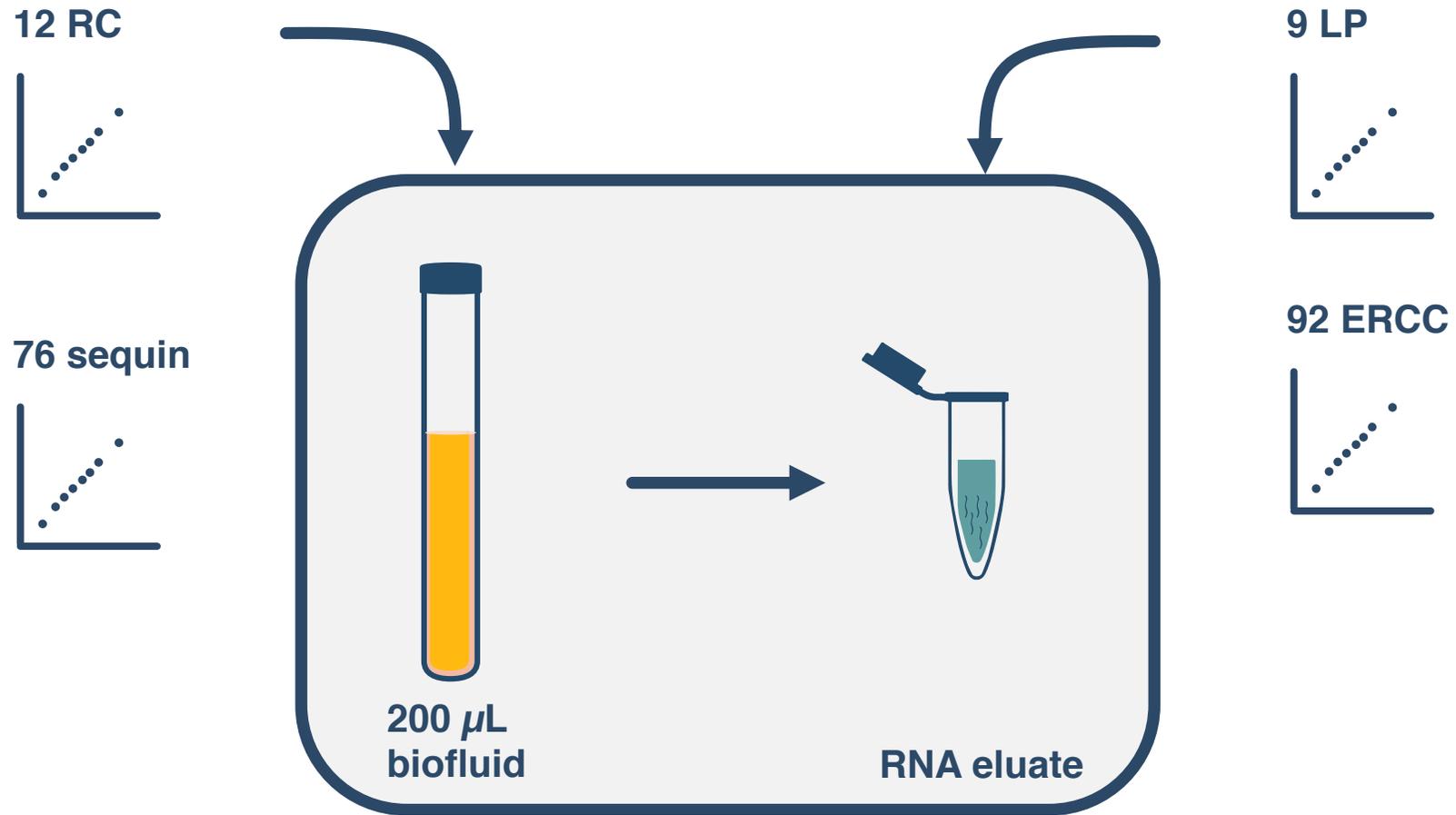
mRNAs



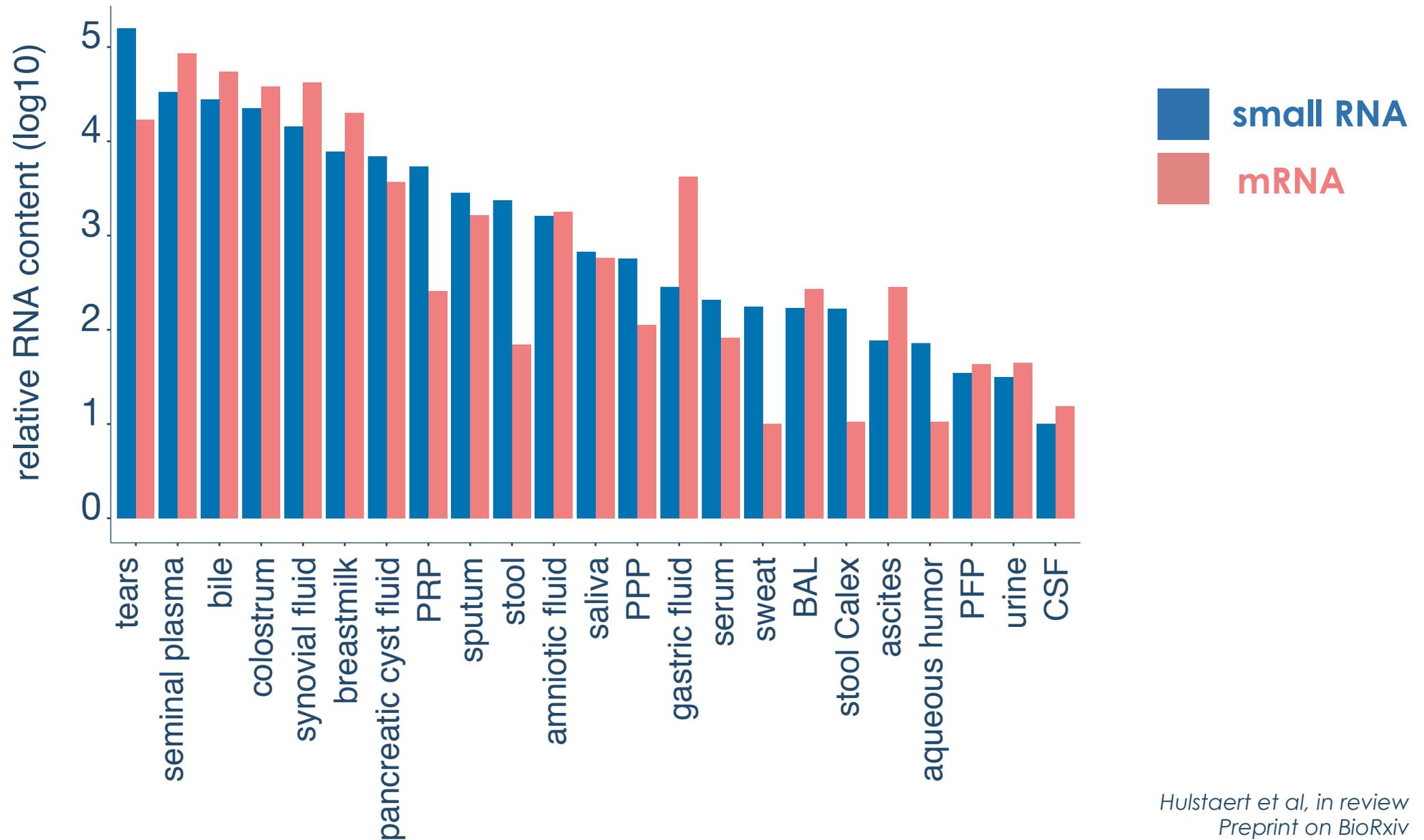
circRNAs



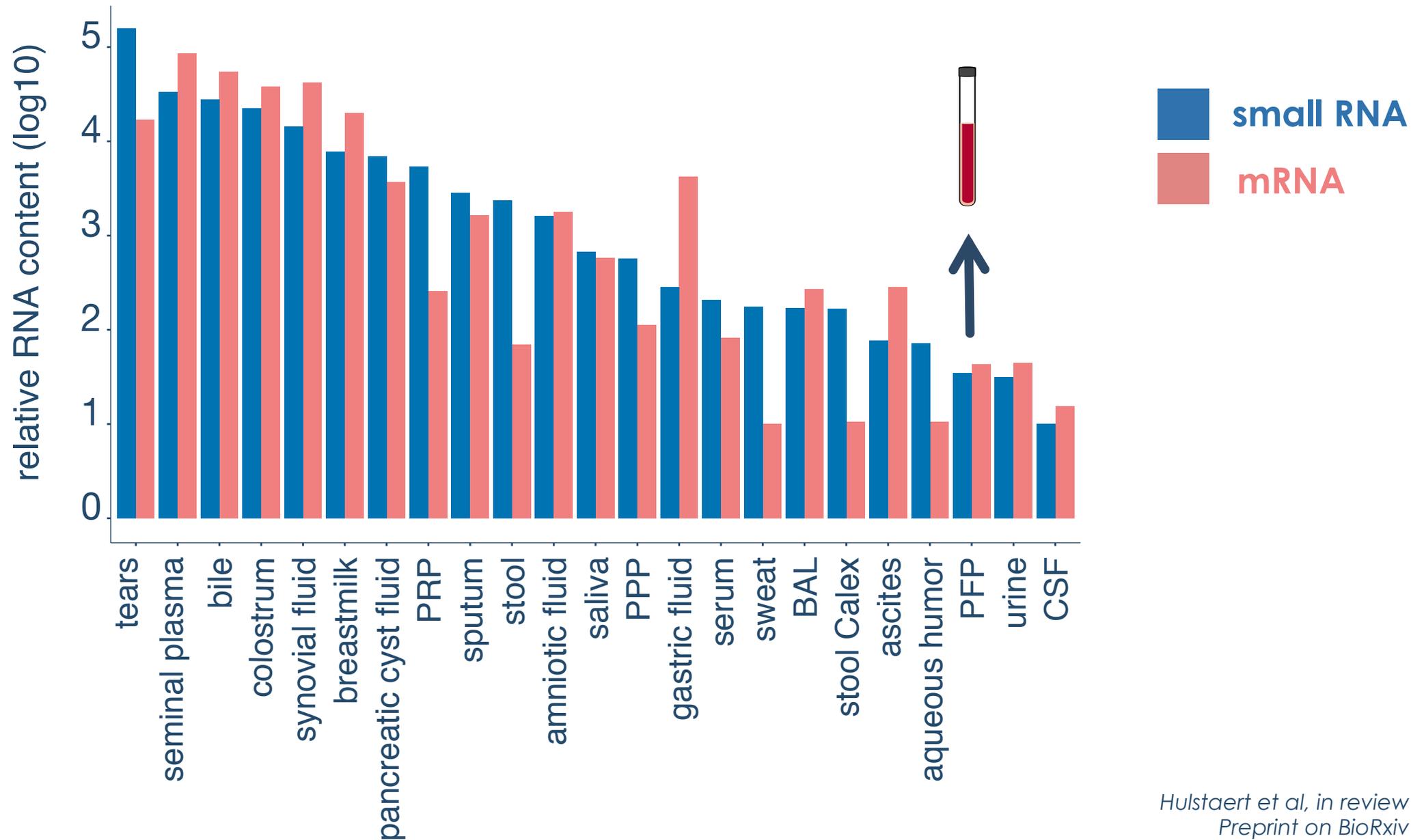
spike-in RNAs as processing controls and normalization tool



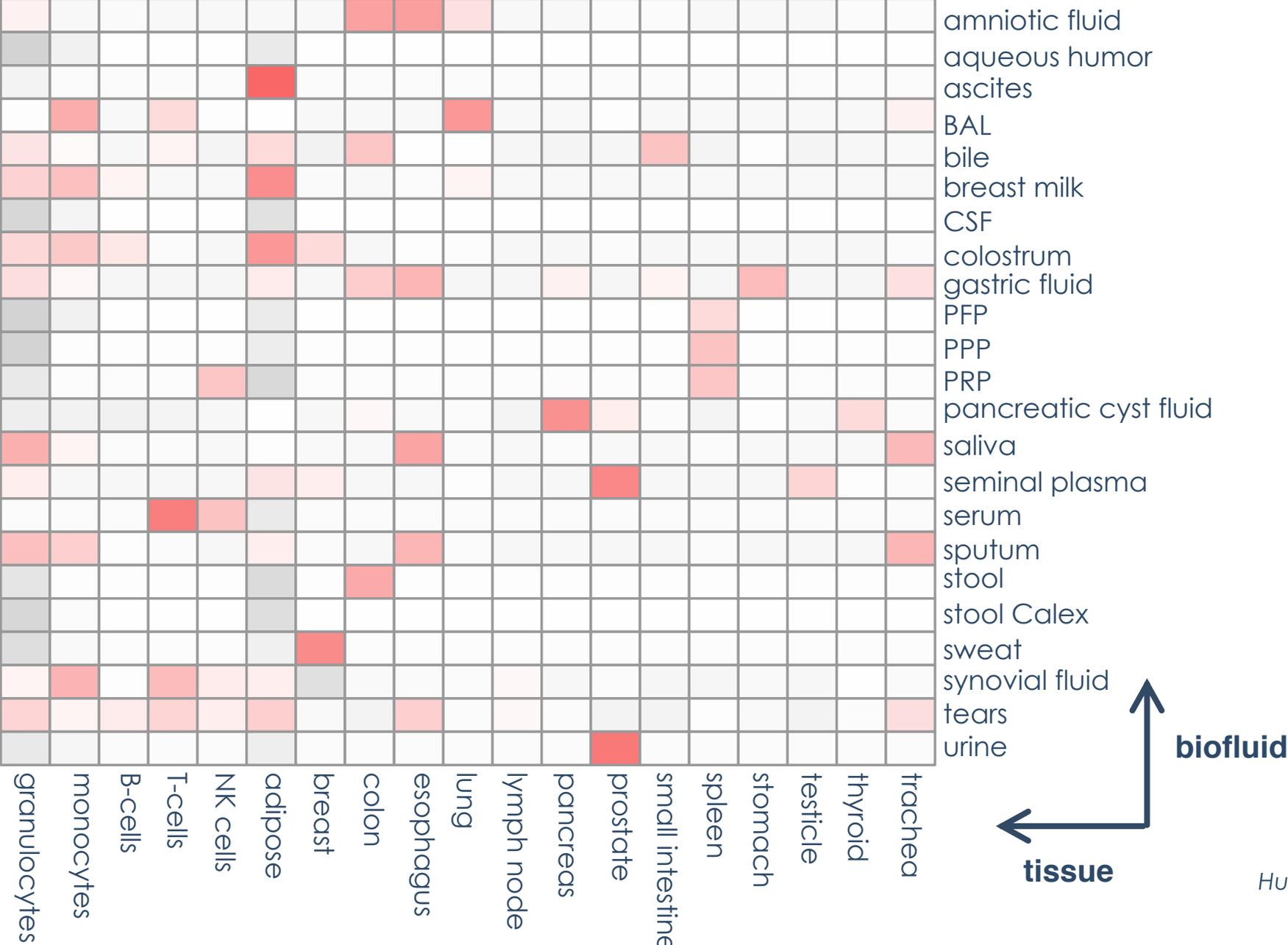
highly variable RNA concentrations amongst different biofluids



highly variable RNA concentrations amongst different biofluids

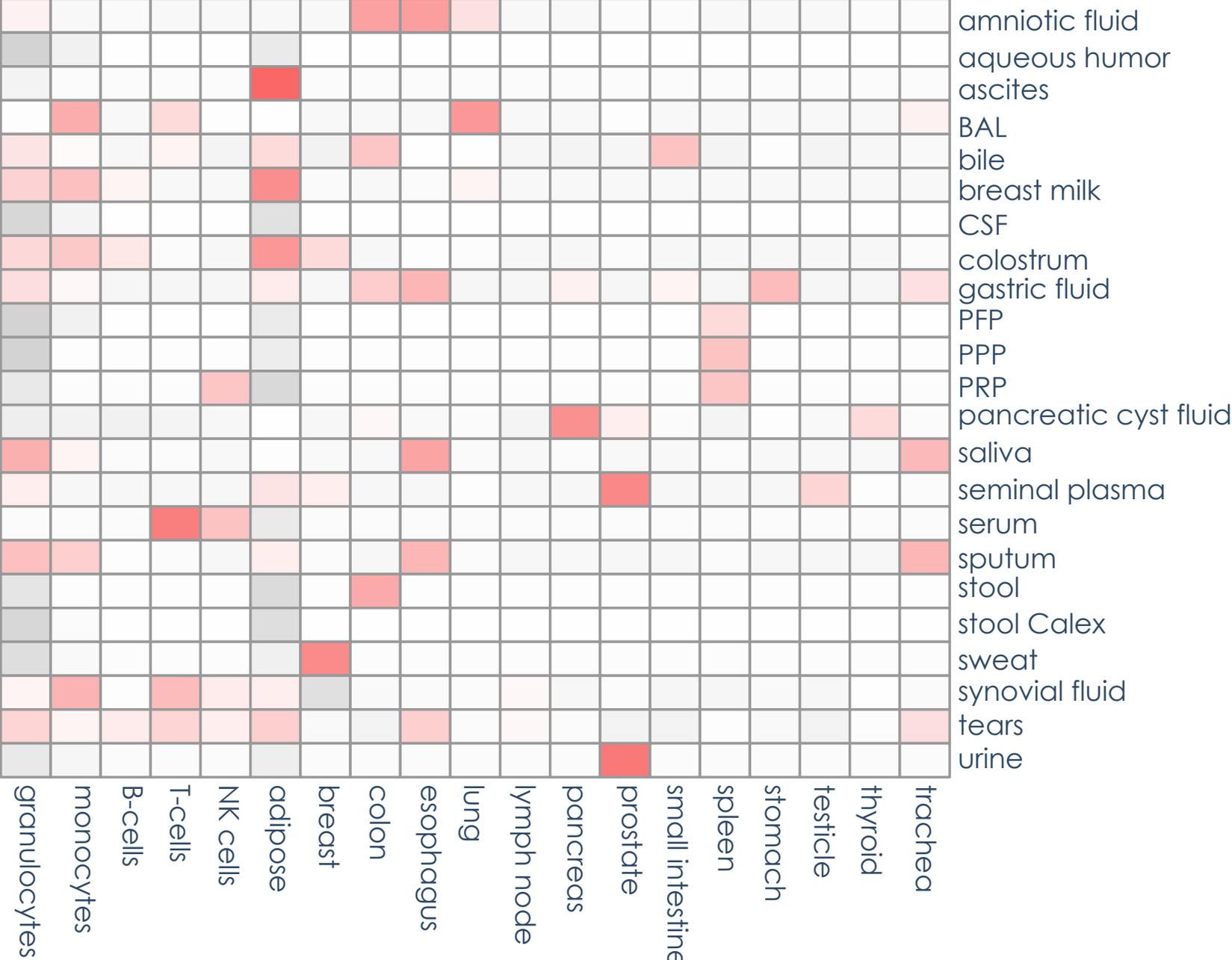


assessment of the tissues of origin in the different biofluids

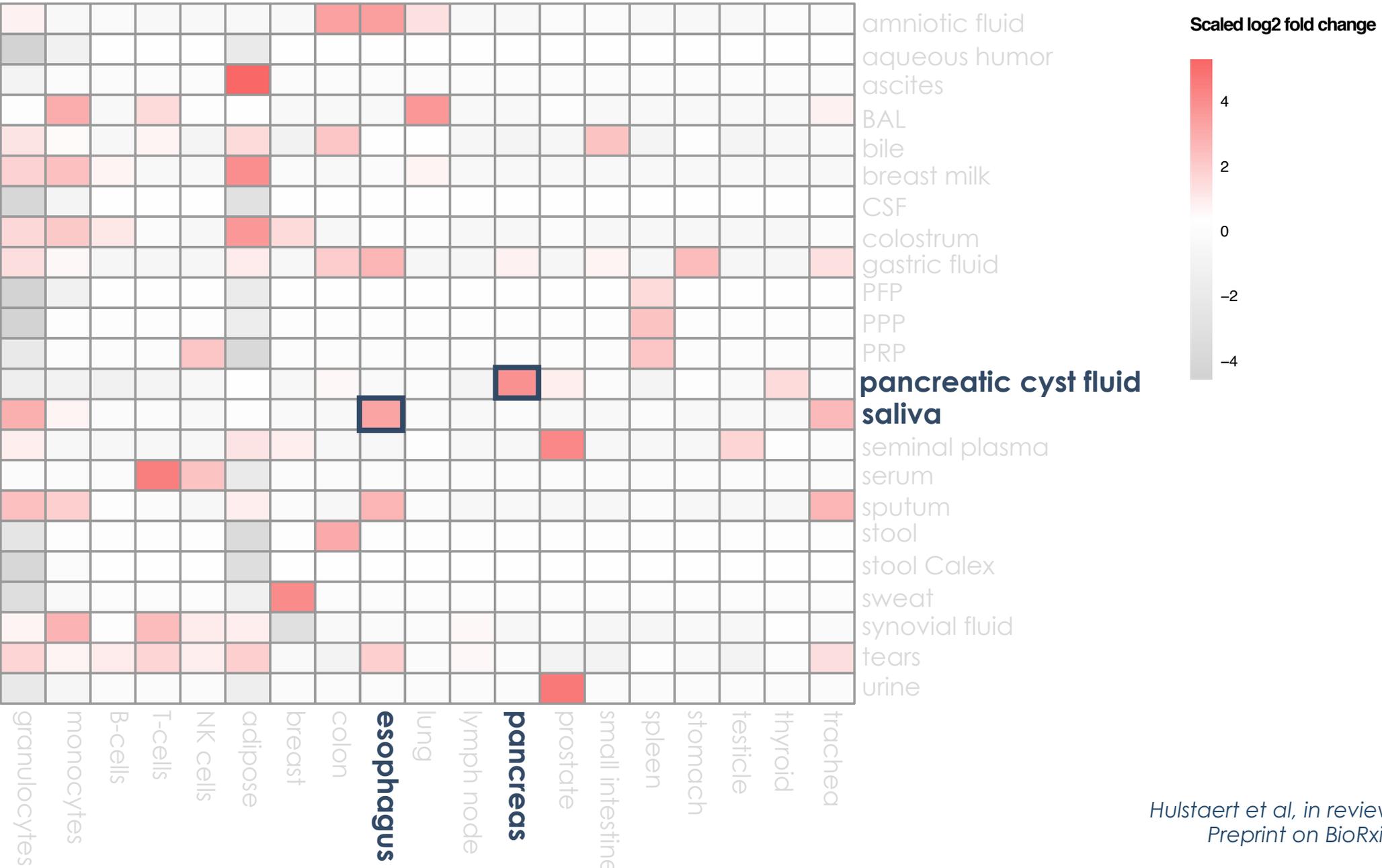


Hulstaert et al, in review
Preprint on BioRxiv

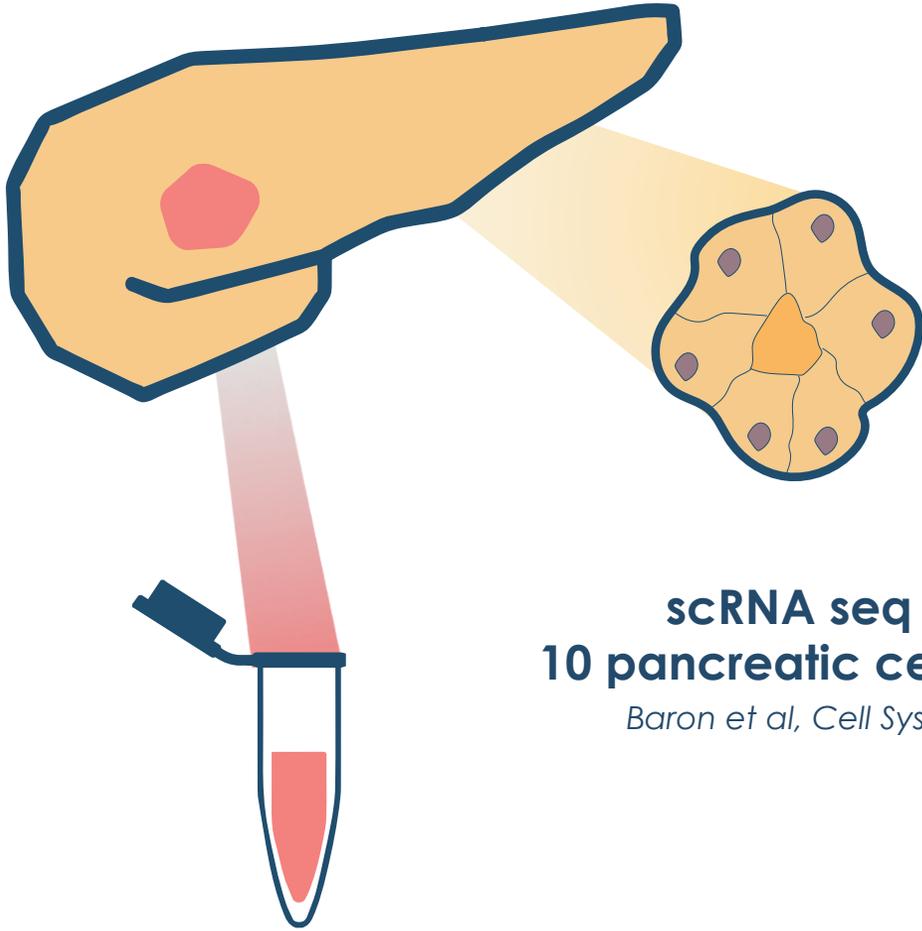
assessment of the tissues of origin in the different biofluids



assessment of the tissues of origin in the different biofluids



different cell types contribute to the RNA content of pancreatic cyst fluid

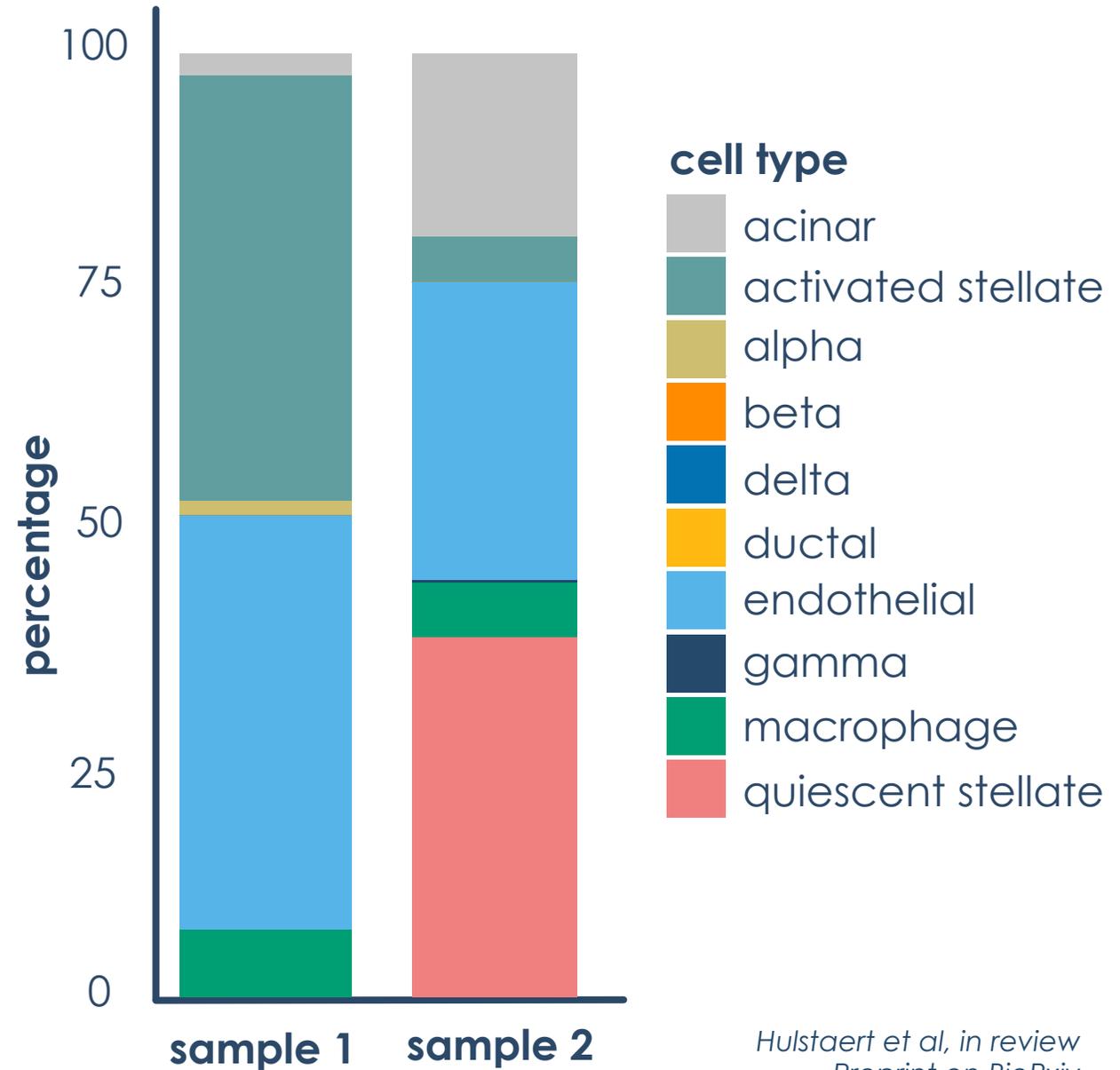
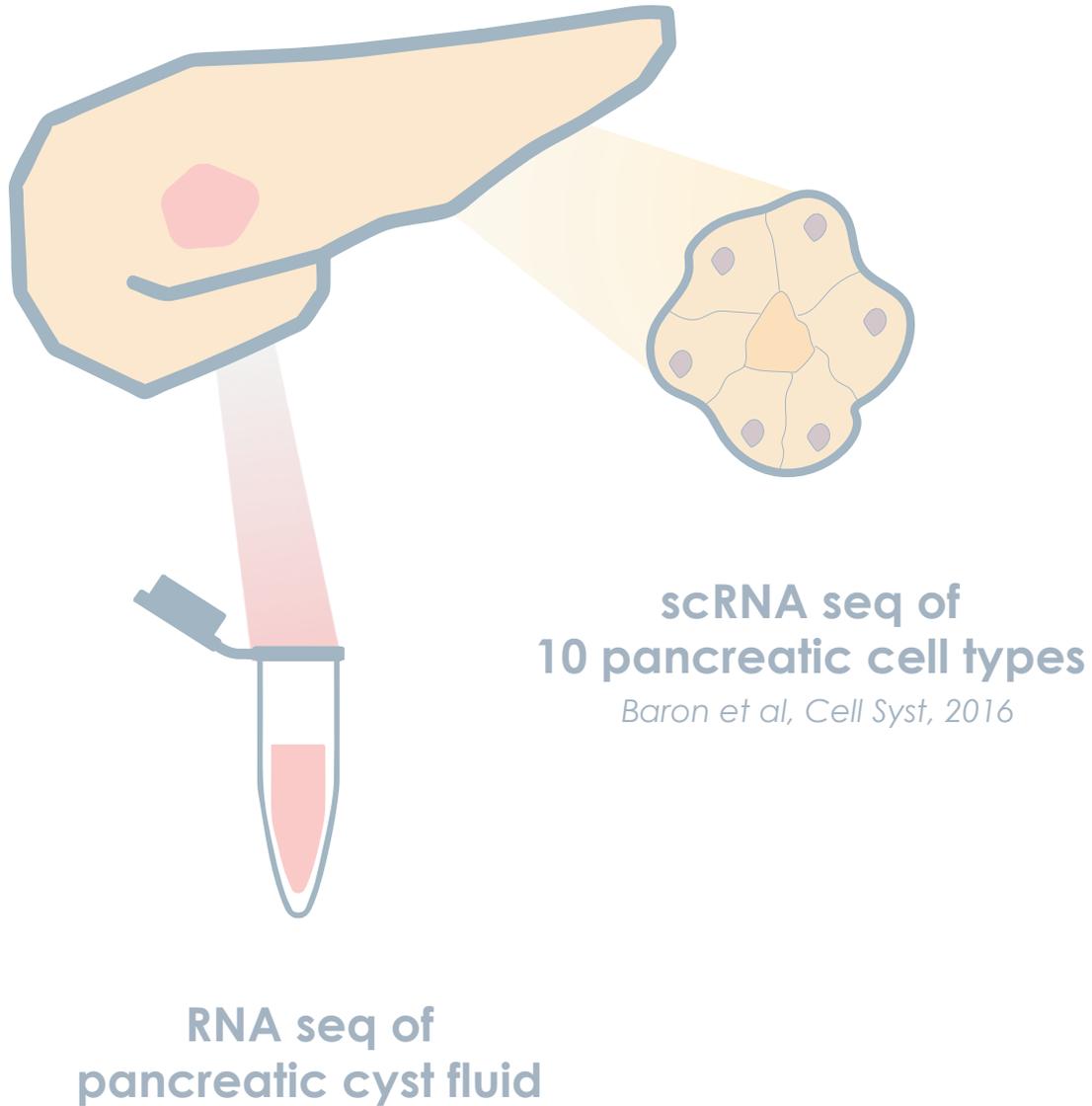


**scRNA seq of
10 pancreatic cell types**

Baron et al, Cell Syst, 2016

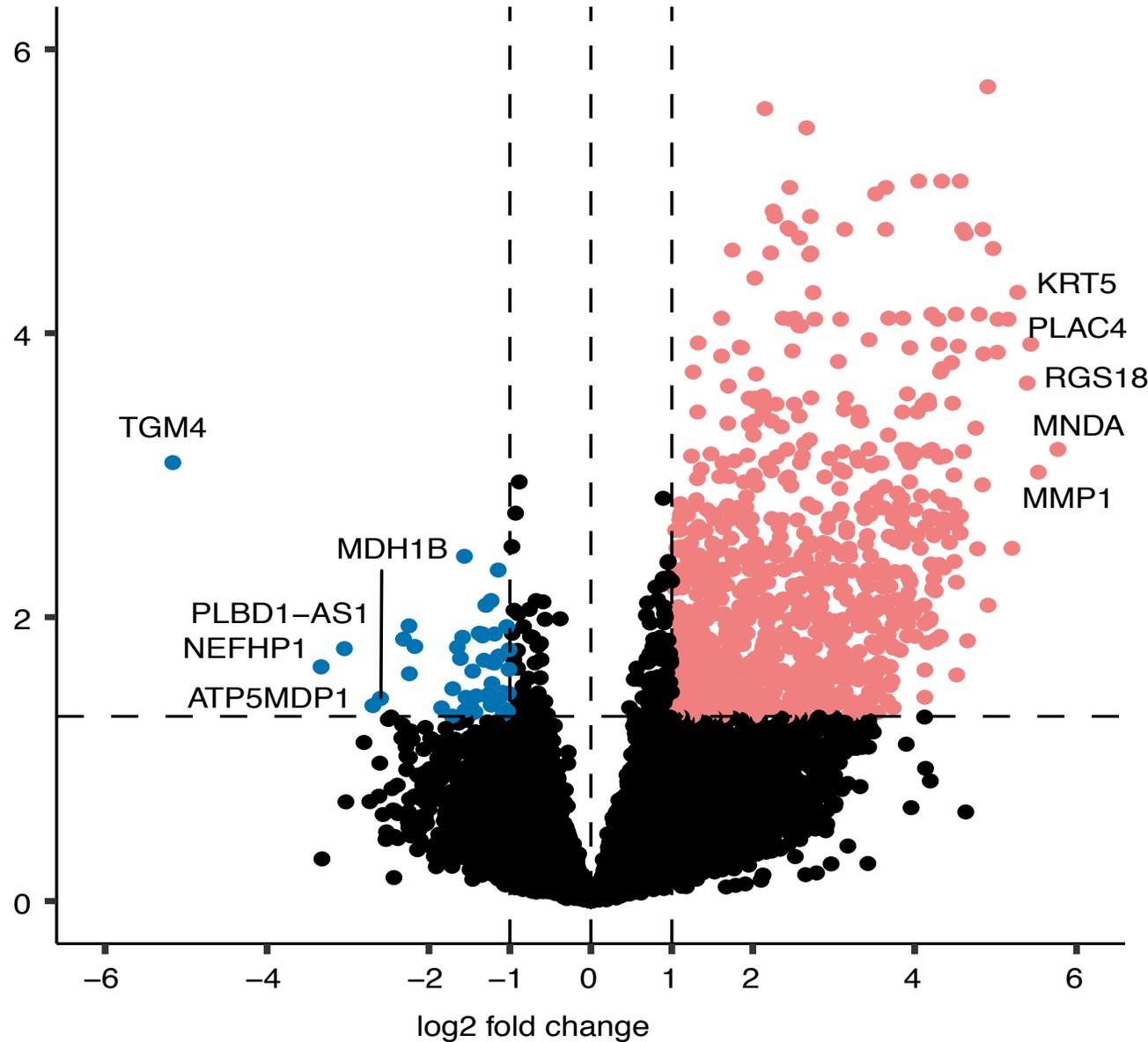
**RNA seq of
pancreatic cyst fluid**

different cell types contribute to the RNA content of pancreatic cyst fluid



differentially expressed mRNAs in urine of bladder cancer patients vs healthy controls

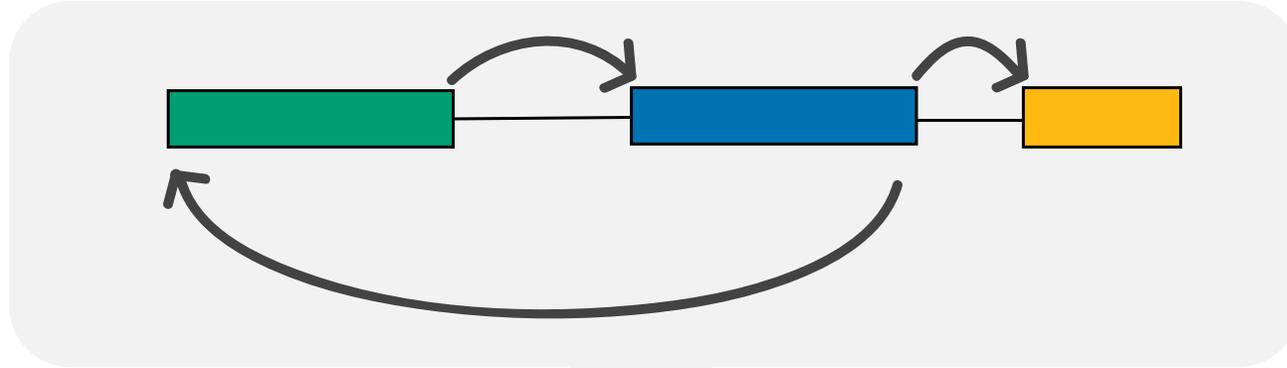
volcanoplot (bladder cancer versus control)



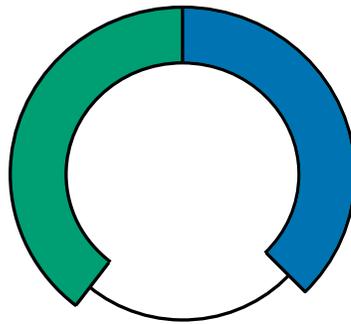
47 downregulated
mRNAs

867 upregulated
mRNAs

circRNAs are enriched in biofluids compared to tissues

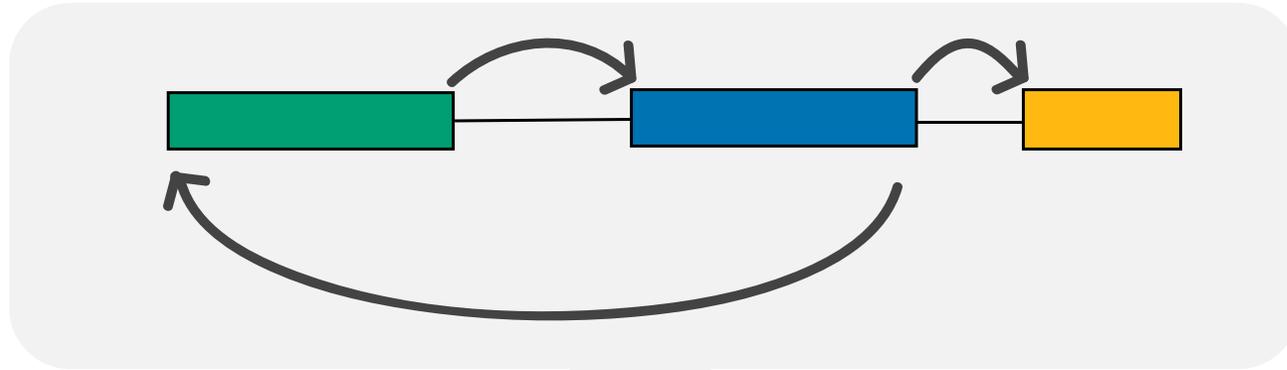


mRNA

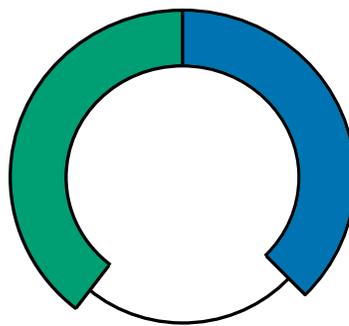


circRNA

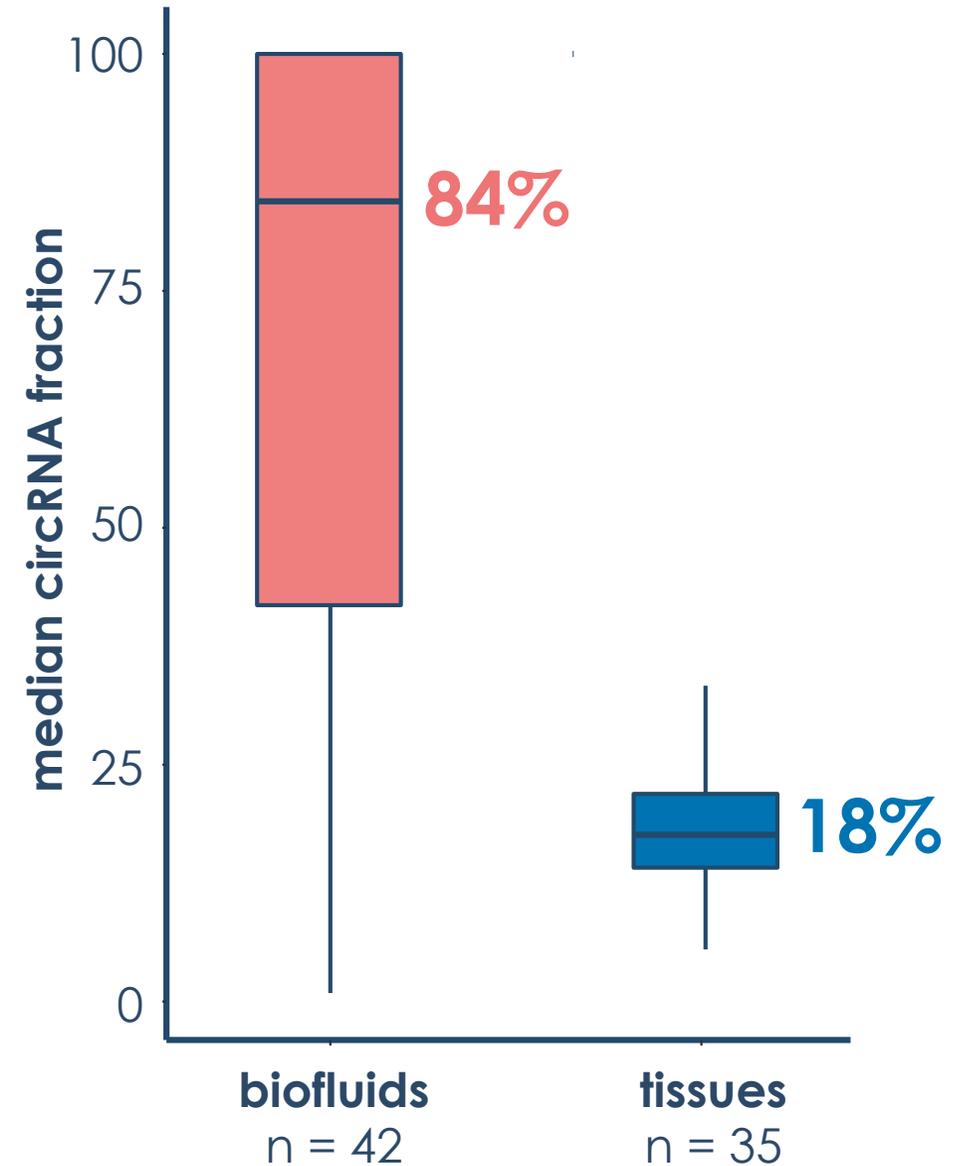
circRNAs are enriched in biofluids compared to tissues



mRNA



circRNA



Take-home messages and future perspectives

- Dare to collect and investigate “alternative” fluids
- RNA is cool!
- Our findings enable a more informed selection of the most relevant biofluid to monitor individual cancer types
- Broader sample collections in different cancer types are ongoing
- We are **open to new collaborations!**

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