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Abstract: Lipid Clocks: novel AI-powered tools to measure biological age

Research on measuring the individual aging rate of specific tissues and organisms has yielded various biomarkers gathered under the umbrella term of aging clocks. Lipids are universal to all living organisms and the advent of lipidomics has enabled the quantification of many thousand lipid molecules in biological samples.

However, currently deployed lipid based biomarkers are limited to coarse-grained lipid classes, instead of more specific lipid species. Individual lipid species are directly linked to metabolism, play important roles in many disease states, and are known to change dynamically with age.

Capturing the interplay and underlying complexity of the lipidome would allow to pinpoint dysregulations and detrimental shifts in metabolism that accelerate biological ageing. Therefore, we developed Lipid Clocks - AI powered, high resolution actionable lipid biomarkers - to show that the lipidome can be used to predict biological age and define aging rates of different tissues and animal models.