RESEARCH STATEMENT / POTENTIAL POSTDOCTORAL FELLOWSHIP

Metabolic signatures of cardiovascular and vascular health

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Scientific background

My work brings together quantitative NMR metabolomics, lipoprotein phenotyping and large human cohorts. During my PhD, I investigated age- and sex-specific lipoprotein variation across 31,275 serum or plasma samples from five countries, modelling reference distributions for 112 lipoprotein parameters [1]. I also contributed to MetSCORE [2], metabolomic ageing clocks and benchtop NMR quantification. I combine experimental workflows with statistical analysis, from sample preparation to interpretation.

Proposed research directions

1. Early vascular dysfunction. Determine whether detailed lipoprotein and metabolic profiles are associated with measures of endothelial function, vascular imaging or subclinical atherosclerosis in well-characterised human cohorts.

2. Inflammation and cardiometabolic risk. Examine whether inflammatory biomarkers and metabolic signatures provide complementary information on vascular health, accounting for age, sex, adiposity and other clinical determinants.

3. Risk stratification and metabolic ageing. Test whether deviations from expected age- and sex-specific molecular profiles predict incident cardiovascular outcomes or improve established risk models, using longitudinal data and independent validation where available.

What I bring to a host laboratory

Experience in quantitative biofluid profiling, large-scale cohort analysis, reference percentile modelling, multivariate statistics and biomarker development; a collaborative approach to integrating analytical and clinical expertise. I am particularly interested in patient cohorts, population studies and biobanks, with opportunities to learn vascular phenotyping and complementary omics approaches.

Fellowship collaboration

I am seeking a host with complementary clinical, epidemiological or vascular expertise to jointly define a feasible research question, training plan and competitive fellowship proposal. The specific aims and analytical design would be tailored to the host, accessible datasets, ethical approvals and the funding scheme.

Selected references

[1] Conde R et al. EBioMedicine. 2025;122:106021. doi:10.1016/j.ebiom.2025.106021

[2] Gil-Redondo R et al. Cardiovasc Diabetol. 2024;23:272. doi:10.1186/s12933-024-02363-3