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20th Anniversary

P6

Survival and Genetic Analysis of CMR-derived Cardiovascular Markers

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Background

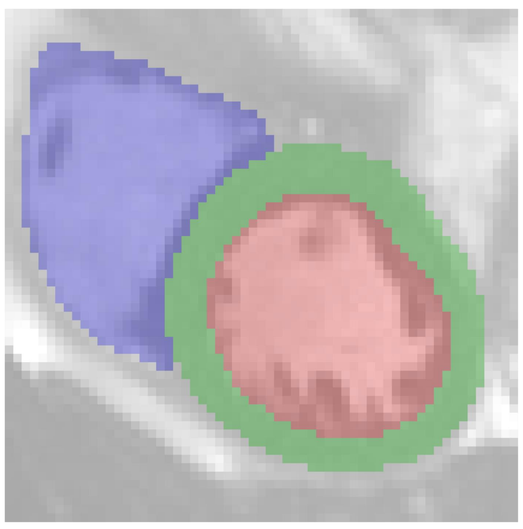
Data from the UK Biobank
40’000 CMR images
Whole genome sequencing
Hospitalization / death events

Aims

Identify prognostic markers of cardiovascular health that can serve as inclusion criteria or secondary endpoints in future clinical trials

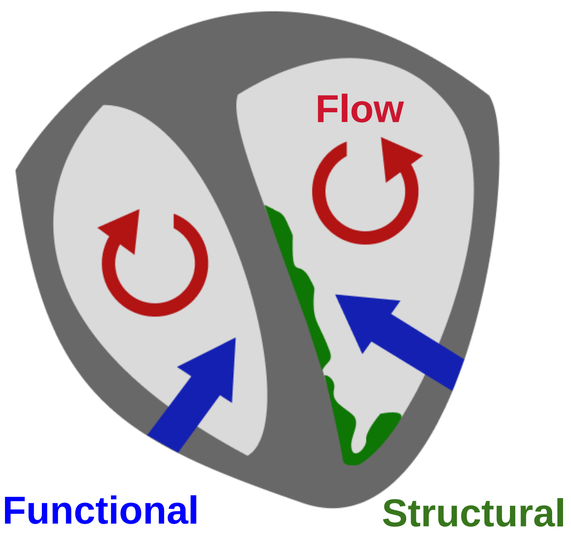
Image Processing

Automatically Segment CMR Image with a deep-learning based method



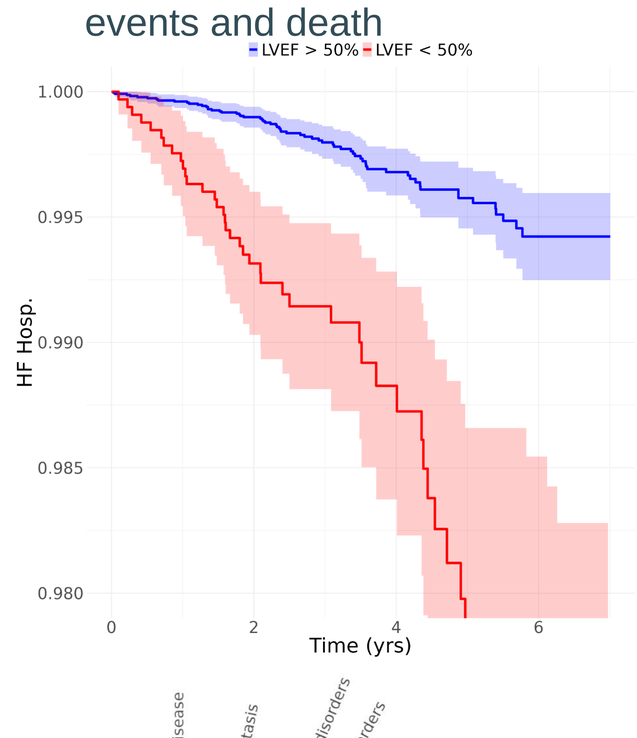
Biomarker Extraction

Based on prior knowledge of cardiac function



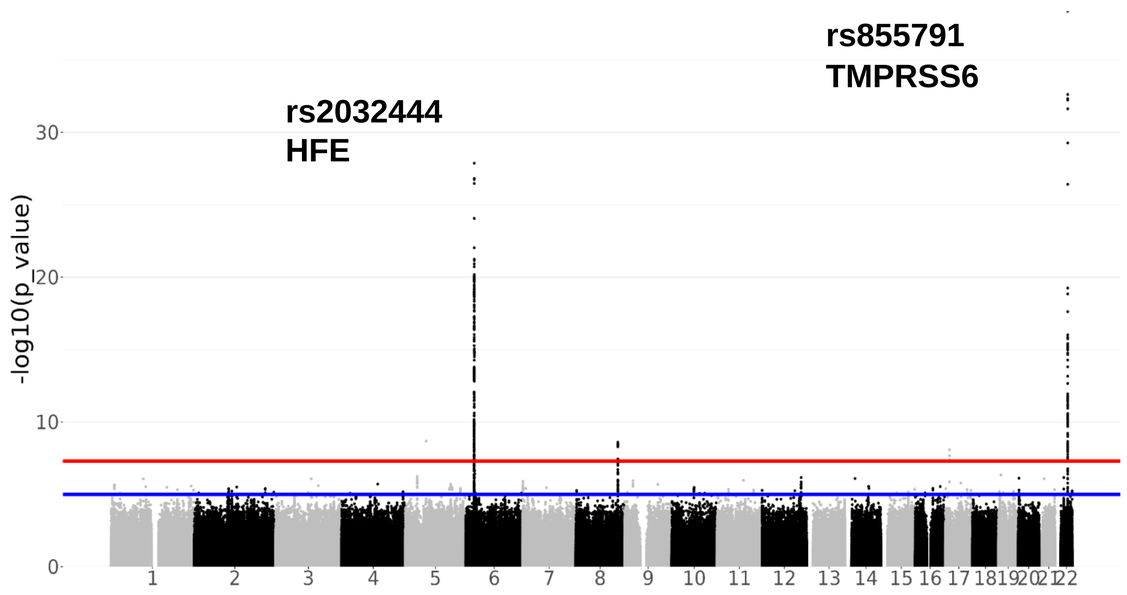
Survival Analysis

Test each marker for an effect in hospitalization events and death

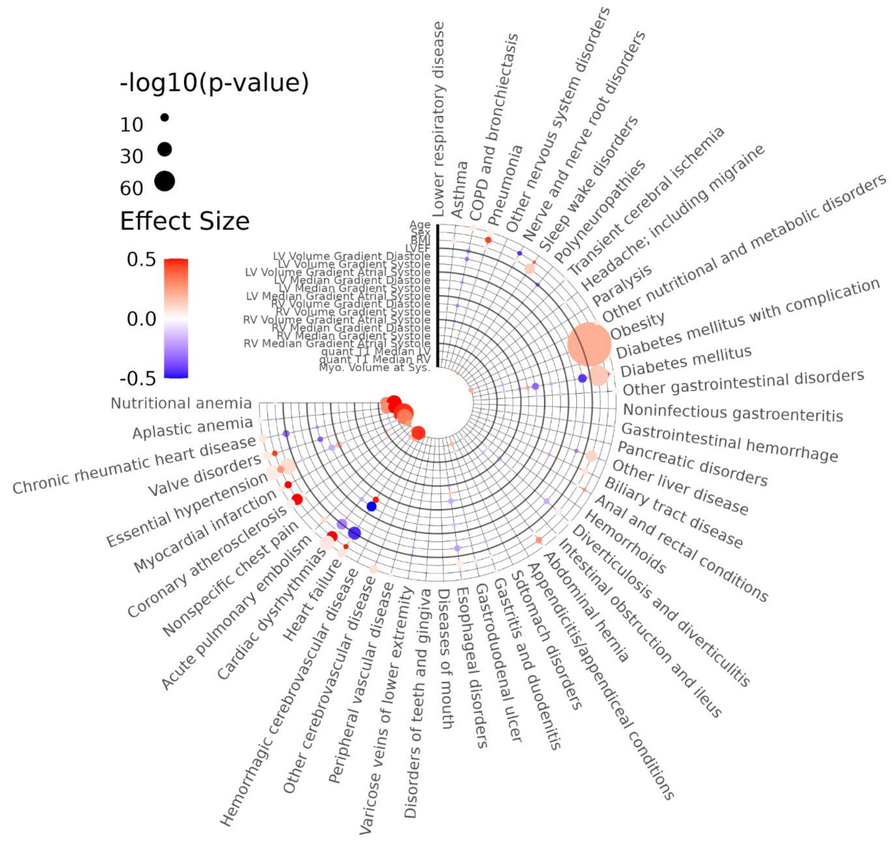


Genetic Studies

Find genetic mutations, genes and molecular pathways associated with each marker to identify potential treatment targets



- Genome-wide Association Studies
- Gene-set Enrichment Analysis
- Mendelian Randomization



Conclusion

Combining MRI, deep-learning, and genomics allows to identify novel prognostic CMR-derived marker and to understand their underlying biological mechanisms

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