

# Tangible heart, silicon brain

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# Propositions

Belonging to the thesis:

## Tangible Heart, Silicon Brain

### Computational Modelling of Cardiovascular Diseases

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1. PRDM1 is a key transcription factor regulating T cell activity in the ruptured plaque, which could serve as a target for intervention in rupture-associated immune responses (this thesis).
2. Integrative multi-omics analysis outperforms models based on a single-omics data layer for predicting high-risk plaque in terms of model robustness, biological significance and clinical translatability (this thesis).
3. The established plaque-specific genome-scale metabolic network represents a referential metabolic map of human atherosclerosis, that will facilitate further explorations of disease-associated metabolites and reactions in the arterial wall by CVD researchers (this thesis).
4. Systemic changes in circulation following acute myocardial infarction will induce significant reprogramming of human macrophages with functional repercussions that impact the healing process (this thesis).
5. *In silico* high-throughput omics analysis can be performed in a hypothesis-free manner without biasing towards a pre-established assumption, providing unprecedented implications and directions for further exploration (this thesis).
6. Just like for autonomous driving, there is a long road ahead for *in silico* medicine, but the day will inevitably come that we will all adopt and embrace AI-based precision medicine.
7. Innovations often emerge at the intersection of multiple disciplines.
8. Learning a programming language is similar to learning a foreign language – it requires continuous learning, practice, implementation, and the space to make mistakes.
9. “Dry-lab” scientists should also visit the “wet lab” to see what happens in the real world, to know how data are generated, and to experience and enjoy the beauty of an experiment.
10. Promising results may emerge, even when you feel dispassionate, disappointed or frustrated. No matter what happens, keep calm and carry on.

Han Jin

Maastricht, 4<sup>th</sup> August, 2021