Organs-on-chip: towards therapies for cardiovascular disease using human stem cells

Helden, R.W.J. van

Stellingen behorende bij het proefschrift getiteld Organs-on-chip: towards therapies for cardiovascular disease using human stem cells

1. "We're moving towards such a strange time. A time when all our moral choices will be complicated and compromised by our love of progress." **— Michel Faber, The crimson petal and the white**. *We scientists must not lose sight of our morality in the pursuit of progress.*
2. Immature hiPSC-derived cardiomyocytes recapitulate early signs of pathology seen in COXPD8 patients, suggesting a predisposition to disease development possibly masked by compensatory mechanisms. **— This thesis**
3. Cardiac MTs provide a versatile model for investigating multi-cell responses in cardiac diseases, allowing for the identification of specific cell types contributing to disease phenotypes and the evaluation of genetic variants' pathogenicity. **— This thesis**
4. "The popular assumption that mitochondria are relatively uniform 'powerhouses' passively distributed across the body mainly to subserve energy demands is evidently limited." **— Monzel *et al.* 2023**
5. Constant monitoring of pH and oxygen allows careful tracking of tissue culture conditions during the experimental setup of microfluidic devices, providing essential information for optimizing protocols and ensuring consistent experimental conditions between repeated experiments. **— This thesis**
6. "The unsatisfactory efficacy of drug management of HCM is likely due to the use of suboptimal preclinical testing carried out in physiologically irrelevant animals and/or by lack of consideration of the complex genotype-phenotype relationship characteristic of HCM." **—Mosqueira *et al.* 2019**
7. The early incidences of arrhythmia, triggered by decreased mitochondrial function and aberrant calcium dynamics observed in the AARS2 patient hiPSC-CM model, may reveal an underlying mechanism which could lead to the progressive nature of hypertrophic cardiomyopathy (HCM). **— This thesis**
8. "mtDNA variants can lead to energetic depletion through impaired OXPHOS and mitochondrial Ca2+ regulation, which are central for excitation-contraction coupling in cardiac cells." **— Pavez-Giani and Cyganek 2022**
9. "My new language is taking shape. It is gestalt oriented, rendering it beautifully suited for thought, but impractical for writing or speech. It wouldn't be transcribed in the form of words arranged linearly, but as a giant ideogram, to be absorbed as a whole." **— Ted Chiang, Understand**. *The way one could view the web of knowledge that the scientific community is trying to build.*
10. "A single day spent doing things which fail to nourish the soul is a day stolen, mutilated, and discarded in the gutter of destiny."**— Michel Faber, The Crimson Petal and the White**. *It is the intrinsic desire burning inside each of us that allows us to pursue that which we love.*
11. "It's science, Bob. You're not supposed to understand it." **— Bob's Burgers, Topsy**. *The common misconception that we, as scientists, have a duty to challenge and dispel.*