

Propositions pertaining to the PhD thesis

Integrated control of endothelial vasoreactivity

1. Using O₂ as terminal electron acceptor, with consequent production of reactive oxygen species, is an essential driving force for eukaryote evolution and diversification (*this thesis*).
2. After myocardial infarction, contrasting healthy flow reserve, nitric oxide does not contribute to the blunting of endothelin-mediated constriction (*this thesis*).
3. The lack of effect of pharmacological inhibition of reactive oxygen species, especially hydrogen peroxide, on the extent of exercise hyperemia reflects a compensation by other vasodilatory mechanisms. Only upon endothelial dysfunction will vasoreactivity shift to redox imbalance (*this thesis*).
4. Contribution of reactive oxygen species to the vascular tone is enhanced after myocardial infarction, with uncoupled endothelial nitric oxide synthase acting as a significant source of superoxide (*this thesis*).
5. A pro-inflammatory state before cardiac surgery is associated with oxidative tissue injury through NADPH-oxidase and the development of postoperative atrial fibrillation (*this thesis*).
6. Nothing in biology makes sense except in the light of evolution (*Dobzhansky, Biological Teaching 1973*).
7. In patients with coronary artery disease, impaired peripheral endothelial function significantly predicted cardiovascular events independent of SYNTAX score (*Matsuzawa et al, Journal of the American College of Cardiology 2013*).
8. Despite evidence indicating the predictive value for future cardiovascular events, endothelial function measurements are not included in the guidelines for prevention by either the European (European Society of Cardiology) or American (American Heart Association/American College of Cardiology) guidelines (*Flammer et al. Circulation 2013*).
9. Every biological trait requires both a proximate and evolutionary explanation, however, the field of vascular biology is focused primarily on proximate mechanisms in health and disease. In contrast, little attention is paid to the evolutionary mechanisms of the cardiovascular system (*Monahan-Earley et al. Thrombosis and Haemostasis 2013*).
10. The hallmark of biological energy transduction is non-equilibrium redox chemistry (*Falkowski et al, Philosophical Transactions of the Royal Society of London Biological Sciences 2008*).
11. Life is nothing but an electron looking for a place to rest (*Szent-Györgyi, Scientific American 2012*).