

# Oxidants and antioxidants as targets for cardiovascular disease prevention: evidence from observational and causal inference studies

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#### STELLINGEN BEHORENDE BIL HET PROFESCHRIET

## OXIDANTS AND ANTIOXIDANTS AS TARGETS FOR CARDIOVASCULAR DISEASE PREVENTION:

### evidence from observational and causal inference studies

### Leon G. Martens

- 1. Smoking increases antioxidant metabolite levels, but is nevertheless associated with oxidative stress. (this thesis)
- 2. Dietary antioxidants are unlikely to reduce the risk of developing (ischemic) stroke as they increase antioxidant levels, but maybe not activity. (this thesis)
- 3. Mitochondrial dysfunction measured in blood, as a cause of increased oxidative stress, is unlikely to be a driver of cerebral vascular disease. (this thesis)
- 4. High body mass index increases the risk of atherosclerotic cardiovascular disease, and predominantly in people of low socio-economic status (this thesis), indicating that intervention studies might be most effective in these groups.
- 5. "As chronological age advances, the levels of ROS increase in an attempt to maintain survival, until they betray their original purpose and eventually aggravate, rather than alleviate, the age-associated damage." (Hekimi, Trends Cell Biol, 2011)
- "Genome-wide association studies are promising resources for powerful Mendelian Randomization investigations" (Burgess, Genet Epidemiol, 2013), although that was not their intended purpose.
- 7. "Successful Mendelian Randomization studies allow us to approximate causal relationships" (Burgess, Int J Epidemiol, 2015), but results that can only be detected in enormous sample sizes questions the clinical relevance of the result.
- 8. "The health benefits of antioxidant agents vary based on the oxidative status of each individual" (Thomas Senoner, Nutrients, 2019). Therefore, studying antioxidant effects using a population-based approach is not sufficient to identify the real therapeutic effect.
- 9. Good writing takes time. "A thought comes when it wants to and not when I wish." (Friedrisch Nietzsche, 1886)
- 10. "Part of the journey is the end" (Iron Man, 2019) and with an end starts a new beginning.