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## **Immune modulation by helminths and the impact on the development of type 2 diabetes**

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## Stellingen behorende bij het proefschrift

### Immune modulation by helminths and the impact on the development of type 2 diabetes

1. Intensive anthelmintic treatment increases insulin resistance in helminth-infected subjects and the magnitude of change is dependent on the burden of infection. (this thesis)
2. The helminth-derived molecule omega-1 improves whole-body metabolic homeostasis independent of its Th2 polarizing capacity. (this thesis)
3. Although the number of circulating eosinophils decreases significantly after anthelmintic treatment, there is no change in the responsiveness or activation status of these cells. (this thesis)
4. Mass cytometry reveals heterogeneity of type 2 and regulatory cells driven by helminth infections; these detailed insights could help design interventions more precisely to modulate immune responses. (this thesis)
5. Genes selected to protect from starvation, infections, injury and predation may now, in the absence of some of these challenges, contribute to the increasing incidence of "modern human diseases", including obesity, type 2 diabetes, atherosclerosis, autoimmunity, allergy and certain psychiatric disorders. (Kotas & Medzhitov, *Cell*, 2015)
6. The discovery of ILC2s has radically changed our view of type 2 immunity as a process that regulates immunity to allergens and helminths into one of a vital rheostat for maintenance and restoration of homeostasis following environmental stimuli. (Lloyd & Snelgrove, *Science Immunology*, 2018)
7. Controlled human infection trials, in which healthy volunteers are experimentally infected, provide unprecedented opportunities to dissect the physiological, immunological and metabolic changes that occur upon infection. (Roestenberg et al., *Vaccine*, 2017)
8. The results of the dimensionality-reduction method t-SNE allow intuitively pleasing visualization of complex data sets. (Newell & Cheng, *Nature Immunology*, 2016)
9. Considering the population differences in immune profiles there is no such thing as a "normal" immune system.
10. Not everything that counts can be counted, and not everything that can be counted counts. (William Bruce Cameron, 1963)  
[*The CV of a scientist entails more than the number of publications or the impact factor of the journals in which he/she published in. With the increase in big data analyses, it is the challenge to stay focused on what is important.*]
11. Fieldwork in the tropics requires flexibility and creativity, but above all, the skill of turning on the generator.