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Leiden
The Netherlands

Bioorthogonal antigens as tool for investigation of antigen processing and presentation

Pieper Pournara, L.

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Stellingen behorend bij het proefschrift getiteld

Bioorthogonal Antigens as Tool for Investigation of Antigen Processing and Presentation

- 1.** The problem of antigen processing is one of kinetics, topology, and chemistry rolled into one. [this thesis chapter 1]
- 2.** Using bioorthogonal antigens (instead of pre-labelled reporter antigens) for intracellular antigen tracing reduces the chance of biases in the results although it requires two reaction steps instead of one. [this thesis chapter 3]
- 3.** Fluorophore modified antigens preclude the study of any post-translational modification of lysine residues, such the antigen carbamylation that occurs in rheumatoid arthritis (Trouw *et al.* 2017²⁶²). [this thesis chapter 5]
- 4.** The poor predictability of adverse/unexpected (CD4-)T cell responses seen with using artificial intelligence (AI)-based optimized neo-epitope vaccines (Ott *et al.* 2020⁶⁹) demonstrates the enormous complexity of the human immune system and indicates the need for further fundamental research. [this thesis chapter 6]
- 5.** It is not easy to convey to laymen how scientists can develop a vaccine against COVID-19 in 1 year but have not managed to eradicate HIV since 1984.
- 6.** Bioorthogonal chemistry can find an application in organ on a chip models to replace animal experimentation and help to expand this technology from experimental to translational research (Rogozhnikov *et al.* 2016³⁰⁸).
- 7.** Fear is part of human nature. Dealing with fear of a virus on the one hand and fear of a vaccine on the other hand needs a multidisciplinary approach no matter how irrational the fear is from a scientific point of view.
- 8.** Open vaccine patents can save lives.
- 9.** The essence of a (bio)orthogonal reaction is that one pair of reaction partners is inert to interaction with other surrounding ones. The essence of intellectual interaction in research should be the opposite.
- 10.** COVID has turned the Netherlands not just into a nation of football coaches and epidemiologist, but also budding immunologists. The latter should be fostered.

These propositions are considered opposable and defensible and as such have been approved by the promotor, co-promotor and the Dean.