# Glucocorticoid modulation of the immune response: Studies in zebrafish

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# Propositions

accompanying the dissertation

## Glucocorticoid modulation of the immune response

### Studies in zebrafish

1. Glucocorticoids inhibit the differentiation of macrophages towards a pro-inflammatory phenotype (This thesis, Chapter 3).
2. Glucocorticoid treatment increases the severity of bacterial infections by decreasing the phagocytic activity of macrophages (This thesis, Chapter 4).
3. Glucocorticoids modulate the function of macrophages not only by altering their transcriptional response to a stimulus, but also by changing their transcriptome prior to stimulation (This thesis, Chapter 3 and 4).
4. The zebrafish model enables visualization and quantification of the bio-distribution, the therapeutic effects and side effects of novel nanoparticle-based glucocorticoid therapies *in vivo* (This thesis, Chapter 5).
5. The outcome of glucocorticoid treatment is context dependent.
6. Targeted drug delivery is a more promising direction for alleviating side effects of glucocorticoids than developing selective glucocorticoid receptor agonists.
7. Macrophages are the main targets for the therapeutic effect of glucocorticoids in various inflammatory diseases, such as contact allergy and septic shock (Tuckermann et al., 2007, J Clin Invest 117, 1381-1390; Kleiman et al., 2012, Faseb j 26, 722-729).
8. In addition to its critical role in host defence, the inflammatory response is indispensable during tissue repair and regeneration.
9. The aim of scientific research is to find regular patterns in chaos and paradox.
10. No one can succeed without help from others.

**Yufei Xie, Leiden, 26 November 2020**