

## Evaluation of immune response in small animal models by *in vivo* imaging

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Optical *in vivo* imaging is an attractive way of assessing gene expression due to its non-invasive nature and low cost. It is a powerful way to study the kinetics of expression of reportable genes, which makes it suitable for evaluation of the *in vivo* efficiency of genetic vaccines. Bioluminescence imaging is optimal for *in vivo* monitoring of both the reporter gene expression and the immune eradication of the reporter-expressing cells. We have previously shown that co-injection of luciferase (Luc) gene reporter together with DNA-immunogen leads to immune clearance of Luc/reporter-expressing cells, which correlates with a potent anti-immunogen response of both CD4<sup>+</sup> and CD8<sup>+</sup> T-cells. Little is, however, known about the effects of the type of immune response on the dynamics of this clearance. To address this, we have immunized BALB/c mice intradermally with DNA-immunogens inducing strong Th1- (HIV-1 protease, PR) or Th2-shifted immune response (HIV-1 reverse transcriptase, RT). Expression of the reporter was first registered 2 hours after delivery and followed for the next 21 days. Expression kinetics was identical up to day 9 post immunization. From day 9, signal in Th2-type responding RT-immunized mice decreased significantly faster compared to the signal registered in Th1-type responding PR-mice. Statistically significant correlations were found between bioluminescence intensity and Th-profile and potency of immunogen-specific cellular responses. Collectively, these results indicate that *in vivo* imaging data can substitute *in vitro* immunoassays and predict the outcome of DNA-immunizations already at an early stage.

### Biography

Petkov Stefan has completed the first year of his PhD studies at Karolinska Institute and is currently working on the application of non-invasive optical imaging for evaluation of DNA vaccine performance.

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