



Vabilo na Preglov kolokvij / Invitation to the Pregl colloquium

Prof. Dr. Ralf Wagner

Institute of Medical Microbiology and Hygiene, University Regensburg, Germany

Email: ralf.wagner@ur.de

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Velika predavalnica Kemijskega inštituta /
Great Lecture Hall, National Institute of Chemistry;
Hajdrihova 19, Ljubljana

Synthetic biology toolbox supporting HIV vaccine development: from bench to bedside

Developing a safe and protective HIV vaccine is one of the most ambitious missions in current vaccinology. Here we show that by applying principles of Synthetic Biology - knowledge-based in silico gene- and protein design, in vitro evolution technologies and antigen delivery via modified DNA- or poxviral vectors - we were able to come up with vaccine candidates that proved to induce immune responses in HIV negative volunteers closely matching those responses seen in long term non-progressing individuals.

Knowledge-driven in silico design was initially based on the sequence of a high incidence HIV clade. Design steps towards improved T cell immunogens comprised (i) selection and assembly of relevant epitopes supporting efficient cross presentation of immunogens to dendritic cells, (ii) RNA and codon optimization for maximal expression and (iii) exclusion of deleterious sequences and functional protein domains imposing safety concerns. Such designer genes were synthesized cloned into a (i) DNA and (ii) a poxviral vector chassis for appropriate antigen delivery. B cell candidate vaccines are currently being engineered based on available structural information of the viral envelope protein and selected using a recently developed cell display system, which takes advantage of a defined panel of broadly neutralizing antibodies.

Preclinical and clinical data will be presented highlighting immunogenicity of the tested candidate vaccines.



info: roman.jerala@ki.si

Vljudno vabljeni / Kindly invited