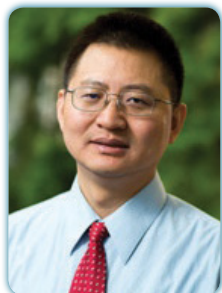


# 4<sup>th</sup> International Conference and Exhibition on **Immunology**

September 28-30, 2015 Crowne Plaza Houston River Oaks, Houston, TX, USA



**Yongqun He Oliver**

University of Michigan Medical School, USA

## **Rational vaccine design using reverse vaccinology, database data analysis and literature mining**

Rational vaccine design has been a hot research topic in the past decade. Different strategies can be used for rational vaccine design. In my talk, I will present our research on rational design using three different strategies. The first strategy is reverse vaccinology, a post-genomics vaccine design method that starts from bioinformatics analysis of the whole genome sequences of pathogens with the aim to identify ideal genes for vaccine development. We have developed Vaxign (the first web-based reverse vaccinology software program). The predicted features in the Vaxign pipeline include antigen sub-cellular location, adhesin, epitope binding to MHC class I and class II, and sequence similarities to human, mouse and/or pig proteins. Vaxign has been used in many vaccine design projects. The second rational design strategy is the targeted data analysis of valuable databases. For example, the VIOLIN vaccine database system includes many individual databases for collecting manually curated data related to different vaccine components, such as protegen for vaccine protective antigens, Vaxjo for vaccine adjuvants, Vaxvec for vaccine vectors and DNAVaxDB for DNA vaccines. The query and analysis of the structured data recorded in these databases provide valuable clues for rational vaccine design. For example, the analysis of protegen and DNAVaxDB may identify vaccine antigens and DNA vaccine plasmids, respectively, that are most suitable for your vaccine design. The third strategy is high throughput literature mining, which may help identify ideal vaccine candidates and gene functions valuable for vaccine design. We have developed community-based vaccine ontology (VO) and found that VO can be used to enhance vaccine literature mining and support vaccine design. Lastly, different vaccine design strategies can be integrated to achieve the best results in rational vaccine design.

## **Biography**

Yongqun He Oliver is an Associate Professor in the University of Michigan Medical School, Ann Arbor, MI, USA. He has strong backgrounds in microbiology, immunology, veterinary medicine and bioinformatics. He practiced as a veterinarian for two years, earned his PhD in Immunology, and obtained his MS in Computer Science. He has done intensive research in the areas of host-pathogen interactions and vaccine research. He is also experienced in developing and applying bioinformatics technologies in immunology studies. He has published over 100 peer-reviewed papers and book chapters, and served as an Editorial Member for many journals and a grant reviewer for different funding agents.

[yongqunh@med.umich.edu](mailto:yongqunh@med.umich.edu)

## **Notes:**