

**Title:**

Software demonstration: Prediction of vaccine targets using the Vaxign reverse vaccinology program

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Vaxign is a web-based software program that supports genome-wide vaccine design using the strategy of reverse vaccinology (<http://www.violinet.org/vaxign/>). As required by the reverse vaccinology strategy, Vaxign predicts vaccine targets by bioinformatics analysis of genome sequences based on different criteria. The genome sequences come from pathogenic strains, non-pathogenic strains (optional), and host species (human, mouse, or pig). Predicted features in the Vaxign pipeline include protein subcellular location, transmembrane helices, adhesin probability, conservation among pathogenic strains, sequence exclusion from genomes of nonpathogenic strains, sequence similarity to host proteins, and epitope binding to MHC class I and class II. Vaxign contains precomputed predictions for over 200 genomes and also allows dynamic vaccine target prediction based on users' input sequences. Vaxign has been widely used now in the vaccine research community. To facilitate the use of Vaxign by more vaccine researchers, we propose to provide hands-on tutorial in the ICoVax-2012 workshop with step-by-step instructions on how to navigate through the Vaxign software website. Two use cases will be tested: (1) Enterohemorrhagic *Escherichia coli* (EHEC) O157:H7 vaccine target prediction; (2) Human Herpesvirus 1 (HSV-1) vaccine target prediction. The O157:H7 use case is mainly for showing some general features for bacterial vaccine target prediction, such as the prediction of secreted and outer membrane proteins and transmembrane helices. The second HSV use case is mainly for demonstrating the Vaxign analysis of sequence conservation and the prediction of MHC class I and II epitopes. To save time, we will mainly use the pre-computed results. We will also go through how to set up your own account in Vaxign for your analyzed data storage and collaboration with others. We will also be ready to ask any questions throughout this training exercise. If possible, we would like to reserve at least one hour for the whole software demo and hands-on training.