2006 Annual Immune Epitope Database and Discovery Workshop Meeting Report Executive Summary

The Third Annual Immune Epitope Database and Discovery Workshop was held November 7 and 8, 2006 at the Marriott North Bethesda Hotel and Conference Center in North Bethesda, Maryland. The meeting provided an opportunity for the contractors of the Immune Epitope Database and Analysis Resource (IEDB) and the Large Scale Antibody and T Cell Epitope Discovery programs to present their project status and plans and to discuss common interests.

The two-day meeting started with a presentation of the status of the IEDB. The IEDB became operational in February 2006 with its beta release (www.immuneEpitope.org). Enhancements and bug fixes have resulted in six subsequent builds being released to present. Database improvements have included browsing and visualization features, as well as enhancements to the curation interface and partial automation of the curation process. Considerable effort has been spent in literature curation, and most of the relevant epitope references for NIAID Category A, B, and C Priority Pathogens and Emerging/Re-emerging infectious diseases have been curated. Interactions with the Large Scale Antibody and T Cell Epitope Discovery groups have been initiated and data from some groups submitted.

As a result of feedback from the tool workshop last November, numerous enhancements were added to the analysis and epitope prediction tools in the IEDB Analysis Resource (http://www.immuneepitope.org/tools.do). A special emphasis was placed on developing antibody epitope prediction tools, including an antibody tool workshop in September, and several new tools are currently being integrated. An analysis of all published Influenza A antibody and T cell epitopes was conducted to provide a demonstration of the capability of the IEDB and the tools in the Analysis Resource. This analysis was recently published in the Proceedings of the National Academy of Sciences (2007, Vol. 104, pp246-251).

To increase the visibility of the IEDB and build a user base, the IEDB team interacted with the scientific community via conferences and publication, including an exhibit booth at the 2006 AAI meeting, developed cross-linking arrangements with other databases (including the NIAID-sponsored Bioinformatics Resource Centers: http://www.niaid.nih.gov/dmid/genomes/brc/), and collaborated in ontology development with OBI- Ontology for Biomedical Investigation (http://obi.sourceforge.net/)

Plans for the coming year include improving usability; curating references for prioritized infectious diseases, allergies, and autoimmune diseases; working with the Discovery Groups to submit data; add capability to the Analysis Resource, especially for antibody epitope prediction; and expand the visibility of the IEDB through conferences, links with other databases, and ontology collaboration.

Dr. John Altman, Emory University and NIH Tetramer Facility Director, gave a presentation on the NIH Tetramer Core Facility resource. The NIH Tetramer Facility (http://www.niaid.nih.gov/reposit/tetramer/index.html) provides custom MHC class I tetramer production for a large number of mouse, non-human primate, and human MHC molecules. In addition to MHC Class I tetramer production, the NIH Tetramer Facility also offers: (1) Human

and mouse CD1d tetramers; (2) Two alpha-galactosylceramide analogues: OCH and alpha-C-galactosylceramide; (3) Custom class II MHC reagents for four distinct HLA-DR alleles; and (4) Tetramers with an expanded range of fluorophores. Dr. Altman's presentation was followed by fourteen 40 minute presentations by the Large-Scale Antibody and T Cell Epitope Discovery contractor teams . The project title and the principal investigators, in the order they presented, are listed at the end of the Executive Summary.

The Workshop concluded with a discussion session, which dealt with data submission from the Discovery groups to the IEDB. The process for submitting data was reviewed and a tentative submission policy was introduced. The IEDB project team reiterated its commitment to assist the Discovery groups with the direct submission process.

The Fourth Annual Immune Epitope Database and Discovery Workshop will be held on November 14 and 15, 2007.

1.1 Presentation Titles

The Immune Epitope Database and Analysis Resource
Principal Investigator: Alessandro Sette, Ph.D.
La Jolla Institute for Allergy and Immunology

NIH Tetramer Core Facility
Principal Investigator: John Altman Ph. D.
Vaccine Research Center, Emory University

Antibodies for Epitope Mapping and Neutralization
Principal Investigator: Kim Janda, Ph. D.
The Scripps Research Institute

Epitope Discovery in Francisella tularensis
Principal Investigator: Jeffrey Frelinger, Ph.D.
University of North Carolina

Large Scale Antibody and T Cell Epitope Discovery Program, "Yellow Fever Virus T-cell Epitope Discovery"
Principal Investigator: J. Thomas August, Ph.D.
Johns Hopkins University School of Medicine (JHU).

Rapid Identification and Characterization of T Cell Epitopes Encoded by Ebola Virus and Mycobacterium tuberculosis Genes
Principal Investigator: Kent J. Weinhold, Ph.D.
Duke University Medical Center

Naturally Processed Poxvirus-Specific CTL Epitopes: Discovery and Characterization
Principal Investigator: Sebastian Joyce, Ph.D.
Vanderbilt University

Influenza & West Nile Virus Direct Epitope Identification

Principal Investigator: William Hildebrand, Ph.D.
University of Oklahoma

Analysis of CD4 T cell epitopes for the principal antigens of B. anthracis and Y. pestis
Principal Investigator: Daniel M. Altmann, Ph.D.
Human Disease Immunogenetics Group,
Hammersmith Hospital, Imperial College

Class I and class II restricted epitopes from a representative sample of the different arenavirus species pathogenic in humans
Principal Investigator: Alex Sette, Ph.D.
La Jolla Institute for Allergy & Immunology

Title: Prediction of peptide binding to HLA class I molecules
Principal Investigator: Soren Buus, M.D., Ph.D.
University of Copenhagen

Discovery of epitopes of NIAID category A-C pathogens using Bioinformatics and immunology
Principal Investigator: Ole Lund, Ph.D.
Technical University of Denmark

Mapping of CD4+ T cell epitopes with class II tetramers.
Principal Investigator: William Kwok, Ph.D.
Benaroya Research Institute at Virginia Mason

T cell epitopes of Vaccinia virus in immunized donors
Clemencia Pinilla, Ph.D.
Torrey Pines Institute for Molecular Studies, San Diego, CA

M. Tb Specific human CD8 TCells antigens and epitopes
Principal Investigator: David Lewinsohn, M.D., Ph.D.
Oregon Health and Science University

Identification of class I and class II restricted epitopes derived from variola and vaccinia viruses
Principal Investigator: Alex Sette, Ph.D.
The La Jolla Institute for Allergy & Immunology