

OVERVIEW

The Vaccine Immunology Statistical Center (VISC) is organized within the CAVD to provide services in the areas of statistical design and data analysis, a central repository for data from key CAVD studies, and support for laboratory data management. The diverse staff at VISC has expertise in the areas of biostatistics, immunologic assays, bioinformatics, data management, and information systems.

VISC ensures that CAVD studies are efficient by providing state-of-the-art statistical methods and, when required, develop novel methods. Specific areas of novel methodological development are the design of repeated low-dose challenge non-human primate studies, the analysis of immunologic checkerboard data, signal processing, normalization and analysis of flow cytometry-based assays and HIV antigen microarrays, and network models for the analysis of multivariate outcomes in mouse immunogenicity experiments. The VISC team also designs data models for novel immunologic assays and engineers integrated data pipelines from lab instruments to the CAVD central data repository. Finally, VISC staff support data access, data sharing, and collaboration through a customized web portal available to the large community of CAVD investigators.

The VISC assembles interdisciplinary teams to work on specific CAVD collaborative research projects. Through its work on each project, VISC identifies best practices for study designs and data analysis, develops new and improved existing online tools, and settles upon standard nomenclatures and data formats to facilitate data sharing and communication. In this way, project-specific solutions to research problems become platforms on which the larger research program can be based.

RESEARCH OBJECTIVES

- 1.) Increased knowledge of potential immune correlates obtained from active/passive immunization strategies (Study designs and data analyses).
- 2.) Improved tools and approaches to generating, processing and interpreting assay data (Data pipelines and methods).
- 3.) Improved assay data quality and the effectiveness of data operations services (Data ops and study management).
- 4.) Increased viewing and utilization of CAVD data for independent and cross-study analyses (Data base and web portal).

PROGRESS

The VISC continues to devote a large portion of its efforts towards assisting the CAVD Vaccine Immune Monitoring Consortia (VIMCs) with assay development and testing and data operations support for specific CAVD projects. These activities include improved data management, information exchange with investigators and lab personnel, study design, and statistical analysis.

The primary focus of VISC has naturally shifted from infrastructure development and data operations to scientific collaboration. Recent biostatistical collaboration projects include:

- Correlates analysis for non-human primate vaccine study featuring a VSV vector.
- Analyze data generated by the Fc Core, a new addition to the CAVIMC.
- Characterize antigen-specific B cells by analyzing data generated from transcriptomics, flow cytometry, and B-cell receptor sequencing.
- Conduct of analysis of non-human primate studies to help inform regimen dose and scheduling as the candidate vaccine components move forward into Phase I clinical trials.
- Conduct of analysis of data derived from novel vaccine candidates in human clinical trial to aid in the characterization of the vaccine elicited immune responses.
- Conduct of analysis of several antibody-effector function assays to characterize and compare their correlations and utilities in differentiating clinical samples.
- Development of methods for ICS polyfunctionality, peptide microarray and Fluidigm single-cell data to improve the efficiency, standardization and throughput of the analyses of these data.
- Development of methods for the quality control, normalization and analysis of peptide antigen microarray data; analyses of these data to identify signatures predictive of a broad neutralization phenotype.

Grant at a Glance

Principal Investigator

Raphael
Gottardo, PhD



Grantee Institution

Fred Hutchinson
Cancer Research Center,
Seattle, USA

Project Title

Vaccine Immunology Statistical
Center

OPPID

1151646

Grant Award

Up to \$15.1 million, awarded
October, 2016

External Scientific Advisory Board

- ◇ Dean Follmann, National Institute of Allergy and Infectious Diseases
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