Subject: Dissertation Defense - Michael Landivar, Phd Biosciences
Date: Thursday, March 5, 2026 at 4:20:07 PM Eastern Standard Time
From: SSB Faculty List on behalf of Diane St. Germain
To: SSB-FACULTY-LIST-L@LISTSERV.GMU.EDU

Dissertation Defense Announcement
To: The George Mason University Community

Candidate: Michael Landivar

Program: PhD in Biosciences

Date: March 17, 2026

Time: 3:00 PM Eastern Time (US and Canada)

Location: In Person, IABR Room 1004, Science & Tech campus, Manassas VA 20110
and Via Zoom
Join Zoom Meeting
https://gmu.zoom.us/j/91326694881?pwd=YKtb1epiNGQguEAhgnx3E7xCX5TmA1.1

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Committee Chair: Dr. Alessandra Luchini
Committee members: Dr. Gabriel Parra, Dr. Amanda Still, Dr. Ancha Baranova

Title: Determinants of Effective Antibody Responses to Pandemic

Noroviruses

Abstract: Noroviruses are the leading cause of acute viral gastroenteritis worldwide, yet vaccine development has been hindered by extensive genetic and antigenic diversity, particularly within the globally dominant GII.4 genotype. This dissertation examines how viral evolution, capsid structure, and antibody recognition collectively determine effective humoral immune responses to pandemic noroviruses. Using an integrated approach combining population genomics, structural analyses, and functional immunoassays, this work focuses on antigenic site A of the GII.4 capsid, a highly variable and immunodominant region implicated in immune escape and cross-reactivity. Bioinformatic analyses of over 3,100 GII.4 capsid sequences were coupled with characterization of monoclonal antibodies and polyclonal sera using virus-like particle–based binding and histo-blood group antigen blocking assays, including a modified antigen competition assay. Despite its variability, antigenic site A was a frequent target of cross-blocking antibodies, particularly in responses elicited by contemporary variants. Importantly, non-neutralizing cross-reactive antibody responses did not interfere with the activity of neutralizing antibodies, indicating that ineffective protection is not due to antagonism by non-blocking antibodies. Instead, antibody competition analyses demonstrated that capsid geometry and Fc-mediated steric hindrance restrict epitope accessibility, limiting synergistic neutralization by antibodies elicited to different antigenic sites. Together, these findings define key determinants of norovirus immune recognition and provide guidance for rational vaccine design against this fast-evolving virus.

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