Subject: Thesis Defense - Elizabeth Barrow, MS in Biology
Date: Wednesday, April 1, 2026 at 9:54:03 AM Eastern Daylight Time
From: SSB Faculty List on behalf of Diane St. Germain
To: SSB-FACULTY-LIST-L@LISTSERV.GMU.EDU

Thesis Defense Announcement
To: The George Mason University Community

Candidate: Elizabeth Barrow

Program: M.S. in Biology

Date: April 15, 2026

Time: 12:00 PM Eastern Time (US and Canada)

Location: In Person, IABR Conference Room 1004, Science & Tech campus, Manassas VA 20110
and Via Zoom
Join Zoom Meeting
https://gmu.zoom.us/j/94962156209?pwd=inwr34mPgsAYgHW5Gk8MlhkPgDk9jj.1

Meeting ID: 949 6215 6209
Passcode: 457757
One tap mobile
+13017158592,,94962156209#,,,,*457757# US (Washington DC)
+12678310333,,94962156209#,,,,*457757# US (Philadelphia)

Dial by your location
+1 301 715 8592 US (Washington DC)
+1 267 831 0333 US (Philadelphia)
Meeting ID: 949 6215 6209
Passcode: 457757
Find your local number: https://gmu.zoom.us/u/adfcb4PHgY

Committee Chair: Dr. Yuntao Wu

Committee Members: Dr. Monique van Hoek, Dr. Aarthi Narayanan

Title: Investigation of Bioactive Actin-Derived Peptide N7

Abstract:

In the search for novel pharmaceutical compounds, bioactive peptides are one of the most promising and highly researched categories of molecules. Useful peptides are frequently found by fragmenting proteins of interest and isolating sequences necessary for the protein's function(s). The recently discovered bioactive peptide N7 is one such peptide, derived from human β-actin. Actin is a highly conserved eukaryotic cytoskeletal protein involved in fundamental cell processes. N7's sequence overlaps with a key binding site for actin regulating proteins. N7 has been demonstrated to impact multiple actin-dependent processes in CD4 T cells (Yi et al. 2026). We hypothesize that N7 modulates the actin cytoskeleton by interfering with the binding of ABPs to actin. In this study, I begin an investigation into the effects of N7 on the behavior and morphology of epithelial cells. Cytotoxicity studies indicate that N7 is bioactive across a broad range of concentrations and better tolerated at higher doses than in T cells. Using actin staining and fluorescent microscopy, N7 is observed to induce cell-wide disorganization of actin filaments after 4 and 6 hours of incubation with A549 cells. Low doses of N7 enhance the migration of A549 lung epithelial cells into an artificially created wound area. Together these results reinforce conclusions drawn from work with T cells: N7 triggers cycles of actin polymerization/depolymerization and treadmilling, altering cell-wide cytoskeletal dynamics, particularly impacting cortical-actin-dependent cellular processes. The ability to manipulate the actin cytoskeleton in vitro on demand by a short incubation with a non-toxic peptide has potential applications in research and in medicine.

###