Subject: Dissertation Defense - Paul Montgomery, PHD Bioinformatics & Computational Biology
Date: Thursday, January 29, 2026 at 11:30:07 AM 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: Paul Montgomery

Program: PhD in Bioinformatics & Computational Biology

Date: February 13, 2026

Time: 4:00 PM Eastern Time (US and Canada)

Location: Zoom Meeting
Topic: Paul Montgomery Dissertation Defense
Time: Feb 13, 2026 04:00 PM Eastern Time (US and Canada)
Join Zoom Meeting
https://gmu.zoom.us/j/93620118897?pwd=2q9bVacf23aRan5BlOCh68b5BUA8vt.1

Meeting ID: 936 2011 8897
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One tap mobile
+13017158592,,93620118897#,,,,*735693# US (Washington DC)
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Committee Co-Chair: Dr. Dmitri Klimov
Committee Co-Chair: Dr. Tobin J. Dickerson
Committee member: Dr. Jeffrey L Solka

Title: Novel Applications of a Dermal Biomarker Patch Platform in Skin Diseases for the Potential Use in Biomarker Identification and Guided Treatment

Abstract: This dissertation collectively advances the field of dermatologic precision medicine through the development, validation, and application of a minimally invasive dermal biomarker patch (DBP) platform integrated with machine learning-

based transcriptomic analysis. This study established the predictive validity of DBP-derived transcriptomes for classifying psoriasis patients' responses to major biologic drug classes (IL-23, IL-17, and TNF-α inhibitors). Using next-generation sequencing and supervised machine learning, predictive classifiers achieved >90% positive predictive value and demonstrated that 99.5% of patients were likely to respond to at least one biologic class—an important step toward personalized therapy selection. Complementary validation work expanded the DBP technology beyond psoriasis. In atopic dermatitis patients treated with dupilumab, DBP-based transcriptomics reliably captured temporal molecular responses, demonstrating normalization of inflammatory gene expression and barrier restoration over 24 weeks.

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