Christopher M. Zarbock

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Present Positions

Fellowship in Clinical Informatics   July 2023 - June 2025
Washington University School of Medicine   St. Louis, MO
Department of Pediatrics

Fellowship in Molecular Genetic Pathology   July 2023 - June 2024
Washington University School of Medicine   St. Louis, MO
Department of Pathology and Immunology

Education and Training

Residency in Clinical Pathology   July 2020 - June 2023
University of Minnesota Medical School   Minneapolis, MN
Department of Laboratory Medicine and Pathology

Residency in Integrated Vascular Surgery   July 2018 - June 2020
Maine Medical Center   Portland, ME
Department of Vascular Surgery

Doctor of Medicine   May 2018
University of Wisconsin School of Medicine and Public Health   Madison, WI

Bachelor of Engineering in Engineering Sciences   June 2012
Thayer School of Engineering at Dartmouth College   Hanover, NH
Concentration in Biomedical Engineering

Bachelor of Arts in Biomedical Engineering Sciences   June 2012
Dartmouth College   Hanover, NH
Honors, *Magna Cum Laude*

Board Certifications

American Board of Pathology   June 3, 2023 - Present
Diplomate, Clinical Pathology

Informatics Experience

Clinical Service

Informatics Rounds   July 2023 - Present
Regularly meet to address informatics requests including exploring test utilization through analysis of data pulled from Epic SlicerDicer, Epic MyReports, Epic Clarity, and Cerner Millenium.

Weekly CMIO Huddles   July 2023 - Present
Attend to understand and discuss system-wide informatics issues.

Revising Molecular Care Testing Pathway
March 2022 - Fall 2022

Helped clarify current ordering practices for molecular testing including performing a subanalysis of the number of touch points and turn around time for a site within the M Health Fairview system.

LIS Legacy Data Archiving Project
Spring 2022 - Fall 2022

Assisted in validating the search functionality through helping develop and then test various use cases.

CAP Synoptic Update Testing Validation
Spring 2022

Aided in transitioning the AP Beaker implementation of the June 2021 CAP synoptic checklists.

Teaching / Education

Epic Provider Wellness Workshop
February 21, 2024

Helped teach a session on finding things in Epic as part of a half-day event to equip providers with practical Epic tools.

Skills

Analytics

- Proficient in R and much of the tidyverse
- Experienced in Python and many of its data analysis tools including Pandas, SciPy, and NumPy

Digital Pathology

- Knowledgeable in QuPath for whole slide imaging analysis
- Experienced with whole slide imaging scanners, including Aperio CS2
- Skillful with Aperio eSlide Manager image management software

Epic Physician Builder Basic and Advanced
July 2023

Epic Notecraft for Physicians
July 2023

Quality Improvement

Retrospective Review of Duplicate Order Clinical Decision Support Tool
August 2023 - Present

Performed a retrospective analysis in Python of duplicate order alert clinical decision support (CDS) tools for several laboratory tests to better understand and hopefully improve those tools.

Molecular Pathology Experience

Clinical Service

Next-Generation Sequencing Assay Interpretation
November 2023 - Present

Templated hematologic malignancy (primarily myeloid), solid tumor, and constitutional (particularly somatic mosaicism) cases for signout.

Molecular Testing Triage
November 2023 - Present

Assisted clinicians in ordering appropriate molecular testing given patient presentation and helped coordinate the send out of complex testing.

Development of VAF visualization tool   April 2024 - Present

Developed a tool in R to plot variant allele fractions over time as these data were previously only available as a list.

Molecular Diagnostic Laboratory Acting Director   June 2024

Reviewed *BCR*::*ABL1* test results and assisted the laboratory medicine resident on call with molecular testing triage.

Teaching / Education

GOAL Hands-On NGS Bioinformatics Bootcamp   Spring 2024

Helped teach molecular genetic pathology fellows the basics of an NGS bioinformatics pipeline including troubleshooting connecting to a remote virtual machine and entering terminal commands.

Co-Faculty:

Eduardo Castro-Echeverry, MD, Somak Roy, MD, Srikar   Virtual sessions
Chamala, PhD, and Eitan Halper-Stromberg, MD, PhD

Understanding the Next-Generation-Sequencing Bioinformatics   March 15, 2023
Pipeline: A Hands-on Approach

Helped teach participants the basics of an NGS bioinformatics pipeline including troubleshooting command line issues.

USCAP 112th Annual Meeting   Short Course 50
Advisors: Eduardo Castro-Echeverry, MD, Somak Roy,   New Orleans, LA
MD, and Kenneth Youens, MD, MBA

Assay Development

Developing in-house *APOE* genotyping assay for lecanemab   October 2023 - Present
toxicity risk assessment

We saw an increase in *APOE* genotyping requests following recent FDA approval of lecanemab and thus sought to bring this test in-house.

Simulated Cepheid Xpert Xpress Multiplex Vaginal Panel   Spring 2024
(MVP) Assay Onboarding

As a part of this simulated exercise we discussed assay choice and validation and quality management for a new bacterial vaginosis test.

Archer Fusion Panel Validation   June 2021 - July 2021

Assisted in validation of this panel through checking for additional negative fusion partners as a part of the negative control.

Publications and Presentations

Journal Publications

Kennedy PM, **Zarbock CM**, Burke BA, Diamond SG. Effect of deep breathing on extracted oxygen and cerebral hemoglobin levels. Annu Int Conf IEEE Eng Med Biol Soc. 2011;2011:1021-4. doi: 10.1109/IEMBS.2011.6090237. PMID: 22254486.

Posters and Presentations

Haplotect: a robust haplotype-based method to detect and quantify DNA contamination in next-generation sequencing data

November 2024

Platform Presentation and Poster - Abstract submitted

Association for Molecular Pathology Annual Meeting and Expo

Andrew Hughes, MD, PhD, **Christopher M. Zarbock, MD**, Alnoor, MD, Haley Abel, MD, Eric Duncavage, MD, David Spencer, MD, PhD

Vancouver, Canada

Retrospective Review of Duplicate Order Clinical Decision Support Tool Performance Within A Large, Tertiary Healthcare System

May 21, 2024

Short Oral Presentation

Association for Pathology Informatics 2024 Summit

Advisor: Ronald Jackups, MD, PhD

Ypsilanti, MI

Molecular evidence of differentiation syndrome following menin inhibitor treatment in a patient with relapsed acute myeloid leukemia

November 17, 2023

Case Study Presentation

Association for Molecular Pathology Annual Meeting and Expo

Advisors: Andrew Hughes, MD, PhD and Yi-Shan Lee, MD, PhD

Salt Lake City, UT

Prevalence of Bacteremia Due to *Streptococcus/Enterococcus* Species at an Academic/Community Health System Over a Five Year Period

June 9, 2023

Utilized the R programming language to analyze blood culture data for *Streptococcus* and *Enterococcus* species at M Health Fairview laboratories.

University of Minnesota Department of Laboratory Medicine and Pathology

ACLPS 58th Annual Meeting Poster Presentation

Advisor: Patricia Ferrieri, MD

Charlottesville, VA

Novel BRAF activating mutation in a case of hyalinizing trabecular tumor of the thyroid November 4, 2022

Case Study Presentation

Association for Molecular Pathology Annual Meeting and
Expo

Advisors: Siddhartha Sen, MD, PhD and Emilian Racila, MD Phoenix, AZ

Digital Image Analysis Utilizing an Artificial Neural Network in the Quantification of Bone Marrow Fibrosis on Reticulin-Stained Trephine Core Biopsies Fall 2021 - Winter 2022

Developed a digital image analysis algorithm using pixel classification trained via an artificial neural network emphasizing linear shapes for the quantification of bone marrow fibrosis.

University of Minnesota Department of Laboratory USCAP 2022 111th Annual Meeting Poster Presentation
Medicine and Pathology

Advisor: Bartosz Grzywacz, MD Los Angeles, CA

A Rapid Technique to Address Recall Bias Without a 2-Week Antegrade Washout Period in the Validation of Whole Slide Imaging for Histopathological Primary Diagnosis Fall 2020 - Winter 2021

Helped to validate a technique which enabled rapid whole-slide imaging validation.

University of Minnesota Department of Laboratory USCAP 2021 110th Annual Meeting Poster Presentation
Medicine and Pathology

Advisor: Oyedele Adeyi, MD Virtual conference

ADDITIONAL RESEARCH EXPERIENCE

Updating Program Capability to Interface with New Data Format Summer 2015

Revised MATLAB code to allow for processing of new high-density electroencephalogram data format.

Shapiro Summer Research Program Wisconsin Sleep Center

Advisor: David Plante, MD, PhD Madison, WI

Worked on Indicator of CREB Activation due to Phosphorylation (ICAP) Sensor through use of Directed Evolution Techniques Sept. 2012 - June 2013

Updated sensor fluorophores and worked on development of high-throughput screen to process a large number of variants.

Fulbright Grant Research Max Planck Institute of Neurobiology

Advisor: Oliver Griesbeck, PhD Martinsried, Germany

Optimizing Homologous Recombination in _T. saccharolyticum_ Winter 2012 - Spring 2012

Explored one way of creating gene knockouts in an anaerobic bacterium. This knowledge could ultimately be used to explore gene function in this organism.

Honors Thesis Thayer School of Engineering at Dartmouth College

Advisor: Lee R. Lynd, PhD Hanover, NH

Development of Improved Genetically Encoded Calcium Indicators   Summer 2011

Helped conduct directed evolution experiments to find improved variants of GECIs. These protein constructs exhibit a change in fluorescence when bound by calcium and enable the tracking of action potentials and other calcium-dependent events.

Max Planck Internship   Max Planck Institute of Neurobiology
Advisor: Oliver Griesbeck, PhD   Martinsried, Germany

LEADERSHIP

Management and Leadership Development Program, Dartmouth College   Winter 2011

Continued developing leadership skills such as negotiation and motivating followers through attending workshops put on by different leaders.

United States Air Force Academy Cadet   2008 - 2009

Learned about leadership through following others.

Senior Patrol Leader, Troop Guide (Boy Scouts of America)   2006 - 2007

Devised and carried out scouting events. Supervised development of those in the troop.

COMMUNITY INVOLVEMENT

Wisconsin Health Literacy   Spring 2017

Co-taught a course introducing non-native English speakers to prescription medications.

Blaine Center (Men's Homeless Shelter)   November 2013 - March 2014

Served dinner to and conversed with homeless men from the Seattle community.

Dartmouth Cancer and Patient Services (CAPS)   Spring '11 & '12, Winter '12

Helped a patient with yard work, assisted individuals in signing up for the bone marrow registry, and helped paint a residence for outpatients receiving care near Hanover, NH.

Students Fighting Hunger   Fall 2011

Helped prepare meals for the underprivileged in the Hanover, NH area.

Chippewa Falls, WI Open Door Clinic   Fall 2010

Registered new patients, updated patient records, and worked on updating a drug database.

Awards and Honors

Association for Pathology Informatics 2024 Summit Travel Award   2024

USCAP 2022 Annual Meeting Pathologist-in-Training Travel Award   2022

Association for Pathology Informatics 2021 Summit Travel Award   2021

U.S. Student Fulbright Award   2012 - 2013

U.S. Department of State award to expand perspectives through academic and professional advancement and cross-cultural dialogue. This award enabled me to conduct research at the Max Planck Institute for Neurobiology.

DAAD Graduate Scholarship Award   2012 - 2013

Awarded, chose Fulbright grant.

Phi Beta Kappa   2012

Academic honor society.

Tau Beta Pi   2012

Engineering honor society.

Richard W. Olmsted 1932 (Thayer 1933) Prize   2012

Awarded to a Dartmouth senior majoring in Engineering Sciences to recognize outstanding performance in the major.

E.A. Neufeld Endowed Scholar Recipient   2010 - 2012

Awarded to a Dartmouth student, preferably from Wisconsin, who demonstrates personal and academic promise.

Presidential Scholar Research Assistantship at Dartmouth College   Summer 2010, Winter 2011

Howard Hughes Medical Institute Fellow   Winter 2010

Monroe Fellow (United States Air Force Academy)   2009

Membership in this fellowship was awarded to approximately six cadets who excelled academically in my class of more than 1000. Its members shared an interest in learning for learning's sake and engaged in intellectual events such as book discussions.

Scholar Program Member (United States Air Force Academy)   2009

Limited to roughly the top 60 cadets in academic standing in each class. Members may take special seminar sections of normal course offerings in which scholarly discussion is encouraged.

Two-Time Recipient of Superintendent's List Honor (United States Air Force Academy)   2008 - 2009

Earned when one's grade point average, physical education average, and military performance average are greater than 3.0 at the United States Air Force Academy.

Eagle Scout Award   2007