



AMERICAN
OTOLOGICAL
SOCIETY



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“Neutrophil and Toll-Like Receptor Four Contributions to Endotoxemia-Enhanced Aminoglycoside Ototoxicity” FELLOWSHIP GRANT 2014-2015

Amount Awarded by AOS: \$54,500 (2)

Ongoing Funding:

2024: Iowa Institute for Artificial Intelligence – Internal Pilot Grant (\$15,000)
2022: PhRMA Foundation – Health Equity Challenge Award Winner (\$10,000)
2022: 76’ers Philadelphia NBA team philanthropic donation to Jefferson Screening Van (\$75,000)

2022: American Head and Neck Society Cancer Prevention Community Service Award (\$1,000)
2022: Goldman Humanism Honors Society Grant. DEAFMed: A Jefferson MD-student led initiative for Deaf education in MD school (\$1,500)
2015-2018: NIH NIDCD F30 – Combined MD/PhD Specific Fellowship Grant – (\$186,090)

PUBLICATIONS:

Urdang ZD, Bills JL, Cahana DY, Muldoon LM, Neuwelt EA. *Toll-like Receptor 4 Signaling and Downstream Neutrophilic Inflammation Mediate Endotoxemia-Enhanced Blood Labyrinth Barrier Trafficking*. *Otology & Neurotology*, 2020. 41(1), Pg. 123-132. PMID: 31568132.

Urdang ZD, Kargbo IM, Noss EE, McNair C, Jin H, Cottrill EE, Winer-Jones JP. *Federated EHR Database via A Public-Private Partnership to Enhance Healthcare Equity By Disparity Discovery and Equitable Clinical Trial Recruitment*. Invited manuscript to *Journal of Healthcare for the Poor and Underserved*, 2022. 33(5), Pg. 124.

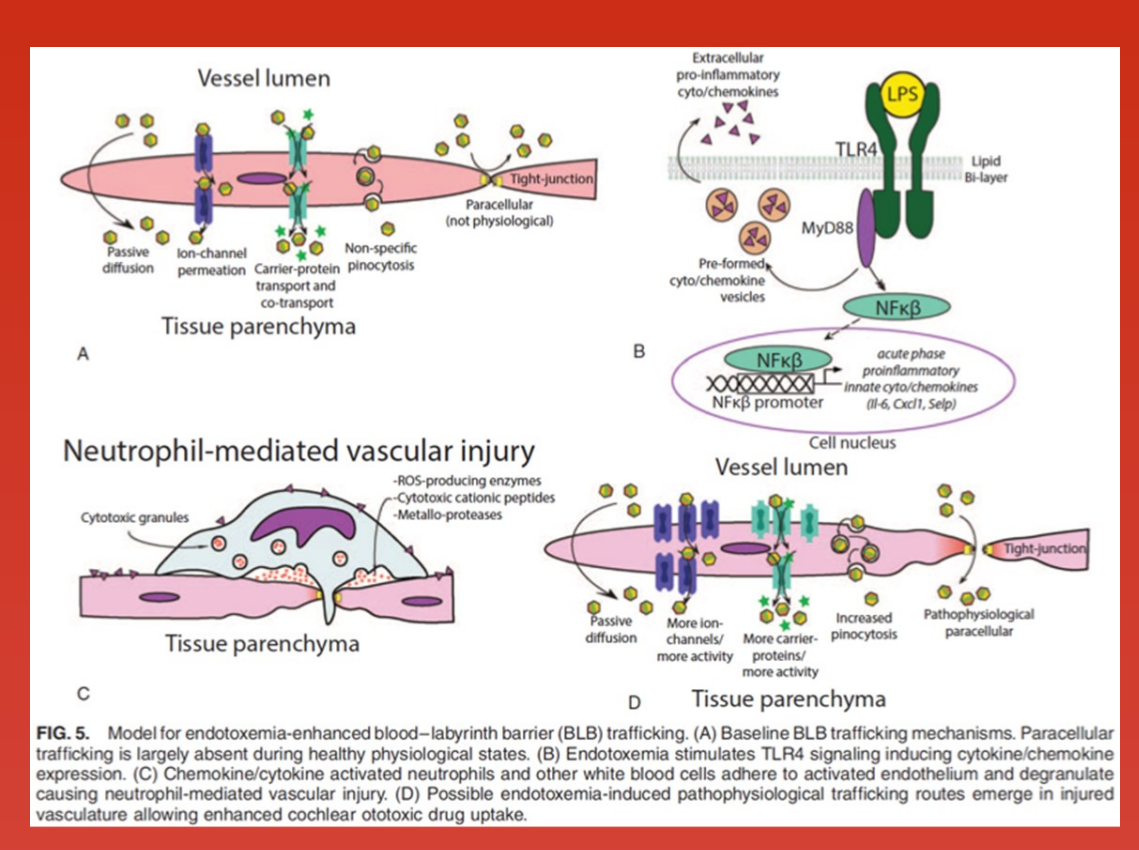
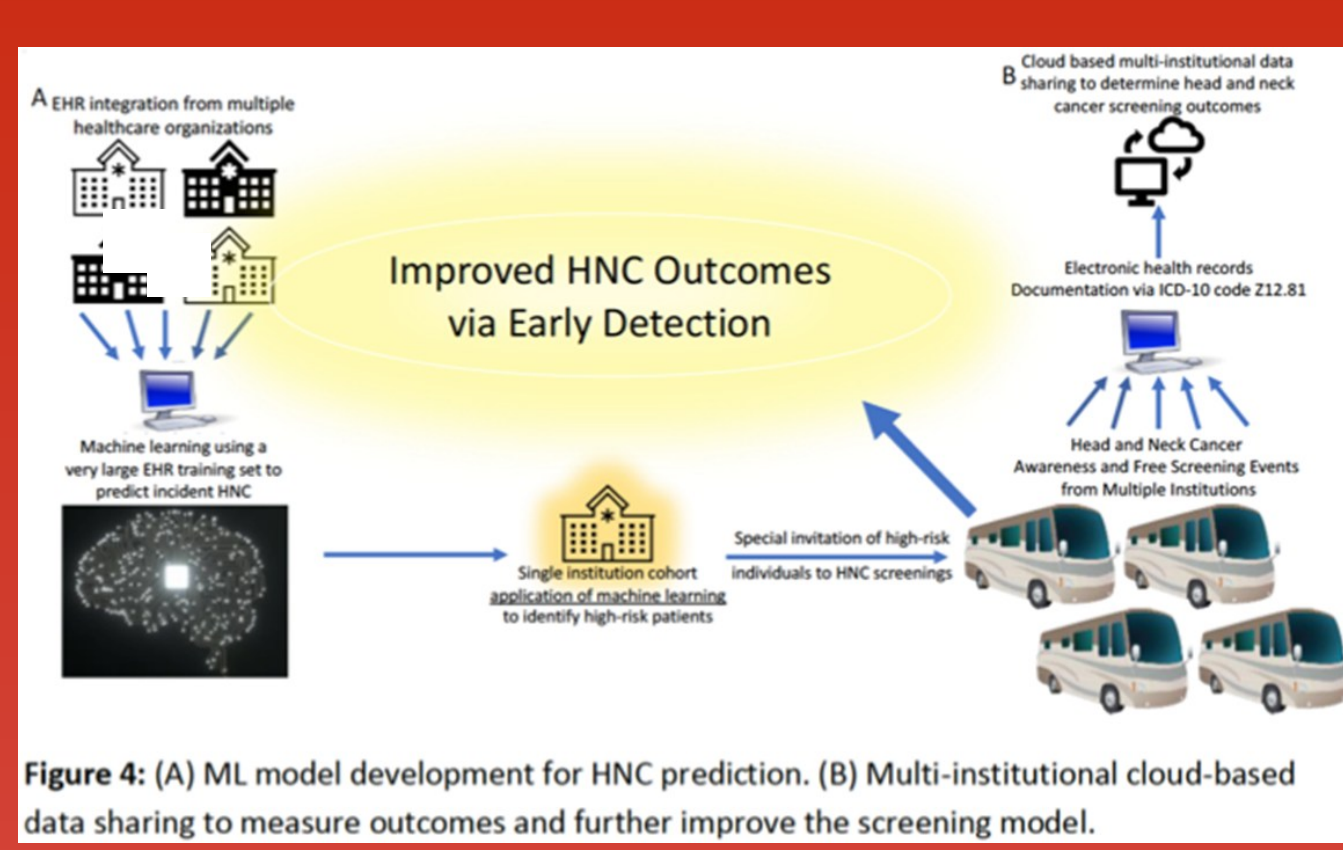
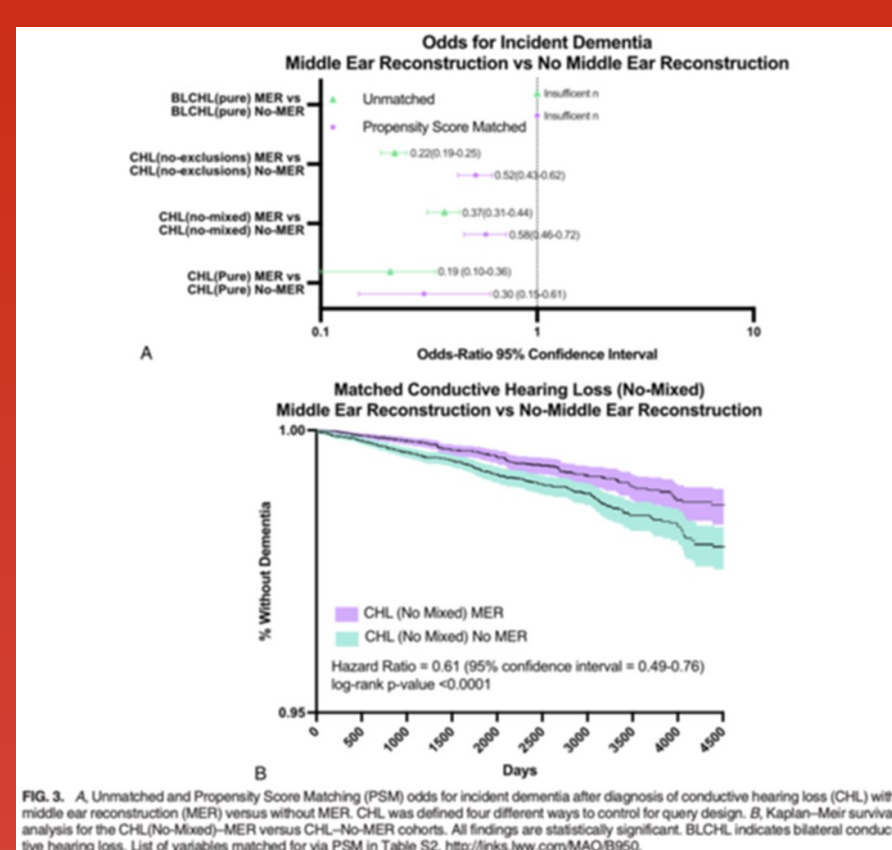
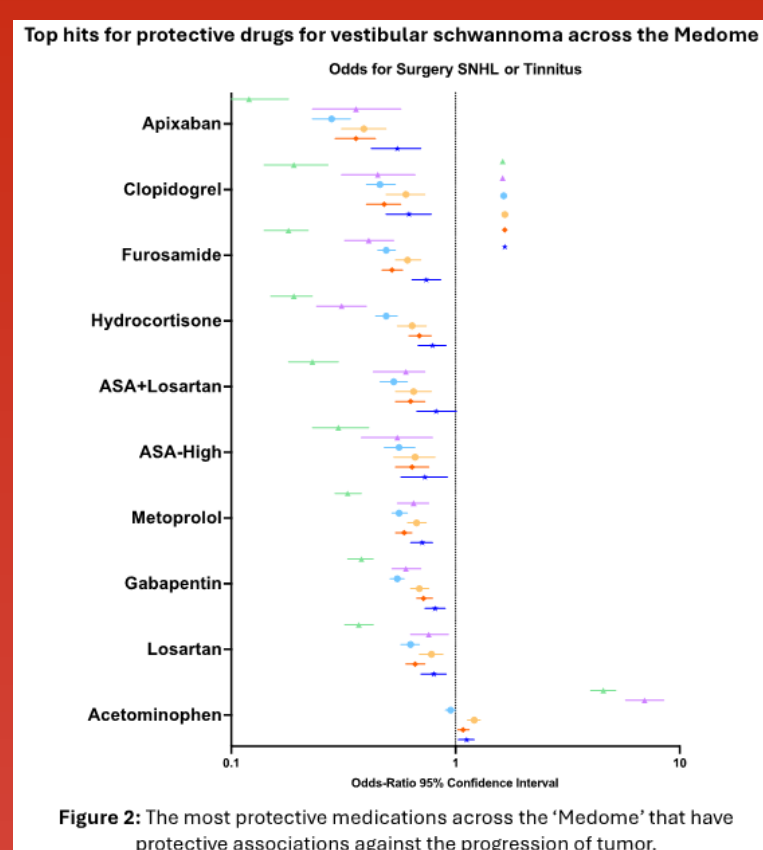
Urdang ZD, Jain A, Li M, Haupt TL, Wilcox TO, Chiffer RC, Gurgel RK. *Conductive Hearing Loss Associates with Dementia and Middle Ear Reconstruction Mitigates This Association: A Multinational Database Study*. *Otology & Neurotology*, 2024. 45 (9), 1078-1086. PMID: 39167564.

Urdang ZD, George-Jones N, Musa M, Al-Qurayshi Z, Pagedar NA, Cottrill EE, Cognetti DM, Mady LJ, Curry JM. *Head and Neck Cancer Screening Value Enhancement Via Machine Learning to Predict Diagnoses*. Presented at AAO-HNSF September 2024 as a late breaking abstract. In-submission.

Urdang ZD, George-Jones N, Shamin H, Eckard P, Gantz B, Hansen M, Bennion D, Claussen A. *Aspirin, Losartan, and Unbiased Discovery of Medications Associated with Improved Vestibular Schwannoma Outcomes – A Multi-National Database Study*. Presented at AAO-HNSF ANS Skull Base Tumor Study Group 2024.

RESEARCH SUMMARY:

Enhanced blood-labyrinth barrier trafficking during sepsis requires down-stream neutrophil activity. Using neutropenic mice this work demonstrates that both up-stream cyto/chemokine signaling, and down-stream neutrophil activity are required to enhance trafficking at the blood-labyrinth barrier.



OUTCOMES:

Cytokine signaling alone is insufficient for fully enhanced blood-labyrinth barrier trafficking during sepsis.

Neutrophils are key factors required for enhanced blood-labyrinth barrier trafficking during sepsis and subsequent ototoxicity.

Dr. Urdang has published and mentored numerous data science papers in otolaryngology across the sub-specialties with a personal focus/interest in otology/neurotology.

FURTHER FUNDING HAS ENABLED US TO EXPAND OUR RESEARCH TO:

Since completion of his MD/PhD with OHSU Dr. Urdang has completed two postdocs with Jefferson U. and U. Iowa focusing on data science and machine learning. Dr. Urdang also completed a professional certificate from MIT in data science and machine learning. His work spans otolaryngology subspecialties with a focus on otology. His future research will focus on pediatric otolaryngology with a focus on otology/neurotology.

LAY SUMMARY OF FINDINGS AND IMPLICATIONS OF THIS RESEARCH:

This work describes the key role that an immune cell called the neutrophil plays to enhance inner-ear drug transport in critically ill patients. We demonstrate that molecular signaling is insufficient on its own to enhance inner-ear drug trafficking in critically ill patients and that downstream neutrophils are required to enhance the risk of hearing loss. If you are interested in working with Dr. Urdang clinically or for data science research, please reach out at zachary.urdang@gmail.com