

Nicholas Ryan Ladwig

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Assistant Professor of Clinical Pathology
Pathology
School of Medicine

EDUCATION

2006 – 2010	University of Wisconsin, Madison	B.S.	Biomedical Engineering
2010 - 2014	The Ohio State University College of Medicine	M.D.	
2014 - 2018	University of California, San Francisco	Resident	Anatomic and Clinical Pathology
2018 - 2019	University of California, San Francisco	Fellow	Surgical Pathology
2019 - 2020	University of California, San Francisco	Fellow	Gynecologic Pathology

HONORS AND AWARDS

2008	Gundersen Lutheran Sponsored Research Fellowship	Gundersen Health System
2010	Tau Beta Pi Engineering Honor Society	University of Wisconsin, Madison
2014	Emmerich von Haam Pathology Award	The Ohio State University
2017	Award for Clinical Excellence	University of California, San Francisco - Anatomic Pathology

CLINICAL ACTIVITIES SUMMARY

My role as the UCSF Gynecologic Pathology Fellow is primarily as a diagnostic surgical pathologist focusing on gynecologic malignancies. I spend the majority of my time working with the Gynecologic Pathology Faculty reviewing surgical pathology slides that are sent to us by pathologists or gynecologic oncologists from other institutions who wish to obtain a second opinion on diagnostically challenging cases. In addition, I spend one week each month reviewing in-house gynecologic pathology cases from UCSF with anatomic pathology residents/fellows in a "pre-attending" role. I also provide consultation to the trainees and pathology assistants in the gross room at Mission Bay to assist with processing/interpretation of gynecologic frozen sections sent to us from the operating room and to assist with sectioning of specimens for microscopic evaluation. Finally, I re-review pathology cases to help resolve diagnostic/management issues as one of the pathologists who participate in the multidisciplinary gynecologic oncology tumor board and gynecologic dysplasia conferences at UCSF.

PROFESSIONAL ORGANIZATIONS

MEMBERSHIPS

2014 - present	American Society for Clinical Pathology
2015 - present	United States and Canadian Academy of Pathology
2015 - present	College of American Pathologists
2018 - present	California Society of Pathologists
2020 - present	International Society of Gynecologic Pathologists

SERVICE TO PROFESSIONAL ORGANIZATIONS

2016 - 2018	College of American Pathologists	Laboratory Inspector (2 lab inspections performed)
2019 - present	American Society for Clinical Pathology	Resident Representative and Pathology Ambassador

SERVICE TO PROFESSIONAL PUBLICATIONS

2019 - present Ad hoc reviewer, Diagnostic Pathology (2 papers in last 12 months)

UNIVERSITY AND PUBLIC SERVICE

SERVICE ACTIVITIES SUMMARY

I served as Clinical Pathology Chief Resident and Anatomic Pathology Chief Resident during the academic years of 2017-2018 and 2018-2019, respectively. In both years, my primary responsibilities included serving as liaison between the residents/fellows and faculty/administration while representing the collective voice of the trainees in the department of pathology, developing the trainee rotation and on-call schedules, hosting trainee feedback sessions, and serving as the primary contact for trainees who needed assistance/backup while covering their clinical duties. I also represented the

department of pathology at monthly University-wide Chief Resident Meetings with hospital leadership. During my year as Anatomic Pathology Chief Resident, I worked with the Residency Program Director to restructure the training program rotation schedule to both accommodate the service coverage needs of the department and to optimize educational opportunities for trainees.

In addition, I have served a significant role on the Digital Pathology Working Groups in order to facilitate the department-wide transition from glass slides to a fully digital workflow using whole slide digital scanning technology. I represented both the trainees and faculty in order to provide consensus recommendations for digital workstation setups, optimize workflows in the laboratory for slide scanning/distribution, validate scanning quality across various tissue types, and pilot test mock setups for digital sign out. In March of 2020, this work culminated in the the transition of UCSF Pathology to a department-wide, 100% digital workflow. My role as a digital pathology champion will continue as I will be working with both trainees and faculty who wish to develop a better understanding of how to optimize their workflow in the era of digital pathology.

UNIVERSITY SERVICE

SCHOOL OF MEDICINE

2017 - 2017 ACGME Clinical Learning Environment Review Site Visit Resident Representative

DEPARTMENTAL SERVICE

2015 - present Department of Pathology - Faculty Quality Improvement/Quality Assurance Committee Member
2016 - 2017 Department of Clinical Pathology - Quality Improvement/Quality Assurance Committee Member
2018 - 2019 Department of Anatomic Pathology - Website Improvement Committee Member
2018 - 2019 Department of Anatomic Pathology - Staff Quality Improvement/Quality Assurance Committee Member
2018 - present Department of Anatomic Pathology - Digital Pathology Working Groups Member
2017 - 2018 Department of Clinical Pathology - Chief Resident Chief Resident
2018 - 2019 Department of Anatomic Pathology - Chief Resident Chief Resident

SERVICE AT OTHER UNIVERSITIES

2010 - 2011 Columbus Free Clinic Laboratory Supervisor The Ohio State University - Columbus, OH
2013 - 2013 Ride for World Health - Events Director and Leadership Committee Member The Ohio State University - Columbus, OH

COMMUNITY AND PUBLIC SERVICE

2019 - present American Society for Clinical Pathology - Telepathology Global Health Initiative (1-2 cases / month)
Volunteer Consult Pathologist

CONTRIBUTIONS TO DIVERSITY

As a volunteer consulting pathologist for the American Society of Clinical Pathology Telepathology Global Health Initiative, I provide consultative diagnostic services as a second opinion for pathologists providing care to patients in settings with limited resources in Africa. The goals of our consultation is to provide diagnostic clarity for the patients and the clinicians who care for them, as well as providing an educational resource for the pathologists who render the primary diagnosis.

TEACHING SUMMARY

In addition to the activities listed below, I am currently transitioning into a new role as a Content Expert in gynecologic pathology for the UCSF School of Medicine Life Stages block for second year medical students. In this role, I will be overseeing and producing the content used by small group instructors and for review sessions. In addition, I will continue to participate as a medical student small group instructor during the Life Stages block.

RESEARCH AND CREATIVE ACTIVITIES SUMMARY

I have participated in several translational research studies with a primary focus on human gynecologic malignancies and the underlying molecular alterations that drive these cancers, the majority of which have been presented at the United States and Canadian Academy of Pathology annual meeting, and several of which have led to first author publications in pathology journals. I am currently working to expand my collaborative research network and am directing a study with two

European gynecologic pathologists as collaborators. In addition, I am transitioning into a role as senior advisor on upcoming projects and will be mentoring residents/fellows who will serve as first author on these projects.

PUBLICATIONS

PEER REVIEWED PUBLICATIONS

1. Sullivan HG, Bertagnoli R, Nigogosyan MA, Ladwig NR, Born HL, Cerniglia MM, Habbicht H, Mathiason MA, McHugh VL. Prevention of vertebral body-splitting fractures after multilevel ProDisc-L implantation. *Int J Spine Surg.* 2012; 6:93-102. PMID: 25694877. PMCID: PMC4300882
2. Sullivan HG, Bobenmoyer RL, Boland KM, Cerniglia MM, McHugh VL, Born HL, Mathiason MA, Ladwig NR. Physical capability outcomes after total disc replacement with ProDisc-L. *Int J Spine Surg.* 2012; 6:43-8. PMID: 25694870. PMCID: PMC4300876
3. Bourekas EC, Bell SD, Ladwig NR, Gandhe AR, Shilo K, McGregor JM, Lehman NL, Newton HB. Anaplastic papillary glioneuronal tumor with extraneural metastases. *J Neuropathol Exp Neurol.* 2014 May; 73(5):474-6. PMID: 24709681
4. Ladwig NR, Schoolmeester JK, Weil L, Chapman JS, Zaloudek C, Umetsu SE. Inflammatory Myofibroblastic Tumor Associated with the Placenta: Short Tandem Repeat Genotyping Confirms Uterine Site of Origin. *Am J Surg Pathol.* 2018 06; 42(6):807-812. PMID: 29505427
5. Ladwig NR, Umetsu SE, Zaloudek C, Rabban J, Garg K. Corded and Hyalinized Endometrioid Adenocarcinoma (CHEC) of the Uterine Corpus are Characterized by CTNNB1 Mutations and Can Show Adverse Clinical Outcomes. *International Journal of Gynecologic Pathology.* 2020. (In press)
6. Wolsky R, Devine WP, Joseph N, Sangoi A, Antonescu C, Rabban J, Zaloudek C, Ladwig NR, Garg K. Molecular, morphologic, and immunophenotypic characterization of uterine perivascular epithelioid cell tumors (PEComa) and leiomyosarcoma reveals cathepsin K, Rb, and ATRX as useful discriminatory markers. *Modern Pathology.* 2020. (Under review)

NON-PEER REVIEWED PUBLICATIONS

REVIEW ARTICLES

Ladwig N, Garg K. 2016. Endometrial stromal neoplasms: Updates in classification and common diagnostic dilemmas. *AJSP: Reviews and Reports.* 21:73-81.

OTHER PUBLICATIONS

Elsevier PathPrimer - Author/Consultant, Medical Microbiology; 2016.

Served as medical consultant and author for Elsevier PathPrimer (www.pathprimer.com), an online resource for pathologists and trainees in both anatomic and clinical pathology. Authored summaries, reference tables, and provided personal images for twenty-nine topics in medical microbiology, which are now published online.

Ladwig NR, Joseph NM, Umetsu SE. Short tandem repeat genotyping. 2018. *PathologyOutlines.com.* www.pathologyoutlines.com/topic/molecularshtandrepngenotyp.html.

SIGNIFICANT PUBLICATIONS

1. Sullivan HG, Bertagnoli R, Nigogosyan MA, Ladwig NR, Born HL, Cerniglia MM, Habbicht H, Mathiason MA, McHugh VL. Prevention of vertebral body-splitting fractures after multilevel ProDisc-L implantation. *Int J Spine Surg.* 2012; 6:93-102. PMID: 25694877. PMCID: PMC4300882

This publication is significant as it demonstrated a significant risk for full-thickness vertebral body splitting fractures during implantation of the ProDisc-L device for multilevel lumbar total disc replacement. These adverse events were reported to the FDA. I personally collected clinical and radiologic data for all patients in this study and worked with the ProDisc-L manufacturers and an international team of neurosurgeons to revise the surgical technique for ProDisc-L implantation to reduce the risk of these splitting fractures.

2. Ladwig NR, Schoolmeester JK, Weil L, Chapman JS, Zaloudek C, Umetsu SE. Inflammatory Myofibroblastic Tumor Associated With the Placenta: Short Tandem Repeat Genotyping Confirms Uterine Site of Origin. *Am J Surg Pathol*. 2018 06; 42(6):807-812. PMID: 29505427

This publication is significant as it showed a novel use of an existing molecular technique to determine maternal versus fetal origin of tumors arising in association with pregnancy, which would ultimately have a significant clinical impact for patients presenting with uterine tumors at the time of fetal delivery. The project published in one of the top 3 academic surgical pathology journals.

3. Ladwig NR, Umetsu SE, Zaloudek C, Rabban J, Garg K. Corded and Hyalinized Endometrioid Adenocarcinoma (CHEC) of the Uterine Corpus are Characterized by CTNNB1 Mutations and Can Show Adverse Clinical Outcomes. *International Journal of Gynecologic Pathology*. 2020. (In press)

This publication is significant because it defines the recurring underlying molecular alteration of corded and hyalinized endometrioid adenocarcinoma of the uterine corpus, and challenges the paradigm that these tumors are low-grade and have favorable outcomes. The identification of recurrent CTNNB1 variants in these tumors is a targetable mutation that may affect treatment for patients with this variant of endometrial carcinoma.

CONFERENCE ABSTRACTS

1. Ladwig NR, Rabban JT, Zaloudek C, Joseph N, Krings G, Garg K. Molecular Characterization of High-Grade Endometrial Stromal Sarcoma. *Modern Pathology*. Vol. 29 (Supplement 2), 293A, 2016. [2016 Annual Meeting of United States and Canadian Academy of Pathology]

2. Ladwig NR, Garg K. p53 Aberrant Endometrial Carcinomas with Loss of Staining For PTEN and/or Mismatch Repair Proteins: A Clinicopathologic Analysis. *Modern Pathology*. Vol. 30 (Supplement 2), 295A, 2017. [2017 Annual Meeting of United States and Canadian Academy of Pathology]

3. Ladwig NR, Schoolmeester J, Chapman J, Weil L, Zaloudek C, Umetsu S. Uterine Inflammatory Myofibroblastic Tumor Arising During Pregnancy: Use of Short Tandem Repeat Genotyping to Determine Site of Origin. *Modern Pathology*. Vol. 31 (Supplement 2), 433, 2018. [2018 Annual Meeting of United States and Canadian Academy of Pathology]

4. Ladwig NR, Wolsky R. SOX2 Distinguishes Squamous Cell Carcinoma of the Lower Gynecologic Tract From Endometrioid Adenocarcinoma With Squamous Differentiation. *Modern Pathology*. Vol. 31 (Supplement 2), 433, 2018. [2018 Annual Meeting of United States and Canadian Academy of Pathology]

5. Ladwig NR, Wolsky R, Sangoi A, Fadare O, Rabban JT. FOXL2 Immunoexpression in Endometrial Stromal Sarcoma and Non-Neoplastic Endometrial Stroma-Associated Lesions: A Potential Diagnostic Pitfall with Ovarian Sex Cord-Stromal Lesions. *Modern Pathology*. Vol. 31 (Supplement 2), 433, 2018. [2018 Annual Meeting of United States and Canadian Academy of Pathology]

6. Ladwig NR, Rabban, JT, Zaloudek, C, Garg, K. Corded and Hyalinized Endometrioid Adenocarcinoma of the Endometrium Shows Nuclear Beta-Catenin With Loss of E-cadherin and Pancytokeratin. *Modern Pathology*. Volume 99 (Supplement 1), 63-65, 2019. [2019 Annual Meeting of United States and Canadian Academy of Pathology]

7. Ladwig NR, Rabban JT, Stohr B, Umetsu S, Garg K, Zaloudek C. Ovarian Germ Cell Tumors in Women >35 Years of Age are Genetically Distinct From Ovarian Germ Cell Tumors in Adolescents. *Modern Pathology*. Volume 99 (Supplement 1), 65-66, 2019. [2019 Annual Meeting of United States and Canadian Academy of Pathology]

8. Therrien N, Ladwig NR, Devine W, Bean G, Garg K, Umetsu S. Aggressive Uterine Inflammatory Myofibroblastic Tumors Have Pathogenic Molecular Alterations in Addition to ALK Fusions. *Modern Pathology*. Volume 99 (Supplement 1), 115-116, 2019. [2019 Annual Meeting of United States and Canadian Academy of Pathology]
9. Jankowski T, Umetsu S, Joseph N, Wolsky N, Ladwig NR. The Combination of Aberrant p53 and Rb Immunohistochemistry is Highly Specific for Leiomyosarcoma. *Modern Pathology*. Volume 33 (Supplement 1), 1072, 2020. [2020 Annual Meeting of United States and Canadian Academy of Pathology]
10. Rabban J, Ladwig NR, Chen YY, Krings G. Tissue Detection Failure Rates for Selected Gynecologic and Breast Specimens using an FDA Approved Digital Pathology Imaging System: Practical Implications for Pathology Workflow and Patient Safety. *Modern Pathology*. Volume 33 (Supplement 1), 1890, 2020. [2020 Annual Meeting of United States and Canadian Academy of Pathology]