
Jason N. Rosenbaum, MD

Washington University, Barnes Jewish Hospital
Department of Pathology & Immunology
425 South Euclid Avenue
Campus Box 8118,
St. Louis, MO 63110

JRosenbaum@UWhealth.org
Work: (314) 747-1246
Cell: (314) 485-9413
Fax: (844) 373-1882
JasonRosenbaumMD.com

Education & Training

- 2015-2016 Molecular Genetic Pathology Fellowship,
Washington University, Barnes Jewish Hospital
Department of Pathology & Immunology
- July 2015 Diplomate, American Board of Pathology, Anatomic and Clinical Pathology
- 2011-2015 Residency Training, Anatomic and Clinical Pathology,
University of Wisconsin Hospital and Clinics
- 2011 MD, Northwestern University Feinberg School of Medicine
- 1998 BA (Honors), Molecular and Cell Biology/Integrative Biology,
Creative Writing minor
University of California at Berkeley, Berkeley, CA

Research Experience

- 2015 Self-Directed Research with Eric Duncavage, MD
Department of Pathology and Immunology
Washington University, Barnes Jewish Hospital

*Use of Next Generation Sequencing to Detects Novel ALK gene
Rearrangements and Predict Therapeutic Response in Non-Small Cell Lung
Cancer*
Developing NGS techniques for use in detection and interpretation of
chromosomal translocations

Genomic Landscape of Somatic Variants in Neuroendocrine Carcinoma
Analyzed variant calls from targeted next generation sequencing of
neuroendocrine carcinoma
- 2014-Present Research with Darya Buehler, MD, William Rehrauer, PhD, and Jennifer
Laffin, PhD
Department of Pathology and Laboratory Medicine
University of Wisconsin Hospital and Clinics

Whole Exome Sequencing of Angiosarcoma
Analyzed variant calls from whole exome sequencing of angiosarcoma tumor
samples for clinico-pathologic significance

2011-Present Self-directed research with Ricardo V. Lloyd, MD, PhD and William Rehrauer, PhD
Translational Research Initiatives in Pathology (TRIP) Laboratory
Department of Pathology and Laboratory Medicine
University of Wisconsin Hospital and Clinics

Insm1 as a marker for human neuroendocrine (NE) and neuroepithelial cancer (IRB approved and funded Pathology Department R&D Grant).
Developed RT-PCR based strategy for quantitation of *INSM1* expression in neuroendocrine cancer. Adapted anti-*INSM1* antibody for immunohistochemistry (IHC) in human formalin-fixed paraffinized tissue. Screened patient samples to correlate expression of *INSM1* with malignancy, and evaluated *INSM1* as a marker of disease

Identification of novel prognostic and therapeutic targets in neuroendocrine neoplasms using multivariate correlation of molecular, phenotypic, and clinical behavior (IRB approved and funded UW Carbone Cancer Center Grant)

Use tissue microarray to test novel and developing IHC markers for NE neoplasms and correlate with clinical and pathologic properties of the neoplasms. Apply whole exome sequencing to selected cases to attempt to identify driver mutations in NE neoplasms.

2006-2010 Research under Jaime García-Añoveros, Ph.D.
Department of Anesthesiology
Northwestern University
INSM-1 and INSM2 in mammalian neural development and evolution.
Bred *INSM-1* knockout mice and characterized phenotype. Cloned *INSM-1* and *INSM2* from primate and rodent species to compare rates of evolution and specify evolutionary differences between the species. Characterized the phenotype of *INSM-1* knockout mouse in the olfactory epithelium (OE)

2005 Medical Training, Medical Scientist Training Program
Northwestern University Feinberg School of Medicine

- 2002-2004 Research under Carole LaBonne, Ph.D.
Department of Biochemistry, Molecular Biology, and Cell Biology
Northwestern University
Pax-3 and Pax-7 transcription factors in Xenopus neural crest development.
Manipulated *Xenopus* embryos using overexpression, misexpression, and knockdown approaches to dissect the role of Pax-3 and Pax-7 homeodomain transcription factors in the induction of neural crest. Microinjection of mRNA constructs and morpholino antisense nucleotides was followed by in situ hybridization to analyze morphological changes. RT-PCR and Western blots were used to confirm embryonic results with molecular data.
- 2000-2002 Medical Training, Medical Scientist Training Program
Northwestern University Feinberg School of Medicine
- 1998-2000 Research Assistant to Kevin Padian, Ph.D.
Department of Integrative Biology, University of California at Berkeley
New material of the basal Thyreophoran Scutellosaurus lawleri from the Kayenta Formation (Lower Jurassic) of Arizona.
Described previously recovered fossil material from the basal thyreophoran dinosaur, *Scutellosaurus lawleri*. Cleaned and assembled fossil material from UC Museum of Paleontology collections. Photographed and sketched the prepared material for publication, and compared against the holotype specimen in Arizona. Analysis of the specimen led to slight revision of the phylogenetic placement of *S. lawleri* within the thyreophora.

Grants & Honors

- 2015-2017 Pilot Award, UWCCC Neuroendocrine Cancer Research Task Force and the Aly Wolff Memorial Fund for Neuroendocrine Carcinoma Research
“Identification of Novel Prognostic and Therapeutic Targets in Neuroendocrine Neoplasms Using Multivariate Correlation of Molecular, Phenotypic and Clinical Behavior”
- 2014 Michael N. Hart Research Day Resident Presentation Award
- 2014 ICPI Travel Grant, USCAP Annual Meeting, 2014
- 2012-2015 University of Wisconsin Research and Development Grant
- 2013 Best Poster Finalist, Education Category, American Society for Clinical Pathology Annual Meeting, Chicago, 2013
- 2013 University of Wisconsin Hospital and Clinics Quality Improvement Award
- 2012 Michael N. Hart Research Day Resident Presentation Award
- 2010 Morton Heller Award for Exemplary Research
- 1998 BA, High Honors in Integrative Biology

- 1998 Distinction in General Scholarship
- 1994-1998 UC Berkeley Chancellor's Scholar
Merit-based scholarship providing four years of tuition
- 1994 National Merit Scholar

Leadership

- 2015 Engaged Leadership Academy, College of American Pathologists
- 2015-present Junior member, College of American Pathologists Committee on Cancer Biomarker Reporting
- 2014 Participated in validation of microbial identification from blood cultures using MALDI-TOF
- 2012-2014 Founded and administered UW Pathology Resident Research Interest Group
- 2012 Streamlined paperwork on UWHC autopsy service
- 2011-2014 Resident Delegate to the College of American Pathologists
- 2011-2014 Founded and managed UWHC Department of Pathology and Laboratory Medicine Residency Program Wiki
- 2000-2002 Participated in Northwestern University Medical School's curriculum committee
- 2000 Founded *Dura Mater*, Northwestern University Medical School's first humor magazine
- 1995-1998 Editor-in-Chief, *The Heuristic Squelch*, University of California at Berkeley humor magazine

Presentations

- Nov 2015 "Actionable KIT Mutation in High-Grade Neuroendocrine Carcinoma"
Accepted abstract, Presentation, AMP Annual Meeting, Austin, TX
- Nov 2015 "INSM1 mRNA Expression Correlates With Functional Subtype in Neuroendocrine Neoplasms (NENs)" Accepted abstract, Poster, AMP Annual Meeting, Austin, TX
- Mar 2015 "Expression of the Neuroepithelial Marker INSM1 in Ewing Sarcoma and Other Small Round Cell Sarcomas" Poster, USCAP Annual Meeting, Boston, MA
- Mar 2015 "INSM1 Expression Correlates With Metastasis and Functional Hormone Production in Neuroendocrine Neoplasms" Poster, USCAP Annual Meeting, Boston, MA
- Aug 2014 "Whole Exome Sequencing of Angiosarcoma" Research presentation, Annual Michael N. Hart Research Day, Madison, WI
- Aug 2013 "INSM1 as a marker of malignancy in neuroendocrine and neuroepithelial cancer" Research presentation, Annual Michael N. Hart Research Day, Madison, WI

- Aug 2012 “INSM1 as a marker for neuroendocrine cancer” Research presentation, 1st Annual Michael N. Hart Research Day, Madison, WI
- Jan 2012 “Fulminant hepatitis in a neonate” Meriter Hospital Morbidity and Mortality conference, Madison, WI
- Jan 2010 “IA-1 in the development of the olfactory epithelium” Seminar, Cell and Molecular Neurology group meeting, Northwestern University
- Aug 2009 “IA-1 in the development of the olfactory epithelium” Seminar, Northwestern University MSTP retreat
- Apr 2008 “Transient expression from late progenitor to neuron of the conserved zinc finger gene IA-1 during embryonic and adult neurogenesis” Poster, Mouse Genetics Group Meeting, Center for Genetic Medicine, Northwestern University
- Nov 2007 “Transient expression from late progenitor to neuron of the conserved zinc finger gene IA-1 during embryonic and adult neurogenesis” Poster, Motor Day, Northwestern University Feinberg School of Medicine
- Apr 2006 “An 18 year-old male presents to the emergency room with persistent headache, nausea, tinnitus, dizziness, and insomnia following a fall with minor head injury six days ago.” MSTP Grand Rounds
- Oct 2004 “Pax-3 in Xenopus neural crest development” Seminar, Northwestern University MSTP Retreat
- Sep 2004 “Pax-3 and Pax-7 in Xenopus neural crest development” Poster Session, Northwestern University Integrated Biological Sciences Graduate Program Retreat
- Aug 2003 “Pax-3 and Pax-7 in Xenopus neural crest development” Poster Session, Northwestern University MSTP Retreat
- Oct 2002 “Pax-3 and Pax-7 in Xenopus neural crest development” Seminar, Northwestern University Integrated Biological Sciences Student Organization

Meetings

- Nov 2015 Association for Molecular Pathology Annual Meeting, Austin, TX
- Mar 2015 United States and Canadian Academy of Pathology Annual Meeting, Boston, MA
- Nov 2014 Association for Molecular Pathology Annual Meeting, Washington, D.C.
- Sep 2014 College of American Pathologists Annual Meeting, Chicago, IL
- Aug 2014 Michael N. Hart Research Day, University of Wisconsin Hospital and Clinics, Madison, WI
- Mar 2014 United States and Canadian Academy of Pathology Annual Meeting, San Diego, CA
- Nov 2013 Association for Molecular Pathology Annual Meeting, Phoenix, AZ

- Sep 2013 Training Residents in Genomics, Genomic Pathology Workshop, American Society of Clinical Pathology Annual Meeting, Chicago, IL
- Sep 2013 American Society of Clinical Pathology Annual Meeting, Chicago, IL
- Aug 2013 Michael N. Hart Research Day, University of Wisconsin Hospital and Clinics, Madison, WI
- Mar 2013 United States and Canadian Academy of Pathology Annual Meeting, Baltimore, MD
- Aug 2012 Michael N. Hart Research Day, University of Wisconsin Hospital and Clinics, Madison, WI
- Mar 2012 United States and Canadian Academy of Pathology Annual Meeting, Vancouver, British Columbia, Canada
- Oct 2009 Society for Neuroscience Annual Meeting, Chicago IL
- Feb 2009 American Association for the Advancement of Science Meeting, Chicago IL
- Nov 2007 Society for Neuroscience Annual Meeting, San Diego CA
- Oct 2005 University of Chicago Symposium, Developmental Basis of Evolutionary Change, Chicago IL
- Oct 2003 University of Chicago Symposium, Developmental Basis of Evolutionary Change, Chicago IL
- May 2003 Northwestern University, Signal Transduction Symposium, Chicago, IL
- Jun 2003 Stowers Institute for Medical Research, Midwest Regional Developmental Biology Conference and Singer Symposium, Kansas City, MO
- Oct 2001 University of Chicago Symposium, Developmental Basis of Evolutionary Change, Chicago IL

Societies and Memberships

Diplomate in Anatomic and Clinical Pathology, American Board of Pathology (15-401)
Missouri State Medical License (2015014085)
Wisconsin State Medical License (60264-20)

American Association for the Advancement of Science
American Medical Association
American Society for Clinical Pathology
American Society of Human Genetics
Association for Molecular Pathology
College of American Pathologists
Digital Pathology Association
Endocrine Society
United States and Canadian Academy of Pathology
Wagih Bari Society of St. Louis Pathologists

Teaching

- 2014 Wisconsin Center for Academically Talented Youth (WCATY), Human Body and Disease Course
- 2013-2014 Angevine Fellow (medical student) Lecture Series
- 2013-2014 Instructor, School of Cytotechnology, Wisconsin State Laboratory of Hygiene
- 2012-2014 Pathology 600 graduate course
- 2012-2014 Foundations of Medicine Instructor, University of Wisconsin School of Medicine and Public Health
- 2007-2009 Supervisor to Jennifer Ray, undergraduate research assistant in the laboratory of Dr. Jaime García-Añoveros
- 2004 Teaching Assistant, Biochemistry. Dr. Andreas Matouschek and Dr. Neil Welker, Course Directors
- 1998-2000 Instructor and Curriculum Development, The Berkeley Review MCAT Preparation Course
- 1998 Instructor and Course Design, English 198, University of California at Berkeley. Dr. Stephen Booth, Course Sponsor

Hobbies, Activities, and Interests

- Ongoing Writing (fiction, short non-fiction); comedy; competitive trivia
- 2005-2007 Improvisational acting and comedy training, Second City and improvOlympic, Chicago, IL
- 2000-2003 Writer, director, and performer of “In Vivo” Northwestern University School of Medicine’s annual variety show, donating proceeds to local charities
- 2000-2002 Performed with and directed “The Best Medicine,” Northwestern University School of Medicine’s improvisational comedy troupe
- 1994-1999 Writer, *The Heuristic Squelch*, University of California at Berkeley humor magazine

Published Abstracts

Rosenbaum, JN, Chaudhri, AA, Baus, RM, Lloyd, RV, Buehler, DA, Expression of the Neuroepithelial Marker INSM1 in Ewing Sarcoma and Other Small Round Cell Sarcomas. *Modern Pathology*, 28 (S2) p.24A. USCAP Annual Meeting, 2015; March 21-27, 2015; Boston, MA. Nature Publishing Group.

Rosenbaum, JN, Yang, R, Baus, RM, Rehrauer, WM, Huang, W, Lloyd, RV, INSM1 Expression Correlates With Metastasis and Functional Hormone Production in Neuroendocrine Neoplasms. *Modern Pathology*, 28 (S2) p.140A. USCAP Annual Meeting, 2015; March 21-27, 2015; Boston, MA. Nature Publishing Group.

Rush, PS, **Rosenbaum, JN**, Baus, RM, Bennett, DD, Lloyd, RV, INSM1: A Novel Nuclear Marker in Merkel Cell Carcinoma (Cutaneous Neuroendocrine Carcinoma). *Modern Pathology*, 28 (S2) p.125A. USCAP Annual Meeting, 2015; March 21-27, 2015; Boston, MA. Nature Publishing Group.

Rosenbaum, JN, Accola, MA, Pavelec, DM, Laffin, JJ, Johnson, KA, Hasenstein, J, Kozak, KR, Rehrauer, WM, Buehler, D. Whole Exome Sequencing of Angiosarcoma Identifies Novel Variants. *Journal of Molecular Diagnostics*. Association for Molecular Pathology 2014 Annual Meeting; November 2014; Washington, DC. Elsevier; 2014. p.753.

Butt, YM, **Rosenbaum, JN**, Johnson, KA, Batra, K., Kanne, JP., Torrealba, JR. Pleuroparenchymal Fibroelastosis: A Report of the First 2 Cases Diagnosed at Autopsy. *Archives of Pathology and Laboratory Medicine*. College of American Pathologists 2014 Annual Meeting; September 6-11; Chicago, IL. p.e44.

Rosenbaum, JN, Baus, RM, Werner, HS, Rehrauer, WM, Lloyd, RV. INSM1: A Novel Immunohistochemical Marker for Neuroendocrine and Neuroepithelial Neoplasms. *Modern Pathology*. USCAP Annual Meeting, 2014; March 1-7, 2014; San Diego, CA. Nature; 2014. p.158A.

Rosenbaum, JN, Who, What, Where, Wiki: Social Media and Crowd Sourcing Effectively Disseminate and Preserve Resident Community Knowledge. *American Journal of Clinical Pathology*. American Society for Clinical Pathology; September 18-21, 2013; Chicago, IL. 2013. p.A210.

Rosenbaum, JN, Baus, RM, Werner, HS, Rehrauer, WM, Lloyd, RV. The Neuroendocrine Developmental Transcription Factor INSM1 is Overexpressed in Gastrointestinal Neuroendocrine Tumors. *Journal of Molecular Diagnostics*. Association for Molecular Pathology 2013 Annual Meeting; November 14-16; Phoenix, AZ. Elsevier; 2013. p.906.

Rosenbaum, J, Huang, W, Significantly Lower Expression Levels of Androgen Receptor (AR) Are Associated with Erythroblastosis Virus E26 Oncogene Related Gene (ERG) Negative (-) Prostate Cancer (PCa). #971. United States and Canadian Academy of Pathology's 101st Annual Meeting; March 17-23, 2012; Vancouver, BC, Canada. 2012.

Rosenbaum, JN, Duggan, A, Madathany, T, DeCastro, SCP, Gerelli, D, Garcia-Anoveros, JG; "Transient expression from late progenitor to neuron of the conserved zinc finger gene INSM1 during embryonic and adult neurogenesis." Program No. 816.16/B10. *Neuroscience 2007 Abstracts*. San Diego, CA: Society for Neuroscience, 2007. Online.

Bibliography

J. Rosenbaum, Z. Guo, R. Baus, H. Werner, W. Rehrauer, R. Lloyd. (2015) INSM1: a Novel Immunohistochemical and Molecular Marker for Neuroendocrine and Neuroepithelial Neoplasms. *American Journal of Clinical Pathology*, Oct;144

R. Lloyd, **J. Rosenbaum**, L. Erickson (2015). Immunohistochemical Approach to the Diagnosis and Prognostic Evaluation of Pancreatic Neuroendocrine Neoplasms. *Pancreatic Neuroendocrine Neoplasms: Practical Approach to Diagnosis, Classification, and Therapy*, S. La Rosa, F. Sessa (eds.). DOI 10.1007/978-3-319-17235-4_7

J. Rosenbaum, Y. Butt, K. Johnson, K. Meyer, K. Batra, J. Kanne, J. Torrealba. (2015) Pleuroparenchymal Fibroelastosis: a Pattern of Chronic Lung Injury. *Human Pathology*, Jan;46(1):137-46. PMID: 25454481

J. Rosenbaum, R. Lloyd. (2014) Pancreatic Neuroendocrine Neoplasms (Pan-NEN). *Clinics Review Articles: Surgical Pathology Clinics*. (7) 559–575. Available at: <http://dx.doi.org/10.1016/j.path.2014.08.005>

J. Rosenbaum, S. Drew, W. Huang. (2014) Significantly Higher Expression Levels of Androgen Receptor Are Associated With Erythroblastosis Virus E26 Oncogene Related Gene Positive Prostate Cancer. *American Journal of Clinical and Experimental Urology* 2(3):249-257. PMID: 25374927

J. Rosenbaum, A. Duggan, and J. García-Añoveros. (2011) Insm1 promotes the transition of olfactory progenitors from apical and proliferative to basal, terminal and neuronogenic. *Journal of Neuroscience Neural Development*, February 1;6:6. PMID: 21284846

J. Rosenbaum and K. Padian. (2000) New material of the basal Thyreophoran *Scutellosaurus lawleri* from the Kayenta Formation (Lower Jurassic) of Arizona. *Paleobios* 20(1):13-23