University of California, San Francisco

CURRICULUM VITAE

Name: Sarah E Umetsu

Position: Assistant Professor of Clinical Pathology
Pathology
School of Medicine

EDUCATION

1999 - 2003	Stanford University, Stanford, CA	B.S.	Biology, with honors	
2004 - 2012	Northwestern University Feinberg School of Medicine, Chicago, IL	M.D.		
2006 - 2010	Northwestern University, Chicago, IL	Ph.D.	Department of Microbiology-Immunology	Susan Winandy, Ph.D
2012 - 2014	University of California, San Francisco, CA	Resident	Pathology	
2014 - 2015	University of California, San Francisco, CA	Fellow	Gastrointestinal/Liver and Surgical Pathology	

LICENSES, CERTIFICATION

2014	Medical licensure, California
2015	Board Certification, American Board of Pathology, Anatomic Pathology

PRINCIPAL POSITIONS HELD

2015 - 2017	University of California San Francisco, San Francisco, CA	Clinical Instructor	Anatomic Pathology
2017 - present	University of California San Francisco, San Francisco	Assistant Professor	Anatomic Pathology

HONORS AND AWARDS

2002	Major Grant Recipient for Undergraduate Research, Howard Hughes Medical Institute
2003	Firestone Medal for Excellence in Undergraduate Research, Stanford University

2005	Federation of Clinical Immunological Societies, Travel Award Recipient and Selected Speaker
2007	Ruth L. Kirschstein National Research Service Award Training Grant
2007	The Graduate School Conference Travel Grant, Northwestern University
2015	Resident Teaching Award, Department of Pathology, University of California, San Francisco
2017	Faculty Teaching Award, Department of Pathology, University of California, San Francisco
2018	Hans Popper Hepatopathology Society, Best Trainee Abstract Award (to Trainee under my mentorship)

KEYWORDS/AREAS OF INTEREST

Pancreatobiliary pathology, gastrointestinal pathology, cancer genomics

CLINICAL ACTIVITIES

CLINICAL ACTIVITIES SUMMARY

My primary clinical focus is in the division of gastrointestinal/hepatobiliary pathology. As an attending surgical pathologist I review, diagnose, and report on surgical pathology specimens from patients operated on at the UCSF hospitals in the subspecialities of gastrointestinal, liver and pancreas pathology. I also participate and present in the Pancreatic Oncology Multidisciplinary Tumor Board, Colorectal Oncology Multidisciplinary Tumor Board, Neuroendocrine Oncology Multidisciplinary Tumor Board.

In addition, as a molecular pathologist and member of the UCSF Clinical Cancer Genomics Laboratory (CCGL). I provide diagnostic genetic molecular pathology services for tumors profiled with a targeted next generation DNA sequencing panel of cancer genes (UCSF500 cancer gene panel). My expertise includes the genomics of gastrointestinal and hepatobiliary cancer, in addition to a wide variety of other tumor types. I attend and present at weekly multidisciplinary Molecular Tumor Board meetings, at which genomics findings are discussed and integrated into a treatment plan.

CLINICAL SERVICES

2015 - present	USCF, Anatomic Pathology, Gastrointestinal Pathology Attending
2018 - present	UCSF, Clinical Cancer Genomics Laboratory, Molecular Pathologist

PROFESSIONAL ACTIVITIES

MEMBERSHIPS

2015 - present United States and Canadian Academy of Pathology

2015 - present South Bay Pathology Society

2018 - present Rodger C. Haggitt Gastrointestinal Pathology Society

2018 - present Hans Popper Hepatopathology Society

2018 - present Pancreatobiliary Pathology Society

SERVICE TO PROFESSIONAL PUBLICATIONS

2017 - present Ad hoc reviewer, Histopathology (1 paper)

2018 - present Ad hoc reviewer, Digestive Diseases and Sciences (1 paper)

2019 - present Ad hoc reviewer, Virchow Archives (2 papers in past year)

2020 - present Ad hoc reviewer, American Journal of Clinical Pathology (1 paper in past year)

INVITED PRESENTATIONS - INTERNATIONAL

2017	Koc University School of Medicine Surgical Pathology Workshop, Istanbul Turkey	Invited Speaker

INVITED PRESENTATIONS - NATIONAL

2019	Annual Meeting of United States and Canadian Academy of Pathology, Interactive Microscopy Session	Invited presenter
2020	Annual Meeting of United States and Canadian Academy of Pathology, Interactive Microscopy Session	Invited presenter
2020	Annual Meeting of United States and Canadian Academy of Pathology, Liver evening session	Invited presenter

INVITED PRESENTATIONS - REGIONAL AND OTHER INVITED PRESENTATIONS

2018	UCSF Pathology Department Annual CME Course, Current Issues in Anatomic Pathology, San Francisco, CA	Invited presenter
2018	UCSF Radiation-Oncology Department Annual CME Course, Radiation Oncology Updates, San Francisco, CA	Invited Speaker
2019	UCSF Pathology Department Annual CME Course, Current Issues in Anatomic Pathology, San Francisco, CA	Invited Speaker
2019	California Society of Pathologists, Annual Meeting, San Francisco, CA	Invited Speaker

UNIVERSITY AND PUBLIC SERVICE

DEPARTMENTAL SERVICE

2015 - present	Department of Pathology - Quality Improvement/Quality Assurance Committee	Member
2017 - 2018	Department of Pathology, Clinical Competency Committee	Member
2018 - present	Department of Pathology, Clinical Competency Committee	Chair
2018 - present	Department of Pathology, Immunohistochemistry Lab	Associate Director
2018 - present	Department of Pathology CME Annual Course Planning Committee	Member
2018 - 2019	Department of Pathology, Faculty Search Committee, Physician Scientist Search (1 faculty member)	Member
2018 - present	Department of Pathology, Residency Program - Applicant Selection/Rank List Committee	Member
2018 - present	Digital Pathology Working Group	Member
2019 - present	Department of Pathology, Surgical Pathology Fellowship	Director

COMMUNITY AND PUBLIC SERVICE

2019 - present	American Society for Clinical Pathology - Telepathology Global Health Initiative (1-2 cases/month)	Volunteer Consult Pathologist
2019 - present	Accreditation Council for Graduate Medical Education - Pathology Milestones 2.0 Quality Assurance Project	Participant

TEACHING AND MENTORING

FORMAL TEACHING

	Academic Yr	Course No. & Title	Teaching Contribution	School	Class Size
	2015 - present	Fellow Teaching Conference - 4 sessions/ year	Slide session	Medicine	10
	2015 - 2016	Mechanisms, Methods and Malignancies, Colon Cancer GAP Lab	Lab supervisor	Medicine	30

	Academic Yr	Course No. & Title	Teaching Contribution	School	Class Size
	2015 - 2016	Mechanisms, Methods and Malignancies; Classification of Neoplasms Small Group	Group Leader	Medicine	12
	2016 - 2017	Ground School Element of the Foundations 1 Course IDS121A	Group leader	Medicine	14
	2017 - present	Resident Teaching Conference - 5 lectures/year	Lecturer and unknown slide session	Medicine	20

INFORMAL TEACHING

2016 - present Organizer of weekly unknown email based Surgical Cases of the Week (SCOWs) for UCSF residents and fellows.

RESEARCH AND CREATIVE ACTIVITIES

RESEARCH AND CREATIVE ACTIVITIES SUMMARY

My recent work as a clinical and molecular pathologist has driven me to focus on using genomics to aid in classification and characterization of cancer. I have led projects utilizing next generation sequencing platforms to identify novel mutations in vascular tumors (Bean GR, Histopathology. 2018; Bean GR, Mod Path. 2017), and participated in projects to improve diagnostic classifications of hepatocellular neoplasms (Joseph NM, Mod Pathol. 2019; Joseph NM, J Pathol. 2019).

As a clinical pathologist with experience in basic science research, one of my goals is to create a bridge between clinical pathology and more basic research. Through collaborations at both the local and national level, I have also made important research contributions as a pathologist to larger NIH-funded research studies. For these studies I advise in the pathologic examination of tissue from animal models and coordinate specimen collection for human studies, as well as analyzing the histology (Jiang H, J Clin Invest. 2020; Shi Y, Nature. 2019; Yu S, J Allergy Clin Immunol. 2019).

In addition, I am involved as a pathologist in a number of clinical trials at UCSF. I am currently the lead pathologist on a Phase II study on cancers of all sites with ARID1A deficiencies. My role in this project involves advising and review of samples from every patient undergoing consideration for enrollment in the clinical trial and coordinating testing of the samples.

RESEARCH AWARDS - CURRENT

1. 1R43AG066230 Pathologist 5 % effort Suh (PI)
   National Institute of Health, National Institute on Aging 05/15/2020 10/31/2020

A laparoscopic grasping instrument for robust and atraumatic tissue manipulation in minimally-invasive gastrointestinal surgery	$ 224,952 direct/yr 1	$ 224,952 total

The goal of this project is to test a novel surgical grasper which is designed to decrease tissue trama.

I am the lead pathologist on this project and am responsible for all advising on pathology matters, coordinating specimen handling, and reviewing histology slides.

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2. PI/Pathologist — Umetsu (PI)

UCSF Department of Pathology — 7/1/2019 — 7/1/2021

Histologic Classification and Molecular Characterization of Low-Grade Mucinous Neoplasms Arising in the Appendix and in Ovarian Mature Teratomas — $ 10,000 total

The goal of this project is to characterize the molecular landscape of teratoma-associated low-grade mucinous neoplasms and correlate with alterations of those arising in the appendix.

I am the lead pathologist on this project and am responsible for designing the experiments, performing the data analysis, and analyzing the results.

RESEARCH AWARDS - PAST

1. F30 ES015971 — PI — 100 % effort — Umetsu (PI)

   National Institutes of Health, NIEHS Ruth L. Kirschstein National Research Service Award Training Grant — 9/1/07 — 8/31/12

   The Role of Ikaros in Regulatory T cells the Protect Against Allergic Asthma — $ 30000 direct/yr 1 — $ 180,000 total

   The goal of this project was to study the role of the transcription factor Ikaros in the development of Treg cells that protect against allergic asthma

   I was the lead graduate student on this project, I designed and carried out the experiments, performed data analysis, and wrote up the results.

PEER REVIEWED PUBLICATIONS

1. McIntire JJ, **Umetsu SE**, Akbari O, Potter M, Barsh GS, Freeman GJ, Umetsu DT, DeKruyff RH. 2001. Identification of Tapr (an airway hyperreactivity regulatory locus) and the linked Tim gene family. Nature Immunology. 2(12):1109-16. PMID 11725301.
2. McIntire JJ, **Umetsu SE**, Macaubas C, Hoyte EG, Cinoioglu C, Cavalli-Sforza LL, Barsh GS, Hallmayer JF, Underhill PA, Risch NJ, Freeman GJ, DeKruyff RH, Umetsu DT. 2003. Immunology: Hepatitis A virus link to atopic disease. Nature. 425(6958):576. PMID 14534576.
3. Meyers JH, Chakravarti S, Schlesinger D, Illes Z, Waldner H, **Umetsu SE**, Kenny J, Zheng XX, Umetsu DT, DeKruyff RH, Strom TB, Kuchroo VK. 2005. TIM-4 is the ligand for TIM-1 and their interaction regulates T cell proliferation. Nature Immunology. 6(5):447-54. PMID 15793576.
4. **Umetsu SE**, Lee WL, McIntire JJ, Downey L, Sanjanwala B, Akbari O, Berry, GJ, Nagumo H, Freeman GJ, Umetsu DT, DeKruyff RH. 2005. TIM-1 induces T cell activation and inhibits the development of peripheral tolerance. Nature Immunology. 6(5): 447-54. PMID 15793575.
5. Tami C, Silberstein E, Manangeeswaran M, Freeman GJ, **Umetsu SE**, DeKruyff RH, Umetsu DT, Kaplan GG. 2007. IgA is a natural ligand of the hepatitis A virus cellular receptor 1 (HAVCR1), and the association of IgA with HAVCR1 enhances virus-receptor interactions. J Virology. 81 (7):3437-46. PMID 17229699.
6. Thomas RM, Chunder N, Chen C, **Umetsu SE**, Winandy S, Wells AD. 2007. Ikaros enforces the costimulatory requirement for IL2 gene expression and is required for anergy induction in CD4+ T lymphocytes. J. Immunol. 179(11):7305-7315. PMID 18025173.

7. Kobayashi N, Dorfman DM, Pena-Cruz V, Jinushi M, Chernova I, **Umetsu SE**, Nagumo H, Dranoff G, Zhu B, Kaplan GG, Casasnovas JM, Umetsu DT, DeKruyff RH, Freeeman GJ. 2007. TIM-1 and TIM-4 glycoproteins bind phosphatidylserine and mediate uptake of apoptotic cells. Immunity. 27(6):927-40. PMID 18082433.

8. Quirion MR, Gregory GD, **Umetsu SE**, Winandy S, Brown MA. 2009. Cutting edge: Ikaros is a regulator of Th2 cell differentiation. J Immunol. 182(2):741-5. PMID 19124715

9. **Umetsu SE**, Winandy S. 2009. Ikaros regulates Il10 expression in CD4+ T cells. J. Immunol. 183(9):5518-2. PMID 19828627.

10. Chari S, **Umetsu SE**, Winandy S. 2010. Notch target gene deregulation and maintenance of the leukemogenic phenotype do not require RBP-Jk in Ikaros null mice. J Immunol. 185(1):410-7.

11. Lee HH, Meyer EH, Goya S, Pichavant M, Kim HY, Bu X, **Umetsu SE**, Jones JC, Savage PB, Iwakura Y, Casasnovas JM, Kaplan G, Freeman GJ, DeKruyff RH, Umetsu DT. Apoptotic cells activate NKT cells through T cell Ig-like mucin-like-1 resulting in airway hyperreactivity. J Immunol. 2010 Nov 1;185(9):5225-35. PMID 20889552.

12. Albacker LA, Karisola P, Chang YJ, **Umetsu SE**, Zhou M, Akbari O, Kobayashi N, Baumgarth N, Freeman GJ, Umetsu DT, DeKruyff RH. TIM-4, a receptor for phosphatidylserine, controls adaptive immunity by regulating the removal of antigen-specific T cells. J Immunol. 2010 Dec 1;185(11):6839-49. PMID 21037090.

13. Albacker LA, Yu S, Bedoret D, Lee WL, **Umetsu SE**, Monahan S, Freeman GJ, Umetsu DT, DeKruyff RH. TIM-4, expressed by medullary macrophages, regulates respiratory tolerance by mediating phagocytosis of antigen-specific T cells. Mucosal Immunol. 2013 May;6(3):580-90.

14. Ehman EC, Behr SC, **Umetsu SE**, Fidelman N, Yeh BM, Ferrell LD, Hope TA. Rate of observation and inter-observer agreement for LI-RADS major features at CT and MRI in 184 pathology proven hepatocellular carcinomas. Abdom Radiol (NY). 2016 May; 41(5):963-9. PMID: 27193793

15. Ehman EC, **Umetsu SE**, Ohliger MA, Fidelman N, Ferrell LD, Yeh BM, Yee J, Hope TA. 2016 Imaging prediction of residual hepatocellular carcinoma after locoregional therapy in patients undergoing liver transplantation or partial hepatectomy. Abdom Radiol (NY). Published online Aug 3 2016. PMID: 27484789.

16. Bean GR, Joseph NM, Gill RM, Folpe AL, Horvai AE, **Umetsu SE**. 2017 Recurrent GNAQ mutations in anastomosing hemangiomas. Mod Path. May;30(5):722-727.

17. **Umetsu SE**, Shafizadeh N, Kakar S. Grading and staging mucinous neoplasms of the appendix: a case series and review of the literature. Hum Pathol. 2017 11; 69:81-89. PMID: 28970138

18. Wang S, Woodard, GA, **Umetsu SE**, Tsai KK, Daud AI, Jones KD, Jablons DM. Melanotic Schwannoma: A challenging Diagnosis Made Clear Through Genetic Testing. AJSP: Rev and Rep. 2017 Vol 22 (3) 161-163. doi: 10.1097

19. Agnihotri P, Robertson NM, **Umetsu SE**, Arakcheeva K, Winandy S. Lack of Ikaros cripples expression of Foxo1 and its targets in naive T cells. Immunology. 2017 Jul 3. doi: 10.1111/imm.12786.

20. Kidambi TD, Goldberg D, Nussbaum R, Blanco A, **Umetsu SE**, Terdiman JP, Lee JK. Novel variant of unknown significance in MUTYH in a patient with MUTYH-associated polyposis: a case to reclassify. Clin J Gastroenterol. 2018 May 15. PMID: 29766397

21. Shamir ER, Devine WP, Pekmezci M, **Umetsu SE**, Krings G, Federman S, Cho SJ, Saunders TA, Jen KY, Bergsland E, Jones K, Kim GE, Kakar S, Chiu CY, Joseph NM. Identification of high-risk human papillomavirus and Rb/E2F pathway genomic alterations in mutually exclusive subsets of colorectal neuroendocrine carcinoma. Mod Pathol. 2018 Sep 20. PMID: 30237525

22. Villanueva-Meyer JE, Magill ST, Lee JC, **Umetsu SE**, Flavell RR. Detection of Metastatic Meningioma to the Liver Using 68Ga-DOTA-Octreotate PET/CT. Clin Nucl Med. 2018 Jun 22. PMID: 29939957

23. 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 Mar 02. PMID: 29505427

24. Joseph NM, Brunt EM, Marginean C, Nalbantoglu I, Snover DC, Thung SN, Yeh MM, **Umetsu SE**, Ferrell LD, Gill RM. Frequent GNAQ and GNA14 Mutations in Hepatic Small Vessel Neoplasm. Am J Surg Pathol. 2018 Jul 03. PMID: 29975248

25. Bean GR, Joseph NM, Folpe AL, Horvai AE, **Umetsu SE**. Recurrent GNA14 mutations in anastomosing hemangiomas. Histopathology. 2018 Mar 25. PMID: 29574926

26. Lim HC, Montesion M, Botton T, Collisson EA, **Umetsu SE**, Behr SC, Gordan JD, Stephens PJ, Kelley RK. Hybrid Capture-Based Tumor Sequencing and Copy Number Analysis to Confirm Origin of Metachronous Metastases in BRCA1-Mutant Cholangiocarcinoma Harboring a Novel YWHAZ-BRAF Fusion. Oncologist. 2018 Apr 05. PMID: 29622700

27. Perez PM, Flavell RR, Kelley RK, **Umetsu S**, Behr SC. Heterogeneous Uptake of 18F-FDG and 68Ga-PSMA-11 in Hepatocellular Carcinoma. Clin Nucl Med. 2019 Jan 04. PMID: 30624275

28. Merritt B, Behr S, **Umetsu SE**, Roberts J, Kolli KP. Anastomosing hemangioma of liver. J Radiol Case Rep. 2019 Jun; 13(6):32-39. PMID: 31558961. PMCID: PMC6742452

29. Wen KW, **Umetsu SE**, Goldblum JR, Gill RM, Kim GE, Joseph NM, Rabinovitch PS, Kakar S, Lauwers GY, Choi WT. DNA Flow Cytometric and Interobserver Study of Crypt Cell Atypia in Inflammatory Bowel Disease. Histopathology. 2019 Oct. PMID: 31111543

30. Xu Y, Poggio M, Jin HY, Shi Z, Forester CM, Wang Y, Stumpf CR, Xue L, Devericks E, So L, Nguyen HG, Griselin A, Gordan JD, **Umetsu SE**, Reich SH, Worland ST, Asthana S, Barna M, Webster KR, Cunningham JT, Ruggero D. Translation control of the immune checkpoint in cancer and its therapeutic targeting. Nat Med. 2019 Jan 14. PMID: 30643286

31. Joseph NM, **Umetsu SE**, Shafizadeh N, Ferrell L, Kakar S. Genomic profiling of well-differentiated hepatocellular neoplasms with diffuse glutamine synthetase staining reveals similar genetics across the adenoma to carcinoma spectrum. Mod Pathol. 2019 Jun 12. PMID: 31189995

32. Joseph NM, Tsokos CG, **Umetsu SE**, Shain AH, Kelley RK, Onodera C, Bowman S, Talevich E, Ferrell LD, Kakar S, Krings G. Genomic profiling of combined hepatocellular-

cholangiocarcinoma reveals similar genetics to hepatocellular carcinoma. J Pathol. 2019 Jan 28. PMID: 30690729

33. Piawah S, Hyland C, **Umetsu SE**, Esserman LJ, Rugo HS, Chien AJ. A case report of vanishing bile duct syndrome after exposure to pexidartinib (PLX3397) and paclitaxel. NPJ Breast Cancer. 2019; 5:17. PMID: 31240240. PMCID: PMC6570645

34. Yu S, Leung KM, Kim HY, **Umetsu SE**, Xiao Y, Albacker LA, Lee HJ, Umetsu DT, Freeman GJ, DeKruyff RH. Blockade of Repulsive guidance molecule b (RGMb) inhibits allergen-induced airways disease. J Allergy Clin Immunol. 2019 Jan 28. PMID: 30703386

35. Selvig D, Piceno Y, Terdiman J, Zydek M, **Umetsu SE**, Balitzer D, Fadrosh D, Lynch K, Lamere B, Leith T, Kassam Z, Beck K, Lewin S, Ma A, Somsouk M, Lynch SV, El-Nachef N. Fecal Microbiota Transplantation in Pouchitis: Clinical, Endoscopic, Histologic, and Microbiota Results from a Pilot Study. Dig Dis Sci. 2019 Jul 13. PMID: 31302808

36. Shi Y, Gao W, Lytle NK, Huang P, Yuan X, Dann AM, Ridinger-Saison M, DelGiorno KE, Antal CE, Liang G, Atkins AR, Erikson G, Sun H, Meisenhelder J, Terenziani E, Woo G, Fang L, Santisakultarm TP, Manor U, Xu R, Becerra CR, Borazanci E, Von Hoff DD, Grandgenett PM, Hollingsworth MA, Leblanc M, **Umetsu SE**, Collisson EA, Scadeng M, Lowy AM, Donahue TR, Reya T, Downes M, Evans RM, Wahl GM, Pawson T, Tian R, Hunter T. Targeting LIF-mediated paracrine interaction for pancreatic cancer therapy and monitoring. Nature. 2019 May;569(7754):131-135. doi: 10.1038/s41586-019-1130-6. Epub 2019 Apr 17. PMID: 30996350

37. Kramer SP, Bowman CJ, Wang ZJ, Sheahon KM, Nakakura EK, Cho SJ, **Umetsu SE**, Behr SC. Hybrid Low-Grade Fibromyxoid Sarcoma and Sclerosing Epithelioid Fibrosarcoma of the Pancreas. J Gastrointest Cancer. 2020 Feb 08. PMID: 32034641

38. Kouanda A, **Umetsu S**, Dai SC. Microforceps in the Diagnosis of Pancreatic Bronchogenic Cyst Under Endoscopic Ultrasound Guidance. ACG Case Rep J. 2020 Mar; 7(3):e00356. PMID: 32337317. PMCID: PMC7162121

39. Jiang H, Torphy RJ, Steiger K, Hongo H, Ritchie AJ, Kriegsmann M, Horst D, **Umetsu SE**, Joseph NM, McGregor K, Pishvaian MJ, Blais EM, Lu B, Li M, Hollingsworth M, Stashko C, Volmar K, Yeh JJ, Weaver VM, Wang ZJ, Tempero MA, Weichert W, Collisson EA. Pancreatic ductal adenocarcinoma progression is restrained by stromal matrix. J Clin Invest. 2020 Aug 4;136760.

REVIEW ARTICLES

1. **Umetsu SE**, Brown I, Langner C, Lauwers GY. Autoimmune enteropathies. Virchows Arch. 2018 Jan; 472(1):55-66. PMID: 29022145

2. Umetsu DT, **Umetsu SE**, Freeman GJ, DeKruyff RH. TIM gene family and their role in atopic diseases. Curr Top Microbiol Immunol. 2008; 321:201-15. PMID: 18727494

BOOKS AND CHAPTERS

1. **Umetsu SE**, Montgomery EA, Anastomosing hemangioma, WHO Classification of Tumours of Soft Tissue and Bone (5th ed.), IARC Press, Lyon, France (2020).

SIGNIFICANT PUBLICATIONS

1. Bean GR, Joseph NM, Gill RM, Folpe AL, Horvai AE, **Umetsu SE**. 2017 Recurrent GNAQ mutations in anastomosing hemangiomas. Mod Pathol. 2017 May;30(5):722-727.

   This paper is significant as it was the first to show anastomosing hemangiomas were distinct entities and were unrelated to angiosarcomas. The project was my idea, I was the senior author on the study, and it was published in one of the top 3 academic surgical pathology journals.

2. Bean GR, Joseph NM, Folpe AL, Horvai AE, **Umetsu SE**. Recurrent GNA14 mutations in anastomosing hemangiomas. Histopathology. 2018 Mar 25. PMID: 29574926

   This paper was a follow up study to our initial study. I was the senior author on the study and it was published in one of the top 10 academic surgical pathology journals.

3. 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 Mar 02. PMID: 29505427

   This paper is significant as it showed a novel use of a molecular technique to determine maternal versus fetal origin of tumor arising in association with pregnancy. The project was my idea, I was the senior author on the study and it was published in one of the top 3 academic surgical pathology journals.

4. **Umetsu SE**, Shafizadeh N, Kakar S. Grading and staging mucinous neoplasms of the appendix: a case series and review of the literature. Hum Pathol. 2017 11; 69:81-89. PMID: 28970138

   This paper is significant as it clarified the complex terminology of appendiceal tumors through correlation with outcome data. I was the first author on the study and it was published in one of the top 5 academic surgical pathology journals, and was highlighted as a paper to read by the Rodger C. Haggitt Gastrointestinal Pathology Society.

5. **Umetsu SE**, Montgomery EA, Anastomosing hemangioma, WHO Classification of Tumours of Soft Tissue and Bone (5th ed.), IARC Press, Lyon, France (2020).

   This book chapter is significant as the WHO books are internationally recognized resource.

CONFERENCE ABSTRACTS

1. **Umetsu SE**, Shafizadeh N, Kakar S. Mucinous Neoplasms of the Appendix: Challenges in Grading and Staging with Proposal for a New System. Mod Pathol. Vol 29 (Suppl 2): 363A, 2/2016. [2016 Annual Meeting of United States and Canadian Academy of Pathology]
2. Bean GR, Joseph NM, Gill RM, Folpe AL, Horvai AE, **Umetsu SE**. 2017 Recurrent GNAQ mutations in anastomosing hemangiomas. Mod Pathol. Vol 30. 2/2017. [2017 Annual Meeting of United States and Canadian Academy of Pathology]
3. Liu SY, Braun H, Roberts J, Ferrell L, **Umetsu SE**. Histopathology of Small-for-Size Syndrome after Living Donor Transplantation. Mod Pathol. Vol 31 (Suppl 2). 3/2018 [2018 Annual Meeting of United States and Canadian Academy of Pathology]

4. Shamir E, Devine WP, Jones K, Saunders T, **Umetsu S**, Cho SJ, Bergsland E, Kim G, Kakar S, Joseph N Genomic Profiling of Colorectal Neuroendocrine Carcinoma (NEC) Reveals Multiple Mechanisms of RB1 Inactivation. Mod Pathol. Vol 31 (Suppl 2).[2018 Annual Meeting of United States and Canadian Academy of Pathology]
5. Bowman CJ, Cohen J, Kakar S, **Umetsu SE**, Laszik GZ. Immunological and Cancer-related Genes Differentiate Between Hepatocellular Adenoma and Well-differentiated Hepatocellular Carcinoma. Mod Pathol. Vol 31(Suppl 2), 3/2018. [2018 Annual Meeting of United States and Canadian Academy of Pathology]
6. Anderson J, **Umetsu SE**, Pekmezci M, Kakar S, Wang L. Morphologic Features Predictive of Invasive Adenocarcinoma in Colonic Endoscopic Biopsies in the Absence of Definite Stromal Desmoplasia. Mod Pathol. Vol 31 (Suppl 2): 3/2018. [2018 Annual Meeting of United States and Canadian Academy of Pathology]
7. 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. Mod Pathol. Vol 31 (Suppl 2): 3/2018. [2018 Annual Meeting of United States and Canadian Academy of Pathology]
8. Wen KW, **Umetsu SE**, Goldblum JR, Gill RM, Kim GE, Joseph NM, Rabinovitch PS, Kakar S, Lauwers GY, Choi WT, DNA Flow Cytometric and Interobserver Study of "Crypt Cell Atypia" in Inflammatory Bowel Disease. Mod Pathol. [2019 Annual Meeting of United States and Canadian Academy of Pathology]
9. Therrien NM, Ladwig N, Devine WP, Bean G, Garg K, **Umetsu SE**. Aggressive Uterine Inflammatory Myofibroblastic Tumors Have Pathogenic Molecular Alterations in Addition to ALK Fusions. Mod Pathol. [2019 Annual Meeting of United States and Canadian Academy of Pathology]
10. Balitzer D, **Umetsu SE.** Evaluation of HCC in Setting of Direct-Acting Antiviral Therapy. Mod Pathol. [2019 Annual Meeting of United States and Canadian Academy of Pathology]
11. **Umetsu SE**, Joseph NM, Cho SJ, Jain D, Deshpande V, Kakar S. Focal Nodular Hyperplasia-like Nodules Arising in the Setting of Hepatic Chronic Vascular Disorders Show Beta-catenin Activation. Mod Pathol. [2019 Annual Meeting of United States and Canadian Academy of Pathology]
12. Ladwig N, Rabban JT, Stohr B, **Umetsu SE**, Garg K, Zaloudek C. Ovarian Germ Cell Tumors in Women >35 Years of Age are Genetically Distinct From Ovarian Germ Cell Tumors in Adolescents. Mod Pathol. [2019 Annual Meeting of United States and Canadian Academy of Pathology]
13. Jankowski T, **Umetsu SE,** Joseph N, Wolsky R, Ladwig N. The Combination of Aberrant p53 and Rb Immunohistochemistry is Highly Specific for Leiomyosarcoma. Mod Pathol. [2020 Annual Meeting of United States and Canadian Academy of Pathology]
14. **Umetsu SE,** Kakar S, Jones K, Bergsland E, Kim G, Joseph N. Molecular Profiling of Grade 3 Pancreatic Neuroendocrine Neoplasms (NEN) Reveals Frequent TP53 and CDKN2A Alterations in both NET and NEC. Mod Pathol. [2020 Annual Meeting of United States and Canadian Academy of Pathology]