College of Medicine
Prepared: 11/7/2023

DAVID J. SEWARD, M.D., Ph.D.
CURRICULUM VITAE

Position: **Assistant Professor**
Department of Pathology and Laboratory Medicine
Robert Larner, M.D. College of Medicine at The University of Vermont
Attending Pathologist
Department of Pathology and Laboratory Medicine
University of Vermont Medical Center

Address: Department of Pathology and Laboratory Medicine
Robert Larner M.D., College of Medicine at The University of Vermont
89 Beaumont Ave HSRF 206
Burlington, VT 05405
Voice: (802) 656-0390
Fax: (802) 656-8892
email: david.seward@med.uvm.edu
website: https://dseward.w3.uvm.edu

EDUCATION

2003-2005; 2010-2012	University of Colorado School of Medicine *Aurora, CO*	M.D.	
2005-2010	University of Colorado Graduate School, Program in Molecular Biology (David L. Bentley, Ph.D.) *Aurora, CO*	Ph.D.	Biochemistry and Molecular Genetics
1996-2000	Williams College *Williamstown, MA*	B.A.	Biology and Chemistry

POST-DOCTORAL TRAINING

2015-2016	University of Michigan Hospital *Ann Arbor, MI*	Fellow	Molecular and Genetic Pathology
2012-2015	University of Michigan Hospital *Ann Arbor, MI*	Resident	Anatomic Pathology

LICENSES, CERTIFICATION

2016-present	Medical Licensure, Vermont
2012-2017	Medical Licensure, Michigan
2016-present	Board Certification in Molecular and Genetic Pathology
2015-present	Board Certification in Anatomic Pathology

FACULTY POSITIONS HELD

2016-Present	Robert Larner M.D., College of Medicine at The University of Vermont *Burlington, VT*	Assistant Professor	Pathology and Laboratory Medicine

OTHER POSITIONS AND MAJOR ADMINISTRATIVE POSITIONS HELD – *None to date*

HONORS AND AWARDS

2000	Sigma Xi Honor Society for Demonstrated Excellence in Scientific Research at Williams College
2000	Molecular Biology and Biochemistry 1960's Scholar at Williams College
2000	Biology 1960's Scholar at Williams College
2006-2007	Pre-doctoral Trainee in Molecular Biology, NIH T32-GM08730
2007-2008	Pre-doctoral Trainee in Molecular Biology, NIH T32-GM08730
2009	Days of Molecular Medicine Travel Award Recipient
2018	Best Elevator Pitch Award (Faculty)
2020	The Inaugural Elmer R. Huber Early Career Green and Gold Professor in Pathology and Laboratory Medicine

KEYWORDS/AREAS OF INTEREST

Lung cancer (NSCLC), metabolism, immunotherapy, functional genomics, epigenetics, tumor heterogeneity, aging, tumor microenvironment

PROFESSIONAL ACTIVITIES- OVERALL SUMMARY

Scholarship/Research: During the past 12 months I have successfully competed for internal and extramural grant funding, most notably an NCI funded R21 (2nd % , Direct + Indirect = $429,000 over two years) and have published several manuscripts (four accepted, two in preparation). I expect this level of production to continue in 2023-24, expanding to additional R01-level extramural funding and additional manuscripts.

Teaching/Mentoring: I have established both formal and informal mentoring relationships with students across the academic spectrum, including accepting my first two dissertation students (Sean Lenahan and Gopika Nandagopal) from the CMB program. Of particular note, Sean Lenahan has recently been awarded a position on the VLC T32 training grant. I consider my mentoring efforts important accomplishments and look forward to fostering these connections.

Service: 25% of my effort is devoted to attending on the molecular pathology service within the department of pathology and laboratory medicine. My clinical work focuses on the interpretation of Next generation sequencing (NGS) data obtained in the evaluation of solid tumors. This analysis helps guide therapy, prognosis, and enrollment in clinical trials. In addition, I have served on two physician scientist working groups, multiple graduate thesis committees, overseen CMB qualifying exams, participated in the interview processes for a number of faculty, residents and graduate student candidates, and am a member of the CMB admissions committee.

SUMMARY OF ACCOMPLISHMENTS

I was hired in the Fall of 2016 by the Department of Pathology and Laboratory Medicine on the tenure track pathway with the intent to establish an independent research program while also attending on the Molecular Pathology service. Currently my job is proportioned as 75% research, 25% clinical. My clinical work focuses on the interpretation of Next Generation Sequencing (NGS) data obtained in the evaluation of solid tumors. This analysis helps guide therapy, prognosis, and enrollment in clinical trials. My research encompasses my clinical work, focusing on functional genomics, as well as a directed interest in understanding mechanisms governing STK11-dependent immunotherapy response in KRAS-driven lung adenocarcinomas. Currently my lab is funded by my start-up package, a series of intramural grants and a recently funded NCI R21. My focus continues to be attaining extramural funding, evidenced by three R01 equivalent applications under review at NCI and NIGMS (application submitted in February 2020 and subsequently resubmitted (A01) in November 2022) and being selected as a finalist for Breath of Hope Foundation funding (15 national finalists, 1 award for which I was not ultimately selected). I have published ten papers in the last two years (12 in the last three years) in peer reviewed journals. While many of these papers have been collaborative projects, three papers have been solely from our lab, with two additional manuscripts being prepared for submission this spring (2023). Further, we have now established a mouse model critical to our ongoing work and

used it to build new collaborations across departments, specifically with Dr. Jon Boyson and Dr. Ralph Budd, as well as Mike Toth. Notably, a second recent R21 submitted to the NCI in collaboration with the Toth lab received a 7th% and is expected to be funded beginning summer/fall 2023. Our initial studies using this mouse model are extremely exciting and we anticipate a flurry of publications and grant submission in the coming years. Finally, I've recently been selected as a Vermont Cancer Center Ambassador. Cancer Center Ambassadors dedicate 10-20 hours annually in support of the communications, community outreach, and philanthropy goals.

PROFESSIONAL SERVICE

DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE SERVICE

2018	First Annual Pathology and Laboratory Medicine Research Conference	Session Co-Chair

LARNER COLLEGE OF MEDICINE SERVICE – *None to date*

UNIVERSITY OF VERMONT CANCER CENTER

2017-Present	Cancer Center Member (Molecular Mechanisms)
2023-Present	Cancer Center Ambassador

UNIVERSITY OF VERMONT MEDICAL CENTER SERVICE

2017-Present	Physician Scientist Working Group	Member
2018-Present	Clinical Research Working Group	Member

UNIVERSITY OF VERMONT SERVICE

2016-Present	Lake Champlain Cancer Center Research Organization grant review committee	Grant reviewer
2016-Present	Cellular, Molecular, and Biomedical Sciences (CMB) admissions	Interviewer
2017-Present	Office of the Vice President for Research (OVPR) grant review committee	Grant reviewer
2017-Present	Faculty Research Awards Committee	Reviewer
2018-Present	CMB Awards Committee	Reviewer
2019-Present	CMB qualifying exam	Proctor
2019	Summer Health and Medicine Academy	Invited Panelist
20201-Present	CMB Admissions Committee	Member

GOVERNMENT SERVICE – *None to date*

SOCIETY MEMBERSHIPS

2020-Present	American Association for Cancer Research (ID# 1166258)
2017-Present	Vermont Cancer Center
2016-Present	Vermont Medical Society
2015-Present	A. James French Society of Pathologists
2015-Present	Michigan Society of Pathologists
2012-Present	Association for Molecular Pathology
2012-Present	College of American Pathologists
2012-Present	United States and Canadian Academy of Pathology
2012-Present	The University of Colorado Alumni Association
2010-Present	American Medical Association
2000-Present	Sigma Xi Research Society
2000-Present	Williams College Alumni Association

SERVICE TO PROFESSIONAL ORGANIZATIONS

2022-2023	NIH-TIR Study Section	Invited Reviewer
October 18-19, 2023	NCI Program Project (P01) review meeting	Invited Reviewer
October 16-17, 2023	NIH "Mechanisms of Cancer Therapeutics A" [MCTA] study section	Invited Reviewer

SERVICE TO PROFESSIONAL PUBLICATIONS

2017-2020	Journal of Cellular Biochemistry	Associate Editor
2020-Present	American Journal of Physiology-Lung Cellular and Molecular Physiology	Ad hoc Reviewer
2020-Present	Current Bioinformatics	Ad hoc Reviewer
2021-Present	Journal of Thoracic Disease	Ad hoc Reviewer
2023-Present	Frontiers in Oncology	Associate Editor
2023-Present	Cancer Immunology, Immunotherapy	Ad hoc Reviewer
2023-Present	BMC Medical Genomics	Ad hoc Reviewer

COMMUNITY SERVICE

2018-Present Basketball Coach, Charlotte Recreation Center, Charlotte, VT

SUMMARY OF SERVICE ACTIVITIES

25% of my effort is devoted to attending on the molecular pathology service within the department of pathology and laboratory medicine. My clinical work focuses on the interpretation of next generation sequencing (NGS) data obtained in the evaluation of solid tumors. This analysis helps guide therapy, prognosis, and enrollment in clinical trials. In addition, I have served on a number of internal grant review committees in the last 12 months, joined the physician scientist working group, clinical research working group, and participated in the interview processes for a number of faculty, residents and graduate student candidates. I have also formally joined the CMB Admission Committee as a member overseeing graduate school applicant acceptances and have been selected as a Vermont Cancer Center Ambassador.

TEACHING

FORMAL SCHEDULED CLASSES

		R|E	Hours	# Learners	Level
2017-present	Cancer Biology: Biochemistry 472A	R	2	~20	G
2019-present	BIOL 298	E	6hr/week	1	UG
2019-present	CP Didactics: Molecular Pathology	R	1	15	R
2020-present	PATH307_Molecular Pathology	R	3	5	G
2019-present	BHSC281 - Applied Molecular Bio	R	2	20	U/G

R|E: Required or elective. Hours: total educational time. Learners: Number of students. Level: UG (undergraduate), MS1-4 (Masters), PGY1-4 (Residemt), F (Fellows).

CURRICULUM DEVELOPMENT | OTHER COURSE INFORMATION – *None to date*

PREDOCTORAL STUDENTS SUPERVISED OR MENTORED

2015-2016	Sarah Bergholtz	The University of Michigan (Jr.)	Supervised research	Medical Student at the University of Michigan
2017	Abigail Keim	Endicott College	Career advice/mentor	Undergraduate at Endicott College
2016-2022	Evan Elko	University of Vermont (UVM) Cellular Molecular and Biomedical Sciences (CMB) graduate program	Thesis committee member, research advisor/collaborator	Post-doctoral position at Northern Arizona University (Ladner Lab)

2017-2020	Liam Donnelly M.D.	University of Vermont Medical Center (UVMMC)	Research advisor, career mentor	Pathology Resident | Fourth year | UVMMC
2018-2019	Abigail Finer	University of Vermont	Research advisor, career mentor	Genetic Counselor at Massachusetts General Hospital
2017-2018	Meagan Lebeau	UVM Medical Laboratory Science Master's Program	Research advisor, career mentor	Lab tech at UVM Genomic Medicine Lab
2017	Sarah Knickerbocker	Essex High School STEM student	Career mentor	Undergraduate Student
2018- 2019	Brett Gennero	UVM Medical Laboratory Science Master's Program	Research advisor, career mentor	Master's Student
2018-2019	Cai McCann	University of Vermont	Research advisor, career mentor	Research Associate at the Broad Institute
2018-2019	Kelly Xu	South Burlington H.S.	Research advisor, career mentor	Undergraduate at MIT
2018-2020	Trevor Wolf	UVM CMB graduate program	Thesis committee member	Graduate Student UVM CMB Program
2018-2019	Alqassem Aabuarqoub	UVM CMB graduate program	Rotation Advisor	Graduate Student UVM CMB Program
2019	Marcus Weinman	UVM CMB graduate program	Rotation Advisor	Graduate Student UVM CMB Program
2019-Present	Sean Lenahan	UVM CMB graduate program	Thesis advisor	Graduate Student UVM CMB Program
2019	Cong Gao	UVM CMB graduate program	Rotation Advisor	Graduate Student UVM CMB Program
2020-Present	Bay Vagher	UVM CMB graduate program	Rotation Advisor/ Thesis Committee Chair	Graduate Student UVM CMB Program
2020-Present	Gopika Nandagopal	UVM CMB graduate program	Co- Thesis advisor	Graduate Student UVM CMB Program
2020	Allison Morrissey	University of New Haven	Research advisor, career mentor	Graduate Student UVM CMB Program
2021-Present	Nathaniel Shannon	UVM CMB graduate program	Thesis Committee Member	Graduate Student UVM CMB Program
2021-Present	Olivia Ruggiero	University of Vermont	Undergraduate Thesis Advisor	Undergraduate at UVM, Honors College
2021-Present	Arjune Nibber	Robert Larner M.D., College of Medicine at The University of Vermont (LCOM at UVM)	Research Advisor	Medical Student LCOM at UVM

2022	Alyssa Hurley	UVM CMB graduate program	Rotation Advisor	Graduate Student UVM CMB Program
2022	William Dowell	UVM CMB graduate program	Rotation Advisor	Graduate Student UVM CMB Program
2022	Alexis Roberson	UVM CMB graduate program	Rotation Advisor	Graduate Student UVM CMB Program
2022	Israel Odekunle	UVM CMB graduate program	Rotation Advisor	Graduate Student UVM CMB Program
2023	Allison Racela	UVM CMB graduate program	Rotation Advisor	Graduate Student UVM CMB Program
2023	Jenna Eaton	Robert Larner M.D., College of Medicine at The University of Vermont (LCOM at UVM)	Research Mentor	Medical Student LCOM at UVM
2023	Ian Strohbehn	Robert Larner M.D., College of Medicine at The University of Vermont (LCOM at UVM)	Research Mentor	Medical Student LCOM at UVM

DISSERTATION/THESIS COMMITTEE MEMBERSHIP

2016-2021	Evan Elko	Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine	Mentor and collaborator to Evan, working on large dataset analyses. I also served as a member on his thesis committee	Post-doc at Northern Arizona University in the Pathogen and Microbiome Institute
2018-2020	Trevor Wolf	College of Nursing and Health Sciences at The University of Vermont	Thesis committee member	Graduate Student, Robert Larner M.D., College of Medicine at the University of Vermont | Neuroscience
2019-present	Sean Lenahan	Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine	Current graduate student in my laboratory and will complete his dissertation with me	Graduate Student, Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine
2020-present	Gopika Nandagopal	College of Nursing and Health Sciences at The University of Vermont and Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine	Co-mentor	Graduate Student, College of Nursing and Health Sciences at The University of Vermont and Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine
2021-present	Nathaniel Shannon	Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine	Thesis committee member	Graduate Student, Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine

2021-present	Bay Vagher	College of Nursing and Health Sciences at The University of Vermont	Thesis committee member	Graduate Student, College of Nursing and Health Sciences at The University of Vermont
2021	Alex D'Amico	College of Arts and Sciences at the University of Vermont	Chair of his thesis committee	
2021	Jenna Eaton	College of Arts and Sciences at the University of Vermont	Thesis committee member	Robert Larner M.D., College of Medicine at the University of Vermont
2021-present	Shannon Prior	College of Nursing and Health Sciences at The University of Vermont and Robert Larner M.D., College of Medicine at the University of Vermont	Thesis committee member	Graduate Student, College of Nursing and Health Sciences at The University of Vermont and Robert Larner M.D., College of Medicine at the University of Vermont
2021-present	Olivia Ruggiero	College of Arts and Sciences at the University of Vermont	Research Advisor and Member on thesis committee	Undergraduate at UVM, Honors College
2022-present	Katherine Horrigan	Robert Larner M.D., College of Medicine at the University of Vermont | Department of Surgery	Chair, Thesis committee	Graduate Student, Robert Larner M.D., College of Medicine at the University of Vermont | Department of Surgery
2023-present	Cameron Moquin	College of Arts and Sciences at the University of Vermont	Thesis committee member	Undergraduate at UVM, Honors College
2023-present	Victoria Gibson	Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine	Thesis committee member	Graduate Student, Robert Larner M.D., College of Medicine at the University of Vermont | Pathology and Laboratory Medicine

POSTDOCTORAL FELLOWS AND RESIDENTS DIRECTLY SUPERVISED OR MENTORED

2018-2022	Liam Donnelly, M.D.	University of Vermont Medical Center | Pathology and Laboratory Medicine	Research and career mentor	University of Vermont Medical Center | Pathology and Laboratory Medicine – Fourth Year Resident
2018-2020	Kara Landry, M.D.	University of Vermont Medical Center | Hematology and Oncology	Research mentor	University of Vermont Medical Center | Internal Medicine Resident

FACULTY MENTORED

Spring 2018	Paula Deming, Ph.D.	Research Collaborator	Dr. Deming applied to complete a sabbatical in my lab for the purpose of learning specialized research techniques, including use of Crispr-cas9 technologies	College of Nursing and Health Sciences Associate Dean for Research and Faculty Affairs

OTHER VISITING FACULTY SUPERVISED - *None to date*

INFORMAL TEACHING

2016-Present	**Pathology Resident teaching:** Techniques in Molecular Pathology (2 hours prep; 2 hours discussion); When my clinical service (25%) overlaps with a resident on the Molecular Pathology rotation, I present formal didactics focused on techniques used in Molecular Pathology.
2016-Present	**Fellow teaching:** Genomic Medicine Transdisciplinary Team Presentations (x3) (18 hr prep; 3 hr discussion). Our Molecular Pathology group presents interesting cases monthly at our Genomic Medicine TDT. I presented 4 cases/lectures in the last year, coordinating with oncology Fellows and discussing concepts prior to formal presentation.
2016-Present	Basics in R programming language for analysis of large RNA-seq datasets. This is not a formal course, rather tutoring/instruction for graduate students and colleagues who are interested in processing their own data. I spend time with all CMB graduate students rotating through my lab specifically to introduce bioinformatic skills.

TEACHING AIDS - *None to date*
TEACHING AWARDS AND NOMINATIONS - *None to date*

SUMMARY OF TEACHING ACTIVITIES
My current position does not include formal didactic teaching responsibilities and therefore many of the prior sections do not apply. That said, I have been active as a mentor across the student strata (high school students, undergrads, graduate students, medical students and residents), and consider this one of my major ongoing accomplishments.

RESEARCH AND SCHOLARLY TEACHING ACTIVITIES

RESEARCH AWARDS AND GRANTS
Ongoing Research Support

NCI R21 RCA283492A PI(s): Toth 7/01/2023-6/30/25
Development of a clinically relevant mouse model of lung cancer cachexia to study pathoetiology and therapeutic strategies

Role: Co-I (5%)	This project will establish a new genetically engineered mouse to better model cancer cachexia. Using our $KRAS^{G12D}$- versus $KRAS^{G12D}/STK11^{fl/fl}$ inducible lung cancer model we will assess weight loss over time and monitor the factors produced by the tumor. We aim to understand what drives cachexia with the intent of developing effective therapies to reduce associated morbitity.	$429,000

NCI R01CA273238 PI: Janssen-Heininger 04/01/2023-03/31/2028

Glutaredoxin, Glutathione Metabolism and Lung Cancer

Role: Co-I (5%)	The major goals of this project are to investigate the hypothesis that decreases in glutaredoxin expression in mutant KRAS-driven non-small cell lung cancer cause increases in system XC- activity through the S-glutathionylation of ovarian tumor deubiquitinase 1 (OTUB1), augmenting glutathione and promoting survival of lung cancer cells.	$3,205,941

NCI R21 1R21CA280266-01 PI(s): Seward 4/01/2023-3/31/25

STK11 loss of function and anti-PD-1 therapy resistance in KRAS-driven lung adenocarcinoma

Role: PI (25%)	This project builds on data generated from both in vitro and in vivo pilot work. We will immunophenotype cells from lungs of mice developing $KRAS^{G12D}$- versus $KRAS^{G12D}/STK11^{fl/fl}$-driven lung adenocarcinomas using flow cytometry. In parallel, we will collect tumor cells for transcriptome analysis by RNAseq. We aim to link anti-PD1-resistance in KRAS-driven lung adenocarcinomas with an STK11-loss-dependent transcriptional signature and subsequent tumor immune profile. We then aim to reverse that signature via manipulation of downstream regulatory networks.	$429,000

UVM Immuno Cobre Pilot Award	PI(s): Boyson/Seward	6/01/2022-5/31/23

Gamma delta T cells as sensors of tumor-intrinsic metabolic stress

Role: Co-PI	Lung cancer is a leading cause of worldwide cancer-related mortality. Recent clinical studies suggest that resistance to immunotherapy in a common type of lung cancer is associated with mutations in the STK11 gene that plays a critical role in regulating the metabolism of the tumor cell. Here, we will explore how loss of STK11 in tumor cells affects the recognition of tumor cells by unusual T cells called γδ T cells, and how STK11 loss affects the function of these anti-tumor T cells.	$50,000

Current Non-Funded Research – *None to date*

Completed Research Support

	PI(s): Seward	7/01/2021 – 6/30/22
University of Vermont Cancer Center Pilot Project		

Linking differential immune cell recruitment with STK11 loss using an inducible mouse model of lung adenocarcinoma

Role: PI	We will immunophenotype cells from lungs of mice developing $KRAS^{G12D}$- versus $KRAS^{G12D}/STK11^{fl/fl}$-driven lung adenocarcinomas using flow cytometry. In parallel, we will collect tumor cells for transcriptome analysis by RNAseq. We aim to link anti-PD1-resistance in KRAS-driven lung adenocarcinomas with an STK11-loss-dependent transcriptional signature and subsequent tumor immune profile.	$50,000

NNE-CTR TDI	PI(s): Seward and Boyson	February 2021 - Present

A spatial transcriptomics map of the tumor microenvironment in a model of lung adenocarcinoma

Role: Co-PI	This pilot project is a collaborative effort between the Seward and Boyson laboratories to test whether in the absence of STK11, YAP1 drives a transcriptional program marked by increases in tumor-intrinsic cytokine expression and secretion, including IL-6, IL-8 and IL-3 and to evaluate if cytokines then mediate IO- resistance by recruiting myeloid-derived suppressor cells, neutrophils and T-regulatory cells to the tumor microenvironment.	$15,000

Robert Larner M.D., College of Medicine at The University of Vermont Internal Grant Program	PI(s): Seward	April 2020 – March 2022

Investigating the Tumor-Intrinsic Mechanisms Linking STK11 Loss of Function and Anti-PD-1 Therapy Resistance in KRAS-driven Lung Adenocarcinoma

Role: PI	Each year lung cancer kills more people in the United States than breast, colorectal and prostate cancer combined. Advances in immunotherapy promise to reduce lung cancer mortality but we lack the tools to accurately predict which patients will benefit. The goal of my research is to delineate the molecular mechanisms linking STK11 loss with immunotherapy resistance in KRAS-driven non-small cell lung adenocarcinoma and exploit that knowledge to restore sensitivity to current therapies while also working to identify new treatment strategies.	$75,000

University of Vermont Department of Medicine Translational Research Pilot Program	PI(s): Bui	July 2018 – present

"Measurement of somatic mutation burden before and after field therapy for actinic keratoses"

Role: Co-investigator	Most cases of cutaneous squamous cell carcinoma (cSCC) develop due to excessive sun exposure. The effects of sun exposure are easily identifiable in the form of discoloration, wrinkles and precancerous AKs. When patients have multiple AKs physicians often prescribe what is called field therapy with the goal of reducing the patient's risk of developing cSCC. A variety of field therapeutic modalities exist, but head-to-head comparisons are lacking, and treatment recommendations vary widely. While standard of care, all field treatments are very difficult for patients to endure therefore it is vital to define how well each of these interventions work. Prior studies use clinical assessments of AKs as the primary outcome measure. We aim to directly quantify the DNA mutation burden within the skin.	$49,260

NIH T32-GM08730 2006-2007, 2007-2008
Pre-doctoral Trainee in Molecular Biology
Role: Trainee

University of Michigan Department of Anatomic Pathology – Internal Research Grant 2015-2016
Role: PI

Office of the Vice President of Research (OVPR) Dec 2016 – Nov 2017
"SIRT5 in osteosarcoma oncogenesis"
Role: PI
Modulation of aberrant mitochondrial metabolism as a novel approach to treat osteosarcoma via targeted disruption of the sirtuin SIRT5.
Amount Funded: $3,002.44

American Cancer Society Institutional Research Grant (ACS IRG) Salary: 1% July 2017 – December 2018
Amount Funded: $30,000
"Genomic organization of histone locus body (HLB), a histone gene regulatory domain in breast cancer"
Role: Co-PI
Fidelity of the temporal and spatial organization of gene regulatory machinery is required for control of cell proliferation. This study will define the functional roles of histone gene regulatory factors on organization of histone gene-associated subnuclear domains, as a novel architectural parameter of cancer progression. Findings will define critical nuclear structure-function relationships that impact understanding of cancer biology and pathology.

Lake Champlain Cancer Center Research Organization (LCCRO) Salary: 1% June 2017 – May 2018
Amount funded: $64,908
"RUNX2 Mediated Genetic and Epigenetic Control in Metastatic Melanoma"

Role: Co-investigator	Combing molecular, cellular, genetic and epigenetic approaches to characterize Runx2 control of melanoma- associated cell proliferation, contributions to acquisition of a metastatic phenotype, therapy resistance, and responsiveness to immune-modulation.

Lake Champlain Cancer Center Research Organization (LCCRO) — Salary: 1% — Amount funded: $65,000 — January 2018 – December 2020

"Active Surveillance with CT Imaging and Liquid Biopsies for Medically Inoperable Stage IA Lung Cancer in the Elderly"

Role: Co-investigator	Although patients with stage I lung cancer generally have poor outcomes even after treatment, some tumors tend to grow slowly or not at all. In elderly patients with serious medical problems, the lung cancer might never threaten the quality or quantity of their life. We aim to identify a population that could benefit from an active surveillance (AS) program, where patients only get treatment if a tumor displays aggressive behavior. To that end we propose to associate biomarkers [from blood and radiologic exams] with disease aggressiveness to pinpoint patients who may benefit from AS, ultimately sparing them the costs and toxicities associated with treatment.

Northern New England Clinical Oncology Society Research Grant — Amount funded: $25,000 — 3/01/2018 - 9/01/2019

"DNA repair landscape of discordant sibling pairs from hereditary breast cancer families"

Role: Co-investigator	Using a family-based design, the goal of this research is to identify novel gene variants associated with breast cancer risk and to define the functional significance of those variants by examining DNA sequence variation between sister pairs, with and without breast cancer, and their family members within high-risk breast cancer families.

CNHS Incentive Grant — Amount funded: $30,000 — June 2018 – July 2019

"Functional Characterization of Variants of Unknown Significance (VUS) in STK11 Identified by Clinical Next Generation Sequencing Assays in Non-Small Cell Lung Tumors"

Role: Co-PI	When interpreting pathology reports from clinical NGS samples, variants of unknown significance (VUS) are a major source of frustration for the clinical team and can cause significant stress and anxiety to the patient Thus, the ability to functionally characterize a given VUS quickly is an important step in enhancing the overall quality of patient care through precision medicine. This project focuses on proof of concept cases to develop techniques allowing functional assessment of VUS.

Pending Review

1. NCI-R01A1 resubmission (submitted March 2023, review scheduled 7/2023)
2. NCI Cancer Moonshot (R01) planned initial submission (6/2023)

Planned

1. NCI Cancer Moonshot resubmission Fall 2023 pending review
2. New NCI R01 pending NCI R01A1 resubmission; review dependent
3. I've been selected as a Project Leader for the new UVM COBRE application (VERSCI); planned submission is 1/2024.

Selected Unfunded Grant Submissions

- In 2017, following a competitive internal selection process, I was selected as the UVM applicant for the Mallinckrodt foundation grant. Unfortunately, the submission was not funded.
- In 2017 I participated in the internal selection of a COBRE application. Our proposal was ultimately not selected, but did receive the second highest score.
- 2018: Doris Duke Young Investigator funding application, but was not selected.
- 2019: Doris Duke Young Investigator funding application, but was not selected.
- In 2019, following a competitive internal selection process, I was again selected as the UVM applicant for the Mallinckrodt foundation grant. Unfortunately the submission was not funded.
- 2019 UVM Cancer center pilot project rejected focused on STK11-dependent immune cell recruitment to tumor microenvironment.
- In February 2020 I submitted a K08 application to the NCI. This was not discussed, and therefore not funded.
- In November 2020 I resubmitted a K08 application (A01) to the NCI. This again was not discussed. I will be submitting a new R21 in June 2022 based on this project.
- Spring 2021, DoD early career development award in Lung Cancer application not funded.
- Summer 2021, LUNGevity Foundation early career award application not funded.
- Winter 2022, NCI R01 initial submission; Scored in the 30th%, resubmitted Winter 2023.

SCHOLARSHIP

Peer Reviewed Publications

Original Research

1. Runnegar, M., **Seward, D.J.,** Ballatori, N., Crawford, J.M., and Boyer, J.L. (1999). Hepatic toxicity and persistence of ser/thr protein phosphatase inhibition by microcystin in the little skate *Raja erinacea*. Toxicology and applied pharmacology 161, 40-49. PMID: 10558922
2. Ballatori, N., Rebbeor, J.F., Connolly, G.C., **Seward, D.J.,** Lenth, B.E., Henson, J.H., Sundaram, P., and Boyer, J.L. (2000). Bile salt excretion in skate liver is mediated by a functional analog of Bsep/Spgp, the bile salt export pump. American journal of physiology 278, G57-63. PMID: 10644562
3. **Seward, D.J.,** Haney, J.C., Rudnicki, M.A., and Swoap, S.J. (2001). bHLH transcription factor MyoD affects myosin heavy chain expression pattern in a muscle-specific fashion. American journal of physiology 280, C408-413. PMID: 11208536
4. Wang, W., **Seward, D.J.,** Li, L., Boyer, J.L., and Ballatori, N. (2001). Expression cloning of two genes that together mediate organic solute and steroid transport in the liver of a marine vertebrate. Proceedings of the National Academy of Sciences of the United States of America 98, 9431-9436. PMID: 11470901
5. **Seward, D.J.,** Koh, A.S., Boyer, J.L., and Ballatori, N. (2003). Functional complementation between a novel mammalian polygenic transport complex and an evolutionarily ancient organic solute transporter, OSTalpha-OSTbeta. The Journal of biological chemistry 278, 27473-27482. PMID: 12719432
6. Elferink, R.P., Ottenhoff, R., Fricker, G., **Seward, D.J.,** Ballatori, N., and Boyer, J.L. (2004). Lack of biliary lipid excretion in the little skate, Raja erinacea, indicates the absence of functional Mdr2, Abcg5, and Abcg8 transporters. American journal of physiology 286, G762-768. PMID: 14701720
7. Ballatori, N., Henson, J.H., **Seward, D.J.**, Cai, S.Y., Runnegar, M., Fricker, G., Miller, D.S., and Boyer, J.L. (2006). Retention of structural and functional polarity in cultured skate hepatocytes undergoing in vitro morphogenesis. Comparative biochemistry and physiology 144, 167-179. PMID: 16567119
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20. Schiffers C, Lundblad LKA, Hristova M, Habibovic A, Dustin CM, Daphtary N, Aliyeva M, **Seward DJ**, Janssen-Heininger YMW, Wouters EFM, Reynaert NL, van der Vliet A. Downregulation of DUOX1 function contributes to aging-related impairment of innate airway injury responses and accelerated senile emphysema. Am J Physiol Lung Cell Mol Physiol. 2021 Jul 1;321(1):L144-

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23. Ghule PN, Boyd JR, Kabala F, Fritz AJ, Bouffard N, Gao C, Bright K, Macfarlane J, **Seward DJ**, Misteli T, Lian JB, Frietze S, Stein JL, Wijnen AJ, Stein GS. Spatiotemporal higher-order chromatin landscape of human histone gene clusters at Histone Locus Bodies during the cell cycle in breast cancer progression. Gene. 2023 (*Accepted*).
24. Aboushousha R, van der Velden J, Hamilton N, Peng Z, MacPherson M, Erickson C, White S, Wouters EFM, Reynaert NL, Seward DJ, Li J, Janssen-Heininger YMW. Glutaredoxin attenuates glutathione levels via deglutathionylation of Otub1 and subsequent destabilization of system x(C)(). Sci Adv. 2023 Sep 15;9(37):eadi5192. doi: 10.1126/sciadv.adi5192. Epub 2023 Sep 13. PubMed PMID: 37703360; PubMed Central PMCID: PMC10499329.
25. Lenahan, SM, Sarausky HM, Deming P, **Seward DJ**. STK11 loss leads to YAP1-mediated transcriptional activation in human KRAS-driven lung adenocarcinoma cell lines. Cancer Gene Therapy 2023. (Accepted)

Under Revision or Review

In Preparation

1. Sean M. Lenahan[1], Shannon Prior[2], Tyler C. Hogan[2], Gopika Nandagopal[2], Alyssa Hurley[1], Hailey M. Sarausky[1], Paula Deming[2,3], **David J. Seward[1,3]**. "GLUL transcriptional repression potentiates immune-checkpoint inhibitor resistance via disruption of a redox-based feedback loop involving STK11 and the asparagine/aspartate shuttle in KRAS-driven NSCLCs". (2023)
2. **paper #1 with Yvonne (Joe's work)

3. **paper with Mike Toth and Deena Snoke

Rejected Manuscripts

1. Maxwell Knapp, **David J. Seward**, Melanie R. Bui. (2018) Effects of Comorbidity and AJCC 7 Stage on Time to Treatment Initiation for Melanoma at the University of Vermont Medical Center. Rejected by JAMA DERM.
2. Liam L. Donnelly, Tyler C. Hogan, Hailey M. Sarausky, Sean M. Lenahan, Jenna G. Eaton, Meagan A. Lebeau, Cai L. McCann, Kenneth J. Hampel, Jordan D. Armstrong, Margaret P. Cameron, Nikoletta Sidiropoulos Paula Deming, **David J. Seward**. Functional Assessment of Somatic STK11 Variants Identified in Non-Small Cell Lung Cancer and the Implications for Predicting Anti-PD1 Therapy Response (**2020**) *npj Precision Oncology*
3. Liam L. Donnelly, Tyler C. Hogan, Hailey M. Sarausky, Sean M. Lenahan, Jenna G. Eaton, Meagan A. Lebeau, Cai L. McCann, Kenneth J. Hampel, Jordan D. Armstrong, Margaret P. Cameron, Nikoletta Sidiropoulos Paula Deming, **David J. Seward**. Functional Assessment of Somatic STK11 Variants Identified in Non-Small Cell Lung Cancer and the Implications for Predicting Anti-PD1 Therapy Response (**2020**) *Cancer Research*
4. Caspar Schiffers; Christopher Dustin, PhD; Lennart Lundblad, PhD; Milena Hristova; Aida Habibovic; **David Seward, MD, PhD**; Nirav Daphtary; Minara Aliyeva; Emiel Wouters, MD, PhD; Niki Reynaert, PhD, Dr Albert van der Vliet, PhD. Downregulation of DUOX1 contributes to aging-

related impairment of innate airway injury responses and accelerated senile emphysema. *Redox Biology* (2020).

In Press – *N/A*

Submitted – *N/A*

Non-Peer Reviewed Publications

Review Articles- None to date.
Books and Chapters - None to date.
Other Scholarly Publications - None to date.

Abstracts

1. Ballatori, N., Donald, A., **Seward, D. J**., Beal, A., Fisher, Boyer, J. L. Divalent metals modulate the osmoregulatory taurine efflux pathway in skate (*Raja erinacea*) hepatocytes. *MDIBL Bulletin* 36: 83, 1997.
2. Ballatori, N., Donald, A., **Seward, D. J.,** Beal, A., Fisher, A., Runnegar, M., Boyer, J. L. Regulation of swelling-activated taurine efflux in skate (*Raja erinacea*) hepatocytes by ATP and protein phosphatase inhibitors, but not by arachidonic acid metabolites. *MDIBL Bulletin* 36: 81-82, 1997.
3. Ballatori, N., Barnes, D. M., **Seward, D. J.,** O'Connell, D., Toure, J., Dobak, L., Henson, J. H., Runnegar, M., Miller, D. S., Xie, Z., Boyer, J. L. A long-term primary culture model of hepatocytes isolated from the little skate (*Raja erinacea*). *MDIBL Bulletin* 37: 85-86, 1998.
4. Fricker, G., Gutman, H., **Seward, D. J**., Droulle, A., Miller, D. S., Boyer, J. L. Functional evidence for the multidrug resistance associated protein (MRP2; cMOAT) in cultured skate hepatocytes. *MDIBL Bulletin* 38: 72-73, 1999.
5. Ballatori, N., **Seward, D. J.,** Fricker, G. Runnegar, M., Henson, J. H., Miller, D., Boyer, J. L. Retention of structural and functional polarity in cultured skate (*Raja erinacea*) hepatocytes. *MDIBL Bulletin* 41: 73-74, 2002.
6. **Seward, D. J.,** Anderson, R., Bennet, C., McCoy, J., Cai, S. Y., Boyer, J. L., Ballatori, N. Beta-Actin mRNA expression is markedly upregulated whereas its protein levels are unchanged in primary skate hepatocyte cultures from the little skate (*Raja erinacea*). *MDIBL Bulletin* 41: 74-75, 2002.
7. **Seward, D.J.,** Schonewald, M., Bentley, D.L. Dynamic regulation of histone methylation: the demethylase chase no longer a wild goose: Progress and Implications. Presented as a Poster at: The Williams College 1960's Scholar Alumni Research Symposium; Williamstown, MA (March 2006).
8. **Seward, D.J.,** Schonewald, M., Bentley, D.L. Dynamic regulation of histone methylation. Presented as a Poster at the University of Colorado Molecular Biology Program Symposium entitled Stem Cell Biology: Progress & Potential; Denver, CO (April 2006).
9. **Seward, D.J.,** Schonewald, M., Bentley, D.L. Dynamic regulation of histone methylation by a family of novel demethylases. Presented as a Poster at the 21st Annual National MD/PhD Student Conference; Keystone, CO (July 2006).
10. **Seward, D.J.,** Cubberley, G., Kim, S., Schonewald, M., Zhang, L., Tripet, B., and Bentley, D.L. Demethylation of Trimethylated Histone H3 Lys4 in vivo by the JARID1 Family Proteins. Presented as a Poster at the University of Colorado Molecular Biology Program Symposium entitled Epigenetics: Beyond the Sequence; Denver, CO (April 2007).
11. **Seward, D.J.,** Cubberley, G., Kim, S., Schonewald, M., Zhang, L., Tripet, B., and Bentley, D.L. Demethylation of Trimethylated Histone H3 Lys4 in vivo by the JARID1 Family Proteins. Presented as a Poster at the 22nd Annual National MD/PhD Student Conference; Keystone, CO (July 2007).
12. **Seward, D.J.,** Cubberley, G., Kim, S., Schonewald, M., Zhang, L., Tripet, B., and Bentley, D.L. Demethylation of Trimethylated Histone H3 Lys4 in vivo by the JARID1 Family Proteins Apoptosis and Autophagy: Programs of Cell Death. Molecular Biology Program Symposium, Denver, CO (April 2008): Poster
13. **Seward, D.J.,** Cubberley, G., Kim, S., Schonewald, M., Zhang, L., Tripet, B., and Bentley, D.L.

Demethylation of Trimethylated Histone H3 Lys4 in vivo by the JARID1 Family Proteins 23rd Annual National MD/PhD Student Conference; Keystone, CO (July 2008): Poster

14. **Seward, D.J.,** Cubberley, G., Kim, S., Schonewald, M., Zhang, L., Tripet, B., and Bentley, D.L. Demethylation of Trimethylated Histone H3 Lys4 in vivo by the JARID1 Family Proteins Molecular Biology and the Environment: Biofuels and Bioremediation. Molecular Biology Program Symposium, Denver, CO (April 2009): Poster
15. **Seward, D.J.,** Cubberley, G., Kim, S., Schonewald, M., Zhang, L., Tripet, B., and Bentley, D.L. Demethylation of Trimethylated Histone H3 Lys4 in vivo by the JARID1 Family Proteins. Presented as a Poster at Days of Molecular Medicine; HUMAN GENETICS, STEM CELLS AND PHYSIOLOGY: THE FUTURE OF INDIVIDUALIZED MEDICINE; sponsored by Mass Gen Hosp, Karolinska Institute and Cell Press; Boston, MA (May 2009).
16. **Seward, D.J**., Cubberley, G., Kim, S., Schonewald, M., Zhang, L., Tripet, B., and Bentley, D.L. (2009, July). Identification and Characterization of the Jarid1 Histone Demethylases Jarid1B and KDM5. Presented as a Poster at the 24th Annual National MD/PhD Student Conference; Keystone, CO (July 2009).
17. **Seward, D.J.,** Cubberley, G., Kim, S., Schonewald, M., Zhang, L., Tripet, B., and Bentley, D.L. Demethylation of Trimethylated Histone H3 Lys4 in vivo by the JARID1 Family Proteins. Presented as a Poster at the Cold Spring Harbor Meeting: Mechanisms of Eukaryotic Transcription; Cold Spring Harbor, NY (Aug. 2009).
18. **David J. Seward, MD, PhD**, Sarah Bergholtz, Elisabeth Pedersen, Mary Skinner, Jeongsoon Park, PhD, Elizabeth R. Lawlor, MD, PhD, and David Lombard, MD, PhD. SIRT5 IS REQUIRED FOR VIABILITY OF THE EWING SARCOMA CELL LINE A673 AND THE OSTEOSARCOMA CELL LINE U2OS. 27th Annual Cancer Center Research Symposium, Ann Arbor, MI (Sept. 2015): Poster
19. **David J. Seward, MD, PhD**, Sarah Bergholtz, Elisabeth Pedersen, Mary Skinner, Jeongsoon Park, PhD, Elizabeth R. Lawlor, MD, PhD, and David Lombard, MD, PhD. SIRT5 IS REQUIRED FOR VIABILITY OF THE EWING SARCOMA CELL LINE A673 AND THE OSTEOSARCOMA CELL LINE U2OS. 105th Annual USCAP Meeting, Seattle, WA (March 2016): Poster
20. Association of Molecular Pathology Annual Meeting, Abstract and Poster (Nov 2016). MethyLight is a Robust Method for MLH1 Promoter Methylation Testing in Colorectal and Endometrial Adenocarcinoma **D.J. Seward,** A.S. Leonard, H.C. Weigelin, N.A. Brown, B.L. Betz. University of Michigan, Ann Arbor, MI. The Journal of Molecular Diagnostics. 2016-11-01, Volume 18, Issue 6, Pages 937-1052.
21. Northern New England Clinical Oncology Society (NNECOS) Annual Meeting, Stowe, VT (2017): Effect of Tumor Volume Doubling Time (VDT) on Prognosis for Stage I Non-Small Cell Lung Cancer: An Update. Hyunsoo J. No, **David J. Seward**, Takamaru Ashikaga, Matt Kinsey, Nikoletta Sidiropoulos, Havaleh M. Gagne, Carl J. Nelson, Janusz Kikut, George Gentchos, Garth W. Garrison, Edmund Folefac, Bruce Leavitt, Konstantin H. Dragnev, Steven H. Lin, Christopher J. Anker.
22. Sidiropoulos N, Babcock M, de Abreu FB, Dufresne S, Hampell K, Lebel K, Loo EY, Peterson JD, Scott C, **Seward D**, Skacel M. The Northern New England Genomics Consortium. In JOURNAL OF MOLECULAR DIAGNOSTICS (2017) Nov 1 (Vol. 19, No. 6, pp. 1007-1007).
23. American Thoracic Society (ATS) Meeting, San Diego, CA (2018); accepted for poster presentation: GENES ENCODING REDOX HOMEOSTASIS REGULATORS DEMONSTRATE REDUCED EXPRESSION WITH AGE IN NORMAL HUMAN LUNG. **David J. Seward**, Evan Elko, Vikas Anathy, Jos L.J.L. van der Velden, Albert van der Vliet and Yvonne M.W. Janssen-Heininger. *AMERICAN JOURNAL OF RESPIRATORY AND CRITICAL CARE MEDICINE* (Vol. 197).
24. UVM Student Research Day, Burlington, VT (2018): "Finally spliced together, clinically observed *STK11* splice-site variants affect exon splicing *in vitro* and *in vivo."* Donnelly, L. Sarausky, H. **Seward, DJ.**
25. ASCO 2018 Annual Meeting, Chicago, IL (2018). "Investigation of discordant sibling pairs from hereditary breast cancer (HBC) families." Kara Landry, **David Seward**, Julie Dragon, Wendy McKinnon, Laura S Colello, Joann Sweasy, Susan Wallace, Melissa Cuke, and Marie Wood. Journal of Clinical Oncology 2018 36:15_suppl, 1538-1538
26. Association of Molecular Pathologist (AMP) 2018 Annual Meeting, San Antonio, TX (2018).

"Establishing the Impact of STK11 Canonical Splice Site Variants Identified by NGS Panel Testing in Non-Small Cell Lung Cancers (NSCLC): Prognostic and Therapeutic Implications" **David J. Seward**, Liam L. Donnelly, Hailey M. Sarausky, Jordan Armstrong, Margaret Cameron, Paula Deming, Kenneth Hampel, Nikoletta Sidiropoulos. *JOURNAL OF MOLECULAR DIAGNOSTICS* (Vol. 20, No. 6, pp. 982-982).

27. USCAP 2019 Annual Meeting, Baltimore, MD. "Prognostic and Therapeutic Implications of STK11 Canonical Splice Site Variants Identified by NGS Panel Testing in Non-Small Cell Lung Cancers (NSCLC)". Liam L. Donnelly, Hailey M. Sarausky, Jordan Armstrong, Margaret Cameron, Paula Deming, Kenneth Hampel, Nikoletta Sidiropoulos, **David J. Seward**.
28. C Schiffers, C Dustin, M Hristova, A Habibovic, L Lundblad, **D Seward**, NL Reynaert, EFM Wouters, A Van Der Vliet. Downregulation of Lung DUOX1 During Aging Attenuates Innate Epithelial Injury Responses and May Predispose Development of COPD. C93. MECHANISMS OF AIRWAY INFLAMMATION IN ASTHMA AND COPD, A5562-A5562.
29. Caspar Schiffers, Niki L. Reynaert, Christopher Dustin, Lennart Lundblad, Milena Hristova, Aida Habibovic, **David Seward**, Emiel F M Wouters, Albert Van Der Vliet. "Age-related loss of DUOX1 in the lung: implications for innate injury responses and pulmonary emphysema." *European Respiratory Journal* **54**, OA3591, doi:10.1183/13993003.congress-2019.OA3591 (2019).
30. Donnelly LL, Lenahan S, Gao C, Sarausky HM, Hogan T, Paula Deming P, **Seward DJ**. "STK11 Loss of Function Variants Mediate Immune Evasion in NSCLC via Dysregulation of the FAK/Hippo Signaling Axis and Subsequent Alterations in Tumor-Intrinsic Cytokine Expression" *Journal of Molecular Diagnostics* 2019 (Vol. 21, No. 6, pp.1212-1212).
31. Sean M. Lenahan, Hailey M. Sarausky, **David J. Seward.** Stochastic loss of GLUL expression correlates with STK11-loss-dependent glutamine addiction and may impact anti-PD1 therapy resistance in NSCLC. American Association for Cancer Research (AACR) Annual Meeting (2021).
32. Hailey M. Sarausky Sean M. Lenahan, **David J. Seward.** Utilizing RNAscope to assess STK11-LoF-dependent transcriptional phenotypes in human NSCLC biopsies and evaluate its potential to predict anti-PD1 therapy response. American Association for Cancer Research (AACR) Annual Meeting (2021).
33. **David J. Seward.** STK11-loss-dependent YAP1-mediated transcriptional activation promotes immune evasion in KRAS-driven lung adenocarcinoma. American Association for Cancer Research (AACR) Annual Meeting (2021).
34. Sean M. Lenahan, Hailey M. Sarausky, **David J. Seward.** STK11 is an Indirect Sensor of Cellular Glutamine and Regulates Tumor Intrinsic Cytokine Expression in KRAS-driven NSCL Adenocarcinomas. *Journal of Molecular Diagnostics (*2021).
35. Sean M. Lenahan, Hailey M. Sarausky, **David J. Seward.** Reduced GLUL Expression Correlates with STK11 Loss of Function in Human KRAS-driven NSCLC Cell Lines. *Keystone Symposium: Tumor Metabolism*, Fairmont Banff Springs, BC (2022).
36. Katherine J Horrigan, Sean M Lenahan, Erin E Mathieu, Cameron A Moquin, Oliver Dienz, **David J Seward**, Jonathan E Boyson. Investigation of γδ T cell function in a novel inducible model of lung adenocarcinoma. The Journal of Immunology, 2023.
37. SM Prior, SM Lenahan, HM Sarausky, **DJ Seward** , P Deming. Metabolic rewiring and metastatic potential in STK11-null lung adenocarcinoma. Cancer Research, 2023

Patents Issues for Pending - *None to date*
Other Creative Activities - *None to date*
Quality Improvement and Patient Safety Activities - *None to date*

SUMMARY OF SCHOLARLY ACTIVITIES

75% of my time has been protected for research. Over the course of the past year I have been active submitting grants (2/5 funded, ~$450,000 in total funds) to go along with grants received in the prior years (4/7 funded, >$160,000 in total funds), manuscripts (four accepted, two in preparation) and five

abstracts accepted at international meetings. We are actively planning our next series of grant applications and manuscripts. I expect 2023 to be another successful year.

INVITED PRESENTATIONS

Local

2015	University of Vermont Department of Pathology "An oncogenic role for SIRT5 in sarcomas"	Burlington, VT
2016	University of Vermont Cancer Center "Leveraging Public Data: Case Studies in Hypothesis Generation and Preliminary Data Acquisition"	Burlington, VT
2018	University of Vermont Cancer Center "Genomic organization of histone locus body (HLB), a histone gene regulatory domain in breast cancer: ACS work in progress update"	Burlington, VT
2019	University of Vermont Genetics and Genomics Interest Group "Adventures in Functional Genomics: Modeling clinically identified STK11 variants of uncertain significance"	Burlington, VT
2022	University of Vermont Hematology and Oncology Grand Rounds "STK11 loss in KRAS-driven NSCLC"	Burlington, VT
2022	University of Vermont Department of Pathology and Laboratory Medicine Grand Rounds "Modeling STK11 missense variants"	Burlington, VT
2023	University of Vermont Department of Medicine Grand Rounds "Mechanisms linking STK11 loss with anti-PD1 therapy resistance"	Burlington, VT
2022	University of Vermont Lung Center	Burlington, VT
2022	Research Day, Spatial Transcriptomics	Burlington, VT
2023	Research Day, GEMMs	Burlington, VT

Regional

2002	9th Annual Mount Desert Island Biological Laboratory's Environmental Health Sciences Symposium. "Identification of novel detoxification genes using marine vertebrates"	Salsbury Cove, ME
2018	Williams College Department of Biology "Parlez-vous VUS? Functional genomics in the age of clinical sequencing"	Williamstown, MA

National

2009	University of Colorado, Biochemistry Departmental Guest Seminar "Part I: Identification of the S. cerevisiae protein KDM5 as a histone H3K4 demethylase. Part II: A potential role	Aurora, CO

	for KDM5 in the regulation of H3K4 methylation and chromatin structure during meiosis."	
2016	University of Michigan Department of Pathology, 7th Annual Anatomic, Molecular and Hematopathology Research Day "SIRT5 in EWS Oncogenesis"	Ann Arbor, MI
2019	Association of Molecular Pathology (AMP) "STK11 Loss of Function Variants Mediate Immune Evasion in NSCLC via Dysregulation of the FAK/Hippo Signaling Axis and Subsequent Alterations in Tumor-Intrinsic Cytokine Expression"	Baltimore, MD

International

2018	Genomenon "Mining Genomic Literature for Variant Interpretation and Gene Panel Design"	Webinar

University Outreach | Community

2023-present	Vermont Cancer Center Ambassador