Meet the **Scientist**

It may be a microscopic parasite, but *Cryptosporidium*—commonly known as *Crypto*—can have an outsized impact on human health. Spread through contact with feces from infected humans or animals, it’s a leading cause of waterborne illness in the United States, to the tune of nearly 750,000 cases annually. Despite its devastating symptoms, which may include diarrhea, vomiting and fever, no one really understands how the parasite makes people so sick.

**Caroline Lyon, M.D.’02, M.P.H.,** an associate professor in the Division of Primary Care Internal Medicine, hopes to change that. She’s studying the human immune response to the parasite, in the hopes that knowing more about how the disease naturally progresses will lead to new therapeutics or maybe even a vaccine, something that doesn’t yet exist. Through her dual role as a hospitalist at The UVM Medical Center and researcher with UVM’s Vaccine Testing Center (VTC), she helps shepherd the research, as well as care for the people who make the research possible. Volunteers who participate in vaccine challenge trials for diseases like cholera and Campylobacter are often required to stay at the hospital to manage any symptoms they experience, and Lyon is there to make sure they have the best care possible. One recent success story: A trial involving the VTC as one of three sites nationwide to test a single-dose oral cholera vaccine showed promising results. The vaccine is now moving on for FDA approval, potentially paving the way for an easy-to-administer vaccine especially useful in developing countries that struggle with the disease.
With the start of 2016 only a few months away, I wanted to take a moment to look back at the past year and all of the Department of Medicine’s accomplishments. We’re growing in number and in scope, taking on exciting new initiatives in all areas of our mission. One theme seems to be collaboration and coordination. Our department has expanded its clinical practice to include our University of Vermont Health Network partners in several different specialty areas. Here in Vermont, we’ve developed a number of new multidisciplinary clinics, as well as a lung cancer screening program that includes faculty leaders from two divisions. When it comes to education, our affiliation with Norwalk Hospital and the Western Connecticut Health Network continues to thrive – we now have students completing their acting clerkship in medicine at Norwalk Hospital, and we’re looking forward to many more exciting projects with these partners in the years to come.

In this issue of The Chart, we learn more about current happenings in the Division of Rheumatology and Clinical Immunology, including some new initiatives they’re spearheading focused on interprofessional education and cost-conscious care. We also highlight several significant grants recently received by faculty in the department. These researchers are truly leading the way, driving new knowledge in a diverse array of fields, from lung tissue bioengineering to imagining new models for health care coordination. It’s gratifying to see our department faculty consistently find funding success when research dollars are hard to come by and competition is fierce. It speaks to our collective talent and our vision for the future, and I am excited to see what 2016 brings!

Polly E. Parsons, M.D.
E.L. Amidon Professor and Chair, Department of Medicine
UVM Hosts Tenth Annual Stem Cell Conference at UVM

More than 160 scientists from around the world came to Vermont and UVM for the tenth anniversary and sixth “Stem Cells, Cell Therapies, and Bioengineering in Lung Biology and Lung Diseases Conference,” from July 27 – 30, 2015. The meeting, held biannually at UVM since 2005, was co-founded by DANIEL WEISS, M.D., PH.D., professor in the Division of Pulmonary Disease and Critical Care Medicine. Over the past ten years, the meeting has promoted the development of clinical trials of cell therapies for pulmonary diseases and critical illnesses including acute respiratory distress syndrome (ARDS), sepsis/septic shock, pulmonary hypertension, asthma, and more.

Jensen Named Associate Dean for Research

GORDON L. JENSEN, M.D., PH.D., has been appointed senior associate dean for research at the UVM College of Medicine. He will also serve as professor of medicine and professor of nutrition and food sciences in the College of Agriculture and Life Sciences. Jensen joins UVM from Penn State University, where since 2007 he has been professor and head of the Department of Nutritional Sciences – one of the very top nutrition departments in the country – as well as professor of medicine at Penn State College of Medicine and Hershey Medical Center. Board-certified in nutrition and internal medicine, Jensen has clinical expertise in adult nutrition support interventions, outpatient clinics for malnourished patients, and high-risk obesity management. Jensen succeeds Russell Tracy, Ph.D., professor of pathology and biochemistry and former senior associate dean for research and academic affairs, who has served as interim senior associate dean for research since July 2014.

Leahy Named Professor of Diabetes Research

JACK L. LEAHY, M.D., has been named the inaugural Sarah Nichols Gruenig Green & Gold Professor of Diabetes Research. His research interests cover the biology of pancreatic beta-cells - how they compensate normally to various metabolic stresses, and why that fails to cause type 2 diabetes. Leahy is a professor and co-director of the Division of Diabetes, Endocrinology and Metabolism.
Multi-Million Dollar Grants Lead to New Knowledge & Discoveries

From important health care quality improvement studies to work on the frontlines of bioengineering, human tissue, faculty in the Department of Medicine consistently bring in prestigious grants from national government agencies and non-profit organizations. This year has been no exception: The three recent grants profiled here represent almost $22 million in funding for leading-edge research in a variety of fields. “Although research funding continues to be challenging with the decline in the NIH budget, the research program in the department remains strong,” says Department Chair POLLY PARSONS, M.D. “Not only did the amount of money received for funding significantly increase this year, faculty received funding from new, highly competitive sources and for new, cutting edge areas of investigation.”

Integrating Behavioral Health and Primary Care

The Henry and Carleen Tufo Chair in General Internal Medicine BENJAMIN LITTENBERG, M.D., and several UVM colleagues have been approved to receive an $18.5 million grant for a five-year research project titled “Integrating Behavioral Health and Primary Care.” The Patient-Centered Outcomes Research Institute (PCORI) selected the group’s project as one of just four nationwide to receive funding out of 124 original applications. Through working with 30 practices nationwide, as many as 2,000 patients, the project will examine the benefits of fully integrating behavioral health care with primary care. The group will compare integrated practices – which may mean primary care and mental health clinicians sharing notes, using the same nurses and support staff, or coordinating appointment and billing offices – to those using the co-located model of simply hosting behavioral therapists within a primary care practice. “The question here is really about how to design the systems for better care,” says Littenberg. Key to the research is the inclusion of three patients who will serve as funded co-investigators. Rodger Kessler, Ph.D., associate professor of family medicine, and CONSTANCE VAN EEGHEN, Dr.P.H., assistant professor of medicine, will help lead the project as co-principal investigator and project director respectively.

Studying Vaccine Efficacy

Understanding and remedying why some vaccines are not as effective in developing world settings is the goal and challenge of a new $2.2 million 2.5-year research award from the Bill & Melinda Gates Foundation to University of Vermont Vaccine Testing Center (VTC) investigators. Led by Professor and VTC Director BETH KIRKPATRICK, M.D., co-investigators on the grant include SEAN DIEHL, Ph.D., E. Ross Colgate, M.P.H., Dorothy Dickson, M.Sc., and Benjamin Lee, M.D. The grant, titled “Improving Rotavirus Vaccination: Rehining Correlates of Protection and Evaluating Durability,” builds on previous Gates Foundation-supported research performed by VTC team members between 2010 and 2014. The team will be using sophisticated immunologic techniques and advanced statistical modeling to better understand vaccine underperformance and predict durability. “We are particularly excited about this opportunity”, says Kirkpatrick. “It builds upon our interest and expertise in understanding the principles of correlates of protection in infants and children in developing countries and will help us better understand and improve their responses to vaccines.”

Lung Tissue Bioengineering

Professor DANIEL WEISS, M.D., Ph.D., has received a $1.25 million, four-year R01 grant from the National Heart, Lung and Blood Institute for “Optimizing Functional Recellularization of Acellular Human Lung Scaffolds.” The grant furthers previous work from Weiss and collaborators Darcy Wagner, Ph.D., at the Comprehensive Pneumology Center (CPC) at the Ludwig-Maximilians-Universität in Munich, Germany, and Rachael Oldinski, Ph.D., a UVM assistant professor of mechanical engineering. Their research focuses on lung tissue bioengineering: ‘They are working on using a scaffold – or framework – of lungs from human cadavers to engineer new lungs for patients with end-stage disease. The goal is to strip the cellular material from these lungs – called decellularization – and replace it with stem cells (recellularization), in an effort to grow new, healthy lungs for transplantation. The most recent NHLBI grant will allow Weiss and Oldinski to provide a detailed assessment of the effects on lung mechanics from using an alginic acid coating as part of the recellularization of human lung pieces. Previous studies have shown that applying the coating – a nontoxic, natural polymer derived from seaweed – to each lung segment prior to recellularization allows the team to selectively inject new stem cells into the small decellularized lung segments while preserving vascular and airway channels. Use of this technique has resulted in a higher retention of human stem cells in both animal and human scaffolds. With the latest grant, the goal is to understand in more detail the implications of this work as well as explore future uses for the coating.”
Rheumatology and Clinical Immunology

The past 15 years have seen a “revolution” in care for patients suffering from autoimmune diseases such as vasculitis, lupus and rheumatoid arthritis, in large part thanks to new biologic therapies, says Bonita Libman, M.D., professor and chief of the Division of Rheumatology and Clinical Immunology. But there is still more work to be done, and the division is leading the way in many areas of research as well as in training the next generation of physicians to deliver integrated and cost-conscious care.

The division maintains a robust clinical practice, seeing roughly 1,200 patients per month through the outpatient clinic and Osteoporosis Center at The UVM Medical Center. A metabolic bone clinic is an “important part of the division’s specialty service,” says Libman, with patients coming from a wide geographic area. The division’s eight physicians and one physician’s assistant also maintain outreach clinics at UVM Health Network/Central Vermont Medical Center in Berlin and Copley Hospital in Morrisville. Additional clinical services include an upcoming fracture liaison service – through which division members evaluate inpatients for osteoporosis or other conditions that may have predisposed them to a fracture – as well as an on-site infusion center and point of care musculoskeletal ultrasound.

The Osteoporosis Center, established in 1990, has for years played a key role in important research. Under the leadership of Professor Edward Leib, M.D., the center’s growing database of over 25,000 bone density scans contributes to new knowledge about osteoporosis. Leib is internationally known for his work on guidelines for the appropriate use of bone densitometry. The division also participates in an ongoing multicenter study, led by Brigham and Women’s Hospital and funded by the NIH, that focuses on quality improvement for treatment of rheumatoid arthritis (RA). Through the program offered by the Institute for Healthcare Improvement, participants utilize “treat-to-target,” a treatment paradigm focused on shared decision-making between patient and provider. With Assistant Professor Nicole Hynes, M.D., as the division’s team leader, the goal is to improve compliance and outcomes related to RA.

Understanding the pathophysiology of RA and other rheumatic diseases is a research focus for the division. Professor Sheldon Cooper, M.D., and Professor Mercedes Rincon, Ph.D., are conducting studies to evaluate the effect of Interleukin 6 inhibitor on IgG4 antibodies of patients with RA. Assistant Professor Narandra Bethina, M.D., is looking at musculoskeletal ultrasound results in tandem with clinical examination to determine whether specific physical exam findings may help diagnose conditions in patients with hip pain. The division also participates in many pharmaceutical trials for RA, lupus, psoriatic arthritis and other diseases. Basic science research is ongoing: Professor Ralph Budd, M.D., is exploring T-cell homeostatic proliferation in RA and lupus, among other studies.

One important new initiative focuses on improving how healthcare providers – specifically fellows – work together in a patient care setting. The effort brings together rheumatology, nephrology and pathology fellows at UVM Medical Center for multidisciplinary team-based learning exercises. The goal is to reinforce excellent skills in multidisciplinary care, an important component of “systems-based practice,” says Libman. “Each fellow has a slightly different knowledge set, and when we are able to get out of our silos and pool resources, we improve care.” The initiative is designed as a research study and has Institutional Review Board approval, with results expected to help others develop and refine new methods to train the next generation of physicians.

Education continues to be a fundamental component of the division’s mission, with a well-established fellowship program dating back to 1982. The two-year program brings in one fellow annually and has been recognized with five consecutive Rheumatology Research Foundation fellowship training awards from 2010 to 2015. Internal medicine residents rotate through the division, and fourth-year medical students complete one-month electives. Faculty members and fellows are highly involved with the Vermont Integrated Curriculum, teaching didactics, physical exam skills, and team-based learning sessions as part of the Connections course at the beginning of the second year. Associate Professor Chi Chi Lau, M.D., plays a lead role in team-based learning efforts. Libman is involved in curriculum development locally and nationally; she was instrumental in designing Connections and has also helped to develop the American College of Rheumatology fellowship In-Training Examination in cooperation with the National Board of Medical Examiners. Faculty regularly attend and present at national conferences, including national and regional meetings of the American College of Rheumatology, contributing their expertise to peer institutions across the country and around the world.
Claire Verschraegen, M.D., working full time. The authors feel confident that this individualized approach to care could be an option for pregnant patients to consider.

Professor CLAIRE VERSCHRAEGEN, M.D., chief of the Division of Hematology/Oncology, and colleagues published a Research Letter in Online First JAMA Oncology, which described the first known case of Uninothorax as a complication of continuous bladder irrigation in a patient with toxic liver injury. The study was published in the August 2015 issue of the Journal of Thoracic Oncology.

Recent Presentations

Internal medicine resident JACQUELINE O’TOOLE, D.O., JASON BATES, PH.D., RENEE Stapleton, M.D., M.P.H., and MATTHEW KINSEY, M.D., presented "Managing Lung Cancer Screening And Its Downstream Findings" at the American Lung Association Conference in Dallas, Texas, May 2015.

MARY CUSHMAN, M.D., M.S.C., delivered the keynote address titled "Is It Time to Take on Inflammation?" at the American Society for Preventive Cardiology Annual Cardiovascular Disease Prevention Conference in Boca Raton, Florida, July 2015.

Internal medicine resident TARA SCRIBNER-METCALF, M.D., and JOSHUA FARKAS, M.D., presented "Urinary incontinence: the First Known Case of Urinary Incontinence as a Complication of Continuous Bladder Irrigation CS1: Toxic Ingestions and Exposures" at the American Thoracic Society Meeting in Denver, Colorado, May 2015.

GLENN GOLDMAN, M.D., and TODD HOLMES, M.D., were invited to speak at the annual South African Society for Dermatologic Surgery conference in central Drakensberg, August, 2015.

Grant Highlights

KAREN FORTNER, PH.D., assistant professor in the Division of Immunobiology, received $190,625 in funding from the National Institute of Allergy and Infectious Diseases/NIH/DHHS for "T Lymphocyte Homeostasis in Obesity."

The Vermont Lung Center, under the leadership of CHARLES IRVIN, PH.D., has successfully renewed the T32 training grant from the National Heart, Lung, and Blood Institute for "Cardiovascular Training in Lung Biology" in the amount of $428,304 for the period 5/1/15 – 4/30/16.

DAVID SCHNEIDER, M.D., is principal investigator for a $371,915 grant from Janssen Research & Development, LLC, for "Novel Biomarkers of Thrombotic Risk."

JEFFREY SPEES, PH.D., associate professor in the Division of Cardiovascular Medicine, has received $333,594 in funding from the National Institute of Neurological Disorders and Stroke/NIH/DHHS for "Control of Reactive Astrocytes by Notch1 and Amyloid Precursor Protein."

Rincon Hosts Talk at SPARK Conference

MERCEDES RINCON, PH.D., professor in the Division of Immunobiology, represented the UVM SPARK-VT program at the first SPARK International Conference in Taipai, Taiwan, in August of 2015. She was invited to give a talk along with seven other representatives from SPARK programs around the world, with a goal to share information and create a global SPARK program that supports researchers as they move their work from bench to bedside.

Founded by the Department of Medicine in 2012, SPARK-VT expanded to a university-wide program in 2014.

Publication Highlights

LEIB E. Bone Status in Glucocorticoid-Treated Men and Women, Osteoporosis Int 2015 Aug 8.


Medical Student News

With MARY CUSHMAN, M.D., M.S.C., as mentor, SARAH GILLETT, M.D.’15, PH.D., was first author for a paper published in Clinical Neuropsychology titled “Correlates of incident cognitive impairment in the Reasons for Geographic and Racial Differences in Stroke (REGARDS) study case-cohort sample.” The American Society of Hematology has selected CHRISTINA CAHILL ’18 to receive the ASH Honors Award, which supports hematology research projects for medical students and residents who are interested in hematology but have not yet entered a hematology-related training program. MARY CUSHMAN, M.D., M.S.C., professor of medicine, serves as her mentor.

DAVID KAMINSKY, M.D., a professor in the Division of Pulmonary Disease and Critical Care Medicine, served as mentor for a public health project on asthma management in schools that has prompted statewide action. Eight students in the Class of 2016 developed an electronic survey and distributed it to 189 school nurses in Vermont. In spring 2014, the medical students presented their project to the state’s Asthma Advisory Board, which prompted a needs assessment and a series of recommendations to better support school nurses to care for students with asthma from the Centers for Disease Control and Prevention-supported Vermont Asthma Program.

GRADUATED RESIDENTS: Where Are They Now?

ZUBIN AGARWAL, M.D., Cardiology Fellowship, Jackson Memorial, Miami, Florida
TIMOTHY ARLING, M.D., Primary Care Practice, Washington, D.C.
MARIA BURNETT, M.D., Chief Medical Resident, UVM Medical Center
CHRISTOPHER DADO, M.D., Pulmonary/Critical Care Fellowship, Brown University, Providence, Rhode Island
MARKUS DEGIRMENCI, M.D., Hospitalist, Brown University, Providence, Rhode Island
JONATHAN HALEVY, M.D., Chief Medical Resident, UVM Medical Center
BRIAN KOENEN, M.D., Hospitalist, New Orleans, Louisiana
MAX LOPEZ, M.D., Hospitalist, University of Mississippi –Jackson, Miss.
RACHEL MCENTEE, M.D., Chief Medical Resident, UVM Medical Center
LYNN PESTA, M.D., Primary Care Practice, Providence, Rhode Island
PATRICK SANDIFORD, M.D., Emergency Medicine Residency, University of Rochester, Rochester, NY.
GAYATHRI THAMPATTY, M.D., Hospitalist, Bangor, Maine
CHARITA VADLAMUDI, M.D., Hospitalist, North Carolina

New Residency Program Video Launched

A new video on the internal medicine residency program, created by artist and videographer Bassem Eldakar, has been launched to augment recruitment efforts on the website. Created in July 2015, it was developed with consultation from the internal medicine residency leadership, including Assistant Professor SHADEN ELDAKAR-HEIN, M.D., (also sister of the videographer), Associate Professor MARY RAMUNDO, M.D., Associate Professor MARK PASANEN, M.D., and Department Chair POLLY PARSONS, M.D. The video features interviews with faculty and current residents. Watch the video here: uvm.edu/medicine/medicine

Education Notables

HAROLD DAUERMAN, M.D., professor in the Division of Primary Care Internal Medicine, is teaching a new Honors course for UVM Medical Group members. Called “Introduction to Clinical Research Using Existing Data,” it is designed for clinicians who want to develop their role as academic investigators by using the information available in PRISM and the clinical data warehouse to study medical and health care issues. The course takes place over 16 Fridays from October 2015 to July 2016. Twenty participants were selected and the first session began October 2.

ALAN RUBIN, M.D., associate professor in the Division of Primary Care Internal Medicine, is teaching a new Honors College seminar for sophomores on opiate addiction. With his years of experience and contacts, Rubin plans to bring in university and state experts to guide the class in looking at the science, the economics, the policy and politics behind the opiate epidemic.

Christina Cahill ’18, David Kaminsky, M.D.

Chava Earns AHA Award

Cardiology fellow SREEDIVYA CHAVA, M.D., was selected to receive a Women in Cardiology Trainee Award for Excellence by the American Heart Association (AHA). This honor comes with an invitation to the 2015 Scientific Sessions of the AHA, where she will be presented the award.

Anne Fadiman (left) with Polly Parsons, M.D.
Faculty Promotions

Congratulations to the following faculty who were promoted effective July 1, 2015.

Promoted to Professor

THOMAS JETTON, PH.D., Division of Diabetes, Endocrinology and Metabolism

YOLANDA MAGETO, M.D., Division of Pulmonary Disease and Critical Care Medicine

MATTHEW POYNTER, PH.D., Division of Pulmonary Disease and Critical Care Medicine

BENJAMIN SURATT, M.D., Division of Pulmonary Disease and Critical Care Medicine

Promoted to Associate Professor

MATTHEW GILBERT, M.D., Division of Diabetes, Endocrinology and Metabolism

LENNART LUNDBLAD, PH.D., Division of Pulmonary Disease and Critical Care Medicine

CAROLINE LYON, M.D., M.P.H., Division of Primary Care Internal Medicine

HALLE SOBEL, M.D., Division of Primary Care Internal Medicine

Faculty Notables

JASON BATES, PH.D., professor in the Division of Pulmonary Disease and Critical Care Medicine, received the Institute of Electrical and Electronic Engineers (IEEE) Region 1 Technological Innovation (Academic) Award for outstanding scientific contributions in the development of innovative technologies for assessing lung function.

AMANDA KENNEDY, PHARM.D., was a member of the Virtual Expert Panel on Outreach Education and Knowledge Dissemination for the Global Health Delivery Project at Harvard University in June of 2015.

Henry and Carleen Tufo Chair in General Internal Medicine BENJAMIN LITZENBERG, M.D., became an item writer for the National Board of Medical Examiners Clinical Research Professional Examination.

JOHANNES NUNNINK, M.D., associate professor in the Division of Hematology/Oncology, is serving a four-year term on the American Society of Clinical Oncology (ASCO) Board of Directors. He also joined the clinical practice guideline committee of ASCO — board liaison, as well as the Strategic Development Committee of the Board of Directors of ASCO.

RENEE STAPLETON, M.D., PH.D., associate professor in the Division of Pulmonary Disease and Critical Care Medicine, was elected as Chair-Elect (2015-2016) and then Chair (2016-2017) of the American Thoracic Society (ATS) Critical Care Assembly Program Committee.

In the Media

MAJID SADIGH, M.D., associate professor of medicine and director of the UVM/WCHN Global Health Program, was interviewed in the Danbury News-Times and the Greenwich Time about the global health program, which sends physicians and medical students on rotations to partner institutions around the world.

PETER SPECTOR, M.D., a professor in the Division of Cardiovascular Medicine, was featured in the July 1, 2015, issue of Seven Days discussing his advancing research on a new treatment for atrial fibrillation, a common heart rhythm irregularity.

An article and online video in the September 3, 2015, issue of the Burlington Free Press explored the research and technology behind an algae-based lung sealant developed by DANIEL WEISS, M.D., PH.D., professor in the Division of Pulmonary Disease and Critical Care Medicine, and Rachael Oldinski, Ph.D., UVM assistant professor of mechanical engineering.

KIM DITTUS, M.D., (at right, below), assistant professor in the Division of Hematology/Oncology, won a bronze medal at the International Dragon Boat Federation World Championship, held in Welland, Ontario, in August of 2015. She competed on the women’s Senior B team for those between the ages of 50 and 60 after a competitive try-out process and various training camps with the National team, according to the Shelburne News. Dittus told the paper a patient of hers urged her to participate in 2011, and she’s been on the water even since.