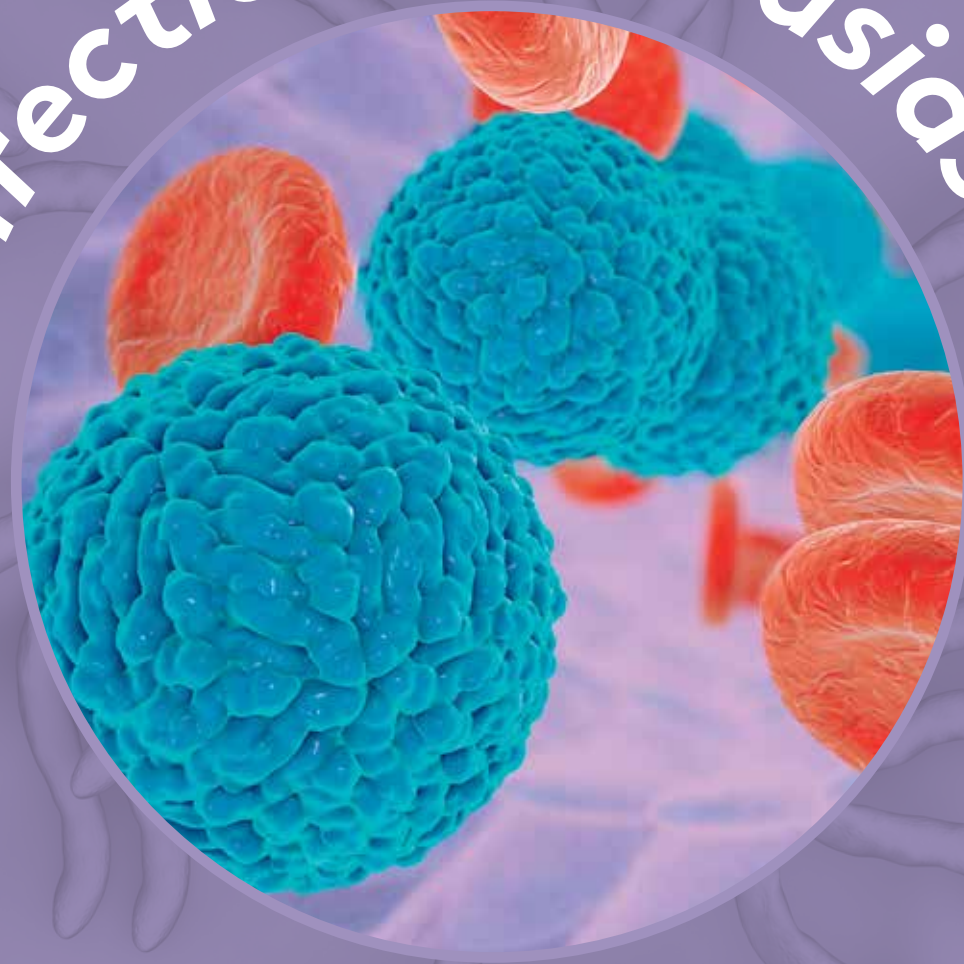


Infectious Enthusiasm



A love of both art and science led Bobbi Pritt, M.D.'01 to her career as an authority on parasitology

By Carolyn Shapiro



It was love at first sight.

Bobbi Pritt, M.D.'01, was drawn to pathology the minute she looked through a microscope at slides of human tissue. “I thought they were just beautiful,” Pritt recalls today. “In tissue pathology, we use all these stains. So there were these brilliant pinks and purples, blues, reds—beautiful colors—and I thought it was very pretty. I liked the structure of the tissue. It kind of got back to my artistic side, I guess. It’s a very visual field.”

It might seem odd that a woman of science — and one of the foremost experts in parasites and diseases carried by ticks and mosquitoes — would highlight the visual artistry of her field over the technical aspects. Pritt, though, has taken a unique approach to medicine from the start and a somewhat circuitous route to her successful career.

A pathologist and microbiologist who graduated from the Larner College of Medicine in 2001, Pritt is now director of the Clinical Parasitology Laboratory and co-director of Vector-Borne Diseases Laboratory Services at Mayo Clinic in Rochester, Minn. Mayo’s lab is among the largest clinical parasitology laboratories in the world, serving as an international reference center, and testing patient specimens from all 50 states and across the globe.

Pritt’s early interest in art threads throughout her career trajectory. It spurs her imaginative outlook, innate curiosity and hunger for discovery.

In the past decade, Pritt has gained international recognition for leading teams that found two never-before-identified bacterial organisms carried by ticks that sickened patients in Wisconsin and Minnesota. These pathogens differ from the one that’s best known as the source of Lyme disease, *Borrelia burgdorferi*, the most common tick-transmitted bacteria in the United States.

The discovery of these new organisms began with a little boy who presented at the Mayo Clinic; physicians couldn’t figure out why he was so sick. They ordered several tests, including a specialized assay that Pritt offered in her lab to distinguish between different species of bacteria. Unexpectedly, the test came back positive with an unusual result. This prompted Pritt to investigate further; within two months, state health



departments and the federal Centers for Disease Control helped identify five more patients who had the same organism. This team of investigators eventually proved that the patients were sick from a new organism, which was named *Borrelia mayonii* in honor of the Mayo brothers who founded Mayo Clinic. The buzz around this latest discovery, described in a paper in *The Lancet Infectious Diseases* in 2016, spurred further investigations by other labs. Commercial developers contacted Pritt to see if their tests could detect the new culprit, which fortunately responds to the same drug to treat Lyme, doxycycline.

“That was the goal,” Pritt says. “We wanted to get the news out there so that people knew about it, so that physicians would think of it when they were seeing patients that were sick with something and they didn’t know what the patients had.”

Christopher Paddock, M.D., a pathologist and rickettsiologist who also specializes in tick-borne diseases at the CDC in Atlanta, knew of Pritt and her work before he met her in person in 2011 on the way to a conference they were both attending in Greece, where she presented the findings on the first discovered organism, *Ehrlichia muris eauclairensis*. She has since collaborated frequently with Paddock, and her eagerness to share samples and information is critical, he says.

“Her background and interest are exceptionally important in terms of her discovery of new agents,” Paddock says. “There’s just not a lot of expertise out there, and she’s one of the few people who has that expertise.” Paddock is a member of the department that published with Pritt on the new *Ehrlichia* organism in the *New England Journal of Medicine*. >>

Pritt thrives on the constant variability of her work. Besides overseeing her labs, she teaches and publishes. She communicates with colleagues all over the world about new pathogens, new methods to detect them and new places getting diseases they hadn't seen before, such as the Latin American outbreak of Zika virus — previously seen primarily in Africa.

She keeps a close watch on other mosquito-borne infections such as dengue fever, malaria, yellow fever and chikungunya. And occasionally she serves as an expert on nasty topics such as parasite worms found in fish, as she did for a recent story in the *Washington Post*.

Pritt often needs to develop tests that don't exist to identify ailments that pop up in patients, as she's doing now for Zika.

"If there aren't good tests on the market, then we have to develop them ourselves," she explains. A center like Mayo Clinic provides the volume of examples necessary to maintain expertise in these disease, Pritt says.

"Every week we get positive cases of malaria," she says. "And if you go to a smaller place, they may only get a case of malaria every year or so, every two years or every three years. It's hard to maintain a level of expertise in something you see only every two years or every three years."

Pritt's work grows more important with the wider geographic spread of ticks. The same tick can carry more than one infection, some more dangerous than Lyme.

At the same time, diseases rarely seen before in this country are showing up more frequently. Foreign-born immigrants in the United States lose their immunity to diseases common in their home countries. When they travel overseas to visit relatives, usually in Africa and Asia, they are susceptible to picking up illnesses — botfly larvae embedded in the skin, for example — and bringing them back to the States.

"I love that it always comes back to patient care," says Pritt, who doesn't actually treat the botfly-infected patients. "But I'm on the phone with their physician, and I'm telling them what this is and what the risks are and talking about the different testing options and what we can do from a laboratory standpoint to help the patient. So I'm reminded every day of why I'm here."

In 2007, Pritt launched a blog called "Creepy Dreadful Wonderful Parasites," which now averages 25,000 page views per month. Every week, she posts a case involving some kind of icky creature and invites her readers to guess what it is, giving them the answer at the end of the week.

This summer, she posted her 500th episode with a celebration: a montage of artistic renditions of parasites submitted by

readers. They included parasite-decorated cakes, parasite-decorated Easter eggs, parasite Halloween costumes, a crocheted parasite on a red blood cell, and even a song entitled "Home in the Gut," to the tune of "Home on the Range."

Pritt uses a range of social media to reach her audience, mostly fellow scientists and educators who often use her cases in classrooms. Her regular visitors will often discuss with each other and trade ideas.

"Probably one of my professional accomplishments I'm most proud of is creating this awesome little community of people who write in every week and read my cases," Pritt says. "I've met all these people from all around the world that share a common interest."

In 2016, Pritt won an Early Achievement Award from the UVM Medical Alumni Association, recognizing physicians early in their careers for outstanding academic contributions through community or medical service.

"In the field of microbiology, Bobbi is a rock star," says Bruce MacPherson, M.D.'67, UVM professor emeritus of pathology and laboratory medicine, citing the words of one of Pritt's fellow pathology residents at UVM.

"Bobbi is a great example of somebody who finds a field that really excites her, and she's been wildly successful in that field as a result," says MacPherson, who mentored Pritt in residency.

Pritt, though, did not follow a smooth and steady path into and through medical school. She took several detours.

She grew up in West Enosburg Falls, Vt., in a rural landscape close to Canada. She played outdoors and showed an early hint of her inclination toward creepy creatures when, at age 4, she found a nest of baby milk snakes and stuffed them into the front pocket of her hooded sweatshirt. Her father swatted them away.

She was a good student, she says, but never a "science geek." Pritt was artsy. She liked to paint in watercolors and pastels but didn't like the idea of a job in graphic design.

When she was 14, Pritt's father got a new job and moved the family to the suburbs of Albany, N.Y. He was an electrician, and Pritt's mother was a secretary who worked her way up to the position of office manager. Neither went to college. They didn't know how to guide her, and career counseling was nonexistent in schools back then, Pritt says, so she had to figure things out on her own.

After high school, she enrolled at Hudson Valley Community College in Troy, N.Y. She changed her major 10 times and ended up with two associate's degrees: in business

A Community of Passionate Parasitologists

Navigate to Creepy, Dreadful, Wonderful Parasites — Bobbi Pritt's long-standing blog — and every week you'll find a conversation about an unidentified organism that lives up to the blog's name in any number of ways. Pritt posts a photo, and readers from around the world weigh in on what the parasite-in-question may be. The conversation is often lively and detailed, and there's a familiarity to the exchanges. Some readers banter back and forth like old friends. Pritt has cultivated this community of passionate parasitologists and eager microbiologists for over 10 years; she recently surpassed 500 "Cases of



A striking image of what was determined by the blog community to be *Demodex folliculorum*, the follicle mite.

the Week," with some posts generating upwards of 20 comments. A searchable archive dates back to 2007, allowing readers to take a deep dive into puzzling cases. In posting the answer for each Case of the Week, Pritt often offers detailed information about the organism, providing important learning opportunities for students, parasitologists and curious readers.

Read more and take a guess on the Case of the Week: <http://parasitewonders.blogspot.com/>

administration; and in math and science.

Resurrecting a longtime interest in biology, she continued as a biology major at the State University of New York at Geneseo, with a minor in anthropology. Then, with her bachelor's degree in hand, Pritt saw only two options: medical school or a doctorate.

She feared academia would force her into too narrow a focus of study, Pritt says. She wanted to look at the big picture and put her knowledge to use.

She applied to 11 medical schools and interviewed at seven. She was drawn to Burlington,

even though she had almost no sleep before her interview there; she had just finished a night shift as a pathology lab technician at a hospital in Albany, where she also worked a second job as an administrative assistant.

"University of Vermont, for me, really stood out as being such an open, friendly school," she says. "When I went there, I loved the atmosphere. It just seemed so inviting."

Even so, Pritt struggled with doubts. One day, during her surgical rotation in her second year, she suddenly froze with the retractor in hand, then walked out. She took two months off but, after returning, decided to withdraw from medical school. It was only later, Pritt says she came to understand she suffered from depression and got treatment.

For two years, she re-evaluated. She worked as an administrative assistant in UVM's sociology department and took a variety of classes for free as an employee. Most important, she says, she spent time doing "informational interviews" with anyone who had a job that intrigued her, including a nutritionist and the state epidemiologist.

For those roles she liked, she concluded, "I'd have a lot more opportunities if I had my medical degree."

UVM allowed her to re-apply and accepted her back. She says she was grateful for the second chance. "That was the total game-changer," Pritt says. "I had finally done my research and spoken to enough people that I got really good information, and I had the focus of what I wanted to do."

Today, Pritt speaks frequently to students about their career plans, not only while teaching but serving as a mentor to dozens of students. She will readily answer questions about her work and encourages students to explore a range of jobs by talking to those doing them.

For her residency in pathology, Pritt matched to UVM. Pathology crossed all areas of medicine, giving her that big picture. It wouldn't involve much direct contact with patients, but Pritt says she has found as much reward in the educational interaction with students.

"She stood out as an incredible, kind person, and someone who just wanted to learn and wanted to be innovative and move things along," says Pam Gibson, M.D.'89, associate professor of pathology and laboratory medicine at UVM.

Those qualities make for a good pathologist, Gibson adds. "You've got to be able to love that inquiry, that questioning, and then want to share."

Influenced by now-deceased UVM professor Washington Winn, M.D., Pritt was especially drawn to microbiology, the study of all things infectious: bacteria, viruses,



Bobbi Pritt, M.D.'01, receives the 2016 UVM Medical Alumni Association Early Achievement Award from Dean Rick Morin, M.D. (at left), and Marga Sproul, M.D.'76.

“IN THE FIELD OF MICROBIOLOGY, BOBBI IS A ROCK STAR.”

— BRUCE MACPHERSON, M.D.

parasites and fungi.

From her residency, Pritt went to Mayo Clinic for a one-year fellowship in clinical microbiology. As she looked for her first job, Mayo made her a hard-to-resist offer: Go to the London School of Hygiene and Tropical Medicine to get a master's degree in parasitology, then return to Minnesota to run the lab.

So Pritt, who had just gotten married, moved with her husband to London to pursue this uncommon specialty at one of the world's premier programs on the subject. There, she gained a global perspective, not only on parasites found elsewhere in the world — such as guinea worm — but also on the need to understand cultural differences in communities where these infections flourish.

Even after becoming enmeshed in medicine, Pritt has found artistic outlets — many of them related to her work. Gibson remembers Pritt identifying the herringbone pattern seen in certain tumors and creating photo montages of cell formations to help residents identify them.

MacPherson once went to dinner with his wife at Daily Planet, a downtown Burlington eatery, and noticed an exhibition of Pritt's

abstract-looking photographs, which only a pathologist would recognize as stained cell and tissue samples.

Pritt is now working on a parasite coloring book. While traveling, she noticed adult coloring books in the airport and enjoyed filling in the designs.

She thought to herself, "Instead of this beautiful field of flowers, what if it was a field of flowers with ticks on it? Or instead of a tunnel, you're looking up an intestine, like your colon, and there's worms hanging off the inside of it?" she says. "There's an 'eww' factor but it also could be educational and kind of fun."

The coloring book illustrates Pritt's artistic nature and, even more, her never-ending effort to inspire and teach, to turn others on to her fascination with parasites. That's not to say she likes them outside the lab.

"I find them scientifically fascinating, but I hate mosquitos and ticks," she says. "I really do."

Scientists need to work together to prevent the illnesses those bugs carry, Pritt says. So the more she can discover, the more she can collaborate, the more she can convey through art or other means, the better off the world will be. **VM**