Adirondack researchers aid the fight against COVID-19

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Dr. Priya Luthra, a molecular virologist at the Trudeau Institute, works on finding therapies for emerging diseases including COVID-19. Photo by Mike Lynch

Trudeau Institute in Saranac Lake builds on its legacy to beat a new threat

By Tim Rowland

Describing the storied historical arc of the Trudeau Institute to a reunion of alumni last summer, President and Director Atsuo Kuki used a word that usually gives scientists hives.

“Magical.”
Certainly there were magical elements to the Trudeau Institute’s legacy, both in terms of scientific accomplishment and Adirondack mystique, but at the time even Kuki himself didn’t know the half of it. A highly infectious virus was about to change everything.

Some in the audience that day had experienced the institute’s darkest hours earlier in the decade, when federal funding was becoming scarce, top scientists were departing and the board was said to be listening to offers of relocation from other states licking their chops at the prestige the Trudeau name would bring to their research centers.

But over the past five years, the board brought the institute back from the brink. It redoubled its effort not only to keep the legacy alive but to make Trudeau more relevant in the world of infectious disease, partnering with pharmaceutical companies, the government and academia to develop drugs and vaccines.

So when COVID-19 began to spread earlier this year, Trudeau was already familiar to these groups, which were suddenly in desperate need of testing or help in the search for vaccines and treatments. Now, Trudeau is either leading or has been asked to participate in multiple projects specific to coronavirus research. It has responded to the pandemic locally and on a global level and expects to remain an important player, executives say.

Trudeau’s academic partners include the State University of New York Upstate Medical University; Albert Einstein College of Medicine; Icahn School of Medicine at Mount Sinai; La Jolla Institute for Immunology; and Texas Biomedical Research Institute, Kuki said. The institute can’t divulge its private contracts but says they cover work with major international biopharma companies, including with drug discovery, vaccine technology and biotech firms in Boston, San Francisco and New York State.

The Trudeau Institute campus on Lower Saranac Lake. Photo courtesy of Trudeau Institute
Rowboat persuasion

It almost didn’t happen that way. For Trudeau to be a player on the world stage, it needed a new funding model, one not dependent on the old-school research grants from the National Institutes of Health, which were disappearing with disturbing speed. The institute would need to venture into the world of “applied” science, another word that elicits grunts from the purists who believe in research for the sake of research.

In 2016 Trudeau hired Kuki, who was recruited in the singularly Adirondack way of being rowed around a lake by Trudeau Institute champions Lee and Nancy Keet. Serendipity perhaps, but it was in such a boat on such a lake that the institute’s founder was rowed back to health while in the throes of consumption in the early 1870s. In 2015 though, it was the institution itself that needed healing.

Kuki calls his background a “blend,” which is shorthand for being conversant in the worlds of biotech, international pharmaceutical companies and government research. It was these connections with the outside world writ large that would quickly have an impact.

In October of 2018, Kuki brought a formidable panel to Trudeau for a summit on infectious diseases. Among the attendees were Cristina Cassetti, deputy director of the National Institutes of Health’s Division of Microbiology and Infectious Diseases; Jerome Kim, director general of the International Vaccine Institute in South Korea; Melanie Saville, director of vaccine development at Coalition for Epidemic Preparedness Innovations in the United Kingdom; and Stephen Thomas, a virologist, vaccinologist and chief of infectious disease at SUNY Upstate.

These were experts with serious cred. Kim had been in Seoul during a 2015 outbreak of MERS—Middle East respiratory syndrome. Thomas had battled Ebola in Africa. At the summit, some 40 invitees mused, talked, posited and argued over the best way to keep the public safe from deadly microbes. On two prophetic things, they agreed: A pandemic was inevitable, and the number of deaths attributable to said pandemic would directly correspond to how well, or how poorly, the world was prepared.

“Trudeau put itself on the map with this event,” Kuki said. “We are remote, but relevant.”

Fewer than 14 months after the conference broke up, the first known case of COVID-19 was detected in Wuhan, China. Six months after that, Kuki was thinking back on the summit, convinced that if the team that had been assembled at Trudeau had been in charge, the face of the pandemic would have looked vastly different.
Meantime, there had been a third thing summit attendees agreed upon. They all fell in love with Saranac Lake … just as Kuki had hoped.

To die for

Edward Livingston Trudeau came to the Adirondacks to die. It was one of the few endeavors at which he did not succeed. Named for a New York politician who coincidentally enough was hailed for his courageous battle against an outbreak of yellow fever, Trudeau, fresh out of medical school, had been diagnosed with consumption in 1873, the year of the Great Panic, which touched off an economic malaise that for the next 20 years would make dirty, congested city life even more miserable than it already was. Tuberculosis patients who could afford it were advised to leave the cities, which is what Trudeau did. Guides at Paul Smith’s Hotel, who reportedly said the emaciated doctor “didn’t weigh no more than a lambskin,” bundled him up and nested him in a boat filled with fragrant evergreens and gently rowed him off into the blue. There were worse ways to go.

“He was kind of looking for a peaceful place to die, but he came here and got better,” said Amy Catania, executive director of Historic Saranac Lake at the Saranac Laboratory Museum.

Trudeau was certainly sold on the healing qualities of the Adirondacks. He moved his family to Saranac Lake and became a disciple of the “rest cure,” which called for lots of clear and cold air, proper nutrition and as much exercise as the patient could handle. He built a neighborhood of cottages and every year a fortunate few (relatively speaking) underprivileged TB patients were plucked from their coal-blackened city life and set down in a wonderland of snowy mountains, pure air and crystalline waters. “The interesting thing was how effective it was,” Catania said. In a world before antibiotics, brisk mountain air seemed to be the next best thing.
People took notice. Less than 10 years after Trudeau founded the Adirondack Cottage Sanitorium, the state of New York created the Adirondack Park, with health among the reasons. Along with the sanatorium, Trudeau founded the first U.S. laboratory dedicated to the study of tuberculosis, a seedling that, through Trudeau’s grandson, would grow into the Trudeau Institute on the shores of Lower Saranac Lake. It was a small operation in a small community a million miles from anywhere, but with a mission of enormous global consequence.

When Trudeau was doing his work, TB was a rampant killer aided by the nation’s new urban density. By the early 20th century, science knew enough to warn people to mask their mouths when they coughed and be judicious about the direction in which they spit their tobacco. Trudeau, who died in 1915, would not live to see a cure, but his famous experiment with rabbits showed that foul conditions alone did not cause TB, but suggested that healthy conditions slowed its advance.

A ‘cottage industry’

As the years passed, Trudeau became to Saranac Lake what Walt Disney would be to Anaheim or Orlando. His sanatorium grew to the size of a small town in and of itself—more than 50 buildings, including cure cottages, research facilities, infirmaries, dining halls, barns, maintenance sheds and its own post office, from which recipients would receive mail postmarked “Trudeau, NY.”

His legacy, Catania said, can be seen not just in the Trudeau Institute, but in the very architecture of the village. Those wandering the side streets of Saranac Lake will notice an oddity hidden in plain sight: Many homes have porches all out of proportion to the size of the house, for resting in the fresh air. What could rightly be called a cottage industry—largely run by women—had sprouted up in the town, as many of the “lungers,” as they were known, stayed in Saranac Lake after their recovery and built cure cottages of their own.

Aside from the magic of the mountains, “it was a place where they felt accepted,” Catania said. TB needed not be either a medical or social death sentence.

A single sneeze can send tens of thousands of microscopic moisture specs rocketing across a crowded room. Along for the ride are bacteria (like the one causing TB) and viruses (like the one causing COVID-19).

When the coronavirus that causes COVID-19 made its appearance on the world stage, it was viewed with interest at Trudeau, but there was little indication that before the end of spring, the institute would be on the front lines of a raging pandemic.
“The question came up, what do we see in this for ourselves—but we didn’t really think it would have relevancy,” said Dorothy Federman, chair of the Trudeau Board of Trustees. “A month later our phones were ringing off the hook.”

Trudeau had restocked its toolbox with the materials that the world health field was clamoring for the most—a secure lab, expertise and even its own locally sourced mice. The shift from pure research to translational science—taking laboratory observations and putting them to use in the real world— mattered to pharmaceutical companies that needed help developing drugs and vaccines.

“It was utterly different from the way we used to be,” Federman said. “We were nimble and capable of doing almost anything. (Kuki) positioned us to respond to this moment.”

“Everything in the history of Trudeau is being adapted to fight this pandemic,” Kuki said.

Trudeau researches other infectious diseases, such as Zika and Lyme. Tuberculosis has not gone away; it’s still a leading cause of death in the world. But when COVID accelerated, other research was back-burnered as Trudeau scientists teamed with biotech and pharmaceutical companies in the search for vaccines or treatments that, in an epic war at the cellular level, could tip the scales in favor of the good guys. “We have high-quality partners, and some of the things we’re working on will go into clinical trials,” Kuki said.

It is popular to talk about “a vaccine” against COVID, but one size does not fit all. There will be many vaccines to come, and a great likelihood that some will be built in part on the research done at Trudeau.

Men recline on a cure porch during Saranac Lake’s tuberculosis heyday. (Photo courtesy of Historic Saranac Lake Collection)
But there was more to the Trudeau response, which channeled the days when the foundation’s patriarch was keenly involved in the well-being of the community. Like other parts of the country, Saranac Lake and the North Country as a whole were pitifully short of basic masks and testing supplies, two areas where Trudeau was in perfect position to help. The institute knew how to sanitize masks so they could be reused by the Adirondack Health network, and it knew how to produce testing fluids.

As the state of New York was demanding a significant level of testing as a condition for economic reopening, the North Country for a few crucial days looked incapable of meeting the standard—until Trudeau stepped in with thousands of units of a key fluid needed to facilitate the tests.

Adirondack Health was able to substantially ramp up its testing, and the North Country economy was able to begin its phased reopening. It was a rapid and hyper-local response that the pure research facility of old might not have attempted. Times at Trudeau were indeed changing.

**Trudeau 3.0**

It’s not called Big Pharma for nothing. Kuki, whose resume includes a stint as a Pfizer executive, said the sheer size of the labs at drug companies, biotech firms and research universities such as Stanford and their—to a scientist—Mouth-watering array of equipment and computers of mind-blowing power, give these institutions an obvious edge.

Pfizer has 88,000 employees. At its 2016 nadir, Trudeau Institute employed 44 (though it rebounded to 59 last year and is still hiring). To succeed, Trudeau needed to find its place in such an industrial monolith. “We must find a fundamental dynamic that allows us to move forward in a competitive way,” Kuki said.

Kuki calls the era of Edward Livingston Trudeau “Trudeau 1.0.” In the 1960s, Trudeau’s grandson Frank shepherded a new era—after antibiotics made the cure cottages obsolete—called Trudeau 2.0, which saw it become a flourishing research facility credited with major breakthroughs in understanding of what causes our immune systems to either leap into the heat of battle or remain passively on the sidelines. Despite these successes, from a funding standpoint Trudeau’s strengths were too theoretical for a results-oriented society.

Trudeau 3.0 shifts gears in favor of applications that earn money in the modern world, but it does something else, too. It celebrates its small size, the stunning backdrop of the Adirondacks and its incredible backstory that grew from one man, thought destined to die, into a world-renowned research center.
As he was paddling around the lake with the Keets, Kuki was struck with the surroundings, and he knew others would be as well. “(Trudeau has) a beautiful history, a beautiful location—it is beautiful in so many senses of the word.”

The unique nature of Trudeau was not lost on the all-star panel assembled in October 2018, which, after careers of slavish connectivity, were even charmed by the lousy cell phone service. “They loved coming here,” Kuki said. “They got it, the tranquility and the beauty and the opportunity for reflection—and reflect they did.”