

## NEWS

### IMAGINE

# A toxin shows promise in fight against blood cancers

**By MaryLynn Schiavi**  
For the Home News Tribune

*This monthly column explores ideas, insights and discoveries made in New Jersey that are shaping our future.*

When Dr. Scott Kachlany was still a graduate student at Columbia University in 2000, he anticipated that his work in microbiology would remain largely in the lab.

At the time, he said he never imagined that the toxin he was working on would prove to be a successful therapy for leukemia and dozens of autoimmune diseases, but now he does.

What he and his fellow researchers were exploring was a natural bacterial toxin called Leukotoxin, found in the mouths of some mammals, which has proven to destroy “activated” white blood cells, instead of all white blood cells, according to Kachlany.

“The beauty of this toxin is that it only attacks diseased white blood cells and leaves the healthy ones alone. So it works in a very targeted way,” he said.

He said the toxin could not only be used to treat blood cancers, such as leukemia and lymphoma, it also holds the promise of treating about 80 autoimmune diseases as well, because the receptor for Leukotoxin — called LFA-1 — is present in higher amounts on white blood cells responsible for blood cancers as well as autoimmune diseases.

Abnormally high amounts of LFA-1 on the surface of white blood cells “label” or “mark” the cells as diseased.

“This is a remedy that has been given to us by nature itself, and this makes it especially exciting,” he said.

While the initial work began while he was still at Columbia, it wasn’t until he was hired as an assistant professor of oral biology, microbiology and molecular genetics at University of Medicine and Dentistry of New Jersey (UMDNJ), that he began to imagine the far-reaching possibilities for the toxin.

He put its therapeutic powers to the test, first with mice injected with



Microbiologist Scott Kachlany is the founder of North Brunswick-based Actinobac Biomed, which is developing a therapy to treat leukemia and other diseases with a bacterial toxin found in the mouths of some mammals. COURTESY OF SCOTT KACHLANY

leukemia. What he found astonished him. They were cured. The results were equally exciting when tested in a mouse model for human psoriasis. He said the best part was that there was no evidence of side effects.

In 2009, Kachlany established his own company, the North Brunswick-based Actinobac Biomed, which has exclusive rights to the therapeutic use of Leukotoxin, registered as Leukothera through a license from UMDNJ.

To date, Leukothera has shown promising results in mice, dogs, and monkeys.

In February of this year, Dr. George F. Heinrich, vice chair and chief executive officer of Foundation Venture Capital Group (FVCG), announced his company’s commitment to a second investment of \$100,000 in Actinobac Biomed, to study the efficacy of Leukothera in the treatment of veterinary white blood cell diseases.

Kachlany’s company has already begun working with Texas A&M Veterinary School to examine the use of Leukothera

for dogs suffering with white blood cell diseases.

“Because of biological similarities, the data we obtain from these new studies will be applicable to dogs and support drug development for human applications as well,” he said.

Foundation Venture Capital Group originally invested \$500,000 when Actinobac was established to develop pharmaceutical agents for the treatment of hematologic malignancies such as leukemias and lymphomas, latent infections such as HIV/AIDS and tuberculosis, and autoimmune diseases including: rheumatoid arthritis, multiple sclerosis, Crohn’s disease, type 1 diabetes, Lupus & psoriasis.

Foundation Venture Capital Group is an affiliate of New Jersey Health Foundation, which invests in commercially viable new start-up companies developing technology by faculty at or affiliated with the University of Medicine and Dentistry of New Jersey. Foundation Venture’s portfolio companies are working on therapies for a wide range of diseases that include: cancer, chronic spinal cord injuries, and neurodegenerative diseases.

“We are excited about Dr. Kachlany’s results to date and we are hopeful that Actinobac’s work will provide a viable treatment in the not too distant future to increase survival rates for these white blood cell diseases,” said James M. Golubieski, president, Foundation Venture Capital Group.

According to Kachlany, human clinical trials could begin in two years, but would require another \$2 million in funding.

“Being a microbiologist, I considered myself to be a basic scientist, so generally your work is confined to the lab and you don’t usually think about where it can go in the future,” Kachlany said.

But now, the possibility that his discovery could make it from the bench to the bedside is exciting and gratifying.

“I hope that one day I can walk into a hospital or clinic and see that something that I developed in the lab is actually changing someone’s life for the better,” he said.