The Bone and Cancer Foundation Awards First Noa Schwartz Siris Research Grant to Pierrick G. Fournier, PhD

Pierrick G. Fournier, Ph.D., an Instructor at the University of Virginia, is the recipient of the first Bone and Cancer Foundation Noa Schwartz Siris Research Award. Dr. Fournier won the grant for his research project entitled, “T Cell in Bone Metastases and Role of the Bone Microenvironment.”

"Receiving the first Noa Schwartz Siris Research Award is a great honor. As a young investigator, this award will help me in my scientific career to become an independent investigator. It will also allow me to initiate this exciting project on the interactions between the immune system and cancer cells in bone metastases, which, I hope, will lead to new treatments for patients and render bone metastases curable," Dr. Fournier stated.

The Noa Schwartz Siris Award was created to fund basic or clinical research on bone metastasis and osteoscaroma. It was named in memory of Noa Schwartz Siris, a physician who died of osteosarcoma at the age of 29. She was the daughter-in-law of Dr. Ethel Siris a long-time member of the Paget Foundation Board of Directors.

Dr. Fournier has an impressive background in biochemistry and microbiology. He received his Ph.D. in 2005 from the University Claude Bernard, in Lyon, France; at University H. Poincare he earned his degrees as an Engineer (specializing in Microbiology and Enzymology) in 2000; an M.Sc. in Biochemistry in 1999 and B.Sc. in Biochemistry in 1998.

He became a Research Associate at the University of Virginia, Charlottesville, in the Division of Endocrinology and Metabolism in 2005, where his project was entitled “TGF-ß (Transforming Growth Factor) induced Genes and their role in Prostate Cancer Bone Metastases” under the mentorship of Dr. Theresa A. Guise. He went on to become an Instructor of Research where his project is "Molecular Mechanisms of Bone Metastases, Role of TGF-ß and the Immune System in Bone Metastases”.

His work has been published in several prestigious journals and he is the recipient of three previous awards: the AIMM-ASBMR John Haddad Young Investigator Award; the Young Investigator Award from the American Society for Bone and Mineral Research; and the New Investigator Award from the British Bone and Tooth Society.

An explanation of his research project by Dr. Fournier.

Metastasis is considered to be the final step of cancer: Cancer cells detach from the primary tumor and disseminate throughout the body. Bone is a frequent site of metastasis from breast cancer, prostate cancer and from melanoma. Cancer cells colonizing in bone produce factors that disrupt normal bone remodeling, causing an excess in bone resorption and/or bone formation. In turn the microenvironment of the bone changes the behavior of the metastatic tumor cells and promotes their growth. Cancer cell growth and bone remodeling sustain each other in a phenomenon called the *vicious cycle of bone metastases*, which makes skeletal metastases resistant to treatment.

A better understanding of bone metastasis mechanisms is required to design new and more effective therapies. Among the potential actors at sites of bone metastases are the *lymphocytes T* or *T cells* of the immune system, which have received little attention in the bone metastases field. Cancer cells should be a target of the immune system. However, they are often able to evade the immune response using different means such as the secretion of immunosuppressive factors including the *Transforming Growth Factor* -ß (TGF-ß). TGF-ß is one of the most abundant growth factors in bone where it is produced by the bone cells known as osteoblasts, stored in the bone matrix and released during bone resorption. TGF-ß in bone activates cancer cells promoting bone metastases, it is likely that TGF-β derived from bone will also protect cancer cells from the immune system. Under pathological conditions T cells can also increase bone resorption, which, at sites of bone metastases, could indirectly promote the growth of cancer cells.

We hypothesize that T cells will favor the development of bone metastases by increasing bone resorption and also that TGF-ß derived from bone, acting on T cells, will help cancer cells evade the immune system. Therefore, our research focuses on characterizing the role of T cells during cancer metastases to bone, as well as testing anti TGF-ß therapies in preclinical models of bone metastases. Such treatments might have important therapeutic significance for patients suffering from bone metastases.

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