

# DMRF CIBC GRADUATE STUDENTSHIPS

IN CANCER IMMUNOTHERAPIES

COVER STORY



Back LR: Daniel Medina-Luna, Dr. Andrew P. Makrigiannis, Youra Kim  
Front LR: Sarah Schwartz, Dr. Jeanette Boudreau and Dr. Shashi Gujar



As a world-leader in immunotherapy research, Dalhousie is consistently pushing the envelope with the development of innovative solutions aimed at defeating cancer. Immunotherapy is the field of immunology that aims to identify treatments for diseases through enhancement, inhibition or redirection of an immune response. Immunotherapies have emerged as potent new therapies in recent years and are transforming the treatment of numerous diseases. With this team of determined Dalhousie researchers growing rapidly in recent years, the need for funding support in pursuit of this important work has also grown substantially.

Cancer remains the leading cause of premature death in Canada, with statistics showing about 1 in 2 people developing the disease, and 1 in 4 dying from it. Immunotherapies have revolutionized the treatment of many cancers and saved thousands of lives. In fact, the 2018 Nobel Prize in Physiology or Medicine was awarded to James P. Allison and Tasuku Honjo for their discovery of cancer therapy by inhibition of negative immune regulation.

This year, we are proud to support three graduate studentships at Dalhousie in this area of research, thanks to a generous gift of \$50,000 provided by CIBC and an additional \$10,000 contributed by DMRF donors.

Recognized for their outstanding work in cancer immunotherapy, Dalhousie's Daniel Medina-Luna, Youra Kim and Sarah Schwartz are all pursuing promising research in this area, thanks to the generosity of CIBC and DMRF donors

“With CIBC’s community investment initiatives focused on the cancer cause, we are pleased to make this contribution toward cancer research, with an ultimate goal of no one having to fear a cancer diagnosis. This disease continues to be the leading cause of premature death in Canada and we are pleased to support Dalhousie’s reputation as an internationally acclaimed research centre for treatment and, ultimately, cures.”

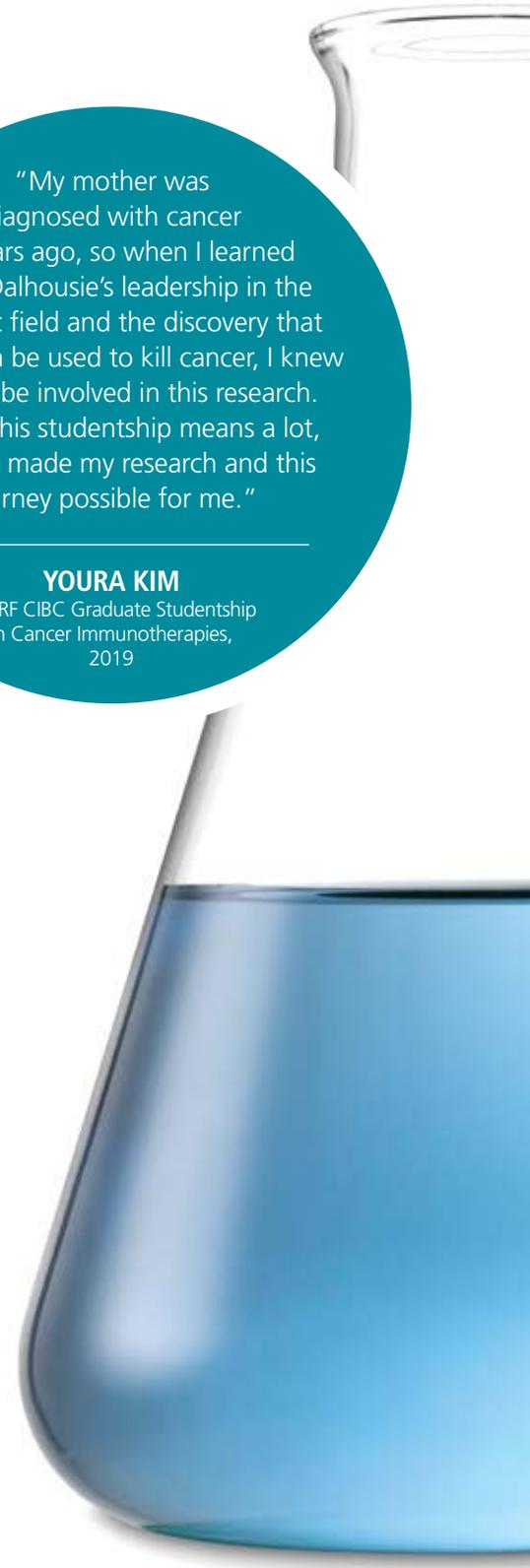
– MIKE BAGNALL

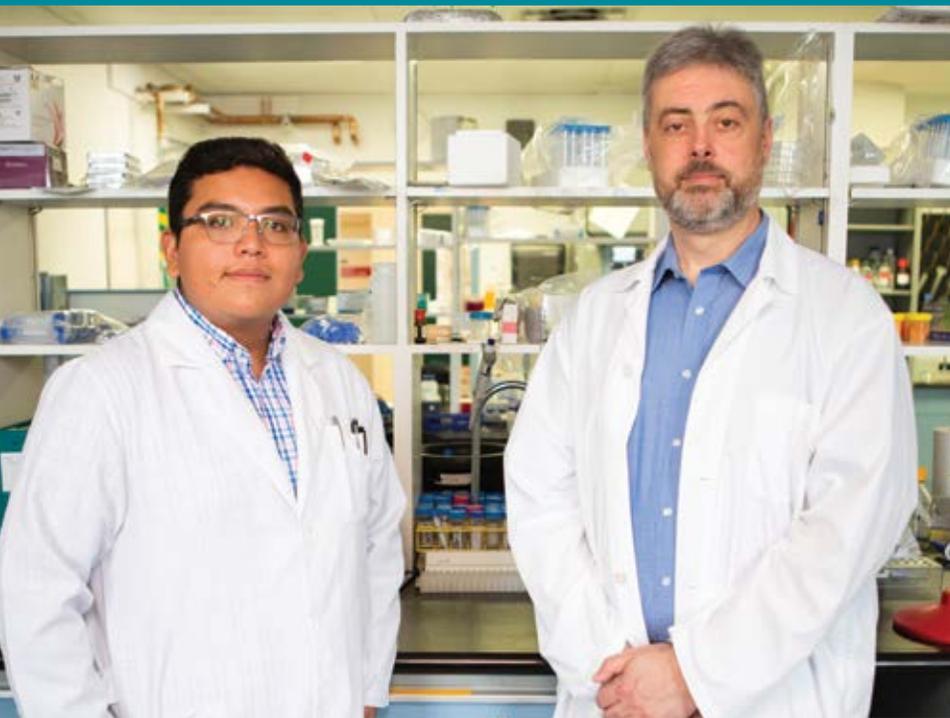
Vice-President and Region Head of CIBC Commercial Banking Atlantic

“My mother was diagnosed with cancer 19 years ago, so when I learned about Dalhousie’s leadership in the oncolytic field and the discovery that viruses can be used to kill cancer, I knew I had to be involved in this research. Having this studentship means a lot, as it has made my research and this journey possible for me.”

**YOURA KIM**

DMRF CIBC Graduate Studentship  
in Cancer Immunotherapies,  
2019





LR: Daniel Medina-Luna, Dr. Andrew P. Makrigiannis

As part of our immune response as humans, Natural Killer (NK) cells activate in the body to fight things like infections and cancers. The problem, however, is that if these NK cells get over activated, they can also attack healthy cells, with no ability to distinguish them from those of cancer cells. Working to solve this problem, Dalhousie's Daniel Medina-Luna is experimenting with the novel idea that we can train memory in NK cells to be able to identify and only attack cancer cells. Testing this technology with a local biotech company in Dartmouth, Nova Scotia, Daniel's work has the potential to transform NK cells into a more viable defense for cancer, while keeping the rest of the body free from harm.

## DANIEL MEDINA-LUNA MEXICO CITY

### Project Supervisor:

Dr. Andrew P. Makrigiannis,  
Professor & Head,  
Department of Microbiology  
and Immunology,  
Dalhousie University

"This studentship gives me the opportunity to remain in Canada and continue my research, without financial burden. One of my goals in this life is to help people and families affected by cancer. This studentship is supporting me in my work to achieve that goal."

### – DANIEL MEDINA-LUNA

DMRF CIBC Graduate Studentship in Cancer  
Immunotherapies, 2019





## SARAH SCHWARTZ OTTAWA, ON

### Project Supervisor:

Dr. Jeanette Boudreau,  
Assistant Professor, Department  
of Microbiology & Immunology,  
Department of Pathology,  
Dalhousie University



LR: Sarah Schwartz & Dr. Jeanette Boudreau

“I am extremely grateful that I have been able to work on lung cancer research and am thrilled that I will be able to continue thanks to this Studentship. I am very thankful that DMRF and CIBC selected my project, as it will allow me the opportunity to complete impactful research that will hopefully contribute to helping others.”

### – SARAH SCHWARTZ

DMRF CIBC Graduate Studentship in Cancer  
Immunotherapies, 2019

Lung cancer is the leading cause of cancer death in Canada, with non-small cell lung carcinoma (NSCLC) being the most common form. Working to improve the effectiveness of NSCLC treatment, Sarah Schwartz is looking at the role that tumour evolution plays over the course of treatment and the potential of using natural killer (NK) cells for defense. Currently, biopsies are typically done before treatment, and the initial biopsy result helps determine the best treatment option. In alliance with previous research, Sarah has observed that tumour phenotypes can change from one round of treatment to the next, indicating that the original treatment may not be the most effective over time. Her work suggests that regular biopsies following each treatment round can inform more effective treatment, through selective activation of specific NK cells.





LR: Dr. Shashi Gujar & Youra Kim

Reovirus, a benign human virus, is well known for its ability to selectively target and kill cancer cells without harming healthy cells. This selective targeting could make reovirus-based therapy a very effective treatment for cancer with little side effects; however, the human immune system unfortunately identifies reovirus as a pathogen and eliminates it from the body.

While immunosuppressive drugs can be used to weaken the immune system in general, thereby helping reovirus to work, this can cause a host of other complications and undesirable side effects. That's why Youra Kim is working to selectively inhibit reovirus immunity specifically, without inhibiting the rest of the immune system. Through her novel immunomodulatory approach, Youra's work has the potential to turn reovirus-therapy into an effective, safe therapy to fight cancer, without harming the rest of the body.

Youra is also using the latest advanced technologies in mass spectrometry to provide a better understanding of the immune targets against cancer cells. With this understanding, the end goal is to develop vaccines to further enhance the efficacy of reovirus-mediated antitumor immune responses.

## YOURA KIM VANCOUVER, BC

### Project Supervisor:

Dr. Shashi Gujar, Assistant Professor,  
Departments of Pathology, Biology,  
Microbiology & Immunology,  
Dalhousie University

"Youra uses cutting-edge technological advances and is working on developing the next generation of cancer immunotherapies. The DMRF CIBC Graduate Studentship has provided Youra with an opportunity to continue this work in our research laboratory at Dalhousie University".

– DR. SHASHI GUJAR

Supervisor

