

The CRA's 2021 Distinguished Investigator: Dr. Sasha Bernatsky



What was your first thought when you learned that you would receive this award?

I am so grateful!

Why did you become a rheumatologist? What or who influenced you along the way to do so?

When I entered medical school, I did not have the faintest clue that there was a specialty like rheumatology. . . I wanted to be a psychiatrist! But I became captivated by internal medicine; it was so challenging, and I felt that if I conquered internal medicine, I would know everything. Early in my internal medicine training, I did a rotation in rheumatology. This exposed me to some very wonderful people, including Drs. John Thompson and Janet Pope. When I learned more about rheumatology, I found that all the things I liked best about internal medicine were what typified rheumatology: the challenges, the knowledge, and the opportunity to develop long-lasting relationships with patients. My love of rheumatology was strengthened by contact with the wonderful rheumatologists at the Arthritis Centre in Winnipeg, especially Drs. Hani El-Gabalawy, Christine Peschken, and Kiem Oen.

What do you believe are the qualities of a distinguished investigator?

If you look at people like Marvin Fritzier, Paul Fortin, Diane Lacaille, and John Hanly, and so many others, you notice not only that they are brilliant and hard-working, but that they are truly kind people, who really care about others. They are fun to work with. They have a vision beyond themselves, they work to accomplish goals that focus on improving the lives of people with arthritis, lupus, etc. They are determined, but they don't force their own way. They inspire everyone around them. They are great leaders who create opportunities for others.

You have been nominated Principal Investigator (PI) of CAN-AIM, the Canadian Network for Advanced Interdisciplinary Methods for comparative effectiveness research, funded by the Drug Safety and Effectiveness Network (DSEN), a collaboration between the Canadian Institutes of Health Research (CIHR), Health Canada, and other stakeholders. Can you tell us about your work?

DSEN was established to address knowledge gaps on the safety and effectiveness of drugs used in real-world settings in Canada and worldwide, to help regulators, policymakers, healthcare providers and patients. Since 2012, CAN-AIM researchers have collaborated with policymakers in the Marketed Health Products Directorate, the Biologics and Genetic Therapies Directorate, and the Pharmaceutical Policy Division, Office of Pharmaceutical Management at Health Canada's Strategic Policy Branch. We have built bridges with many other stakeholders such as the Canadian Agency for Drugs and Technologies in Health, the Pan-Canadian Pharmaceutical Alliance, and provincial formulary bodies. Our research is based on clinical and population-based cohorts and

administrative data to produce timely answers to queries. Currently, CAN-AIM investigators have created a biologic registry with the intent of providing real-world information comparing the safety and effectiveness of biosimilar drugs versus their originator biologic drugs. This five-year study of adults with inflammatory rheumatic disease or inflammatory bowel disease relies on the work of many investigators, including Denis Choquette, Walter Maksymowych, Gilles Boire, Vivian Bykerk, Robert Inman, Claire Bombardier, Carol Hitchon, Carter Thorne, Claire Barber and many more. For more information, please contact Autumn Neville at autumn.neville@rimuhc.ca or visit canaim.ca.

Can you tell us about your experience with the Systemic Lupus Erythematosus (SLE) International Collaborating Clinics (SLICC) and the Canadian Network for Improved Outcomes in SLE (CaNIOS), as well as your work in co-founding collaborative networks such as the Canadian Rheumatic Administrative Database Network (CANRAD)?

As a rheumatology trainee, I had the great fortune to join CaNIOS, founded by Paul Fortin, who led me to begin post-graduate training in epidemiology. He introduced me to Dr. Ann Clarke, who was co-director (with Christian Pineau) of the McGill University Health Centre (MUHC) Lupus Clinic, originally founded by John Esdaile. At the time, Len and Judy Funk introduced me to the patient group Lupus Canada. Without the CaNIOS network, and the support of Lupus Canada, I wouldn't have been able to begin my epidemiology training; the result was my PhD research on cancer in SLE, a multi-centre effort that brought together SLICC and CaNIOS lupus researchers. This effort ultimately clarified that lupus patients have an increased risk of certain cancers (such as lymphoma) but a decreased risk of others (such as breast). The reasons for this may be multi-factorial: SLICC and CaNIOS investigators have banded together over the years to clarify how drugs might shape this risk. For example, while we saw no clear effect of most lupus drugs on cancer risk, hydroxychloroquine decreased the risk of some cancers, while cyclophosphamide increased it.

Regarding my association with CANRAD, Drs. Claire Bombardier, Diane Lacaille, and Lisa Lix were some of the masterminds behind the Canadian Rheumatic Administrative Database Network. CANRAD first came together as a coalition of researchers linked with policymakers and other stakeholders to produce guideline statements for rheumatic disease research and surveillance using Canadian administrative data. Through the years, it has been funded by the Canadian Arthritis Network, CIHR, and other agencies. The CANRAD network has continued to attract brilliant investigators, like Jessica Widdifield, Carol Hitchon, Lihi Eder, and others, who have greatly increased research capacity in Canada.

Your research on air pollution has been described by Health Canada's Air Quality Assessment Section chief as "the first indication that air pollution could be tied to such a specific disease state, which influenced our thinking about the inflammatory potential of air pollution." Can you describe your research findings in this area and its significance?

I feel very lucky to have been the first researcher to uncover trends linking road-traffic density and fine particulate matter (PM_{2.5}) exposures and systemic autoimmune rheumatic disease prevalence. I was mentored by incredible people like the wonderful Dr. Audrey Smargiassi. The biologic plausibility of links between air pollution and rheumatic disease was supported by our very exciting paper suggesting links between PM_{2.5} levels and anti-DNA antibodies and other key manifestations of SLE. As further "proof of principle," we published a cross-sectional study indicating that industrial emissions of PM_{2.5} and SO₂ correlate with other autoantibodies important in rheumatoid arthritis. To ensure that knowledge from my research is used by policymakers, we collaborate closely with the chief of Air Quality Assessment within the Air Health Effects Division of Health Canada, and the Science Advisor for Health Canada. These individuals are responsible for updating review documents on the health effects of air pollution, which form the basis of negotiations between federal, provincial and territorial government stakeholders in partnership with the Canadian Council of Ministers of the Environment. These documents are used in decisions related to national air quality standards and are also consulted by the US Environment Protection Agency and other international bodies. Our successes inspired others, such as Michelle Petri's group at Johns Hopkins to study air pollution and SLE. It's a very exciting time.

Are there other areas of interest you would like to investigate in the future?

I'm very interested in personalized treatment for SLE patients—beginning with hydroxychloroquine (HCQ). Although HCQ is a key drug, there are increasing concerns about side effects. Uncertainty about the balance between the risks and benefits of stopping or continuing HCQ is a primary gap voiced by SLE patients and their doctors. Almost all rheumatologists in the world prescribe HCQ on a daily basis, but we do not have evidence on how to best use it. I have been working with wonderful SLICC and CaNIOS investigators to identify subgroups of SLE patients at particular risk of having flares or developing adverse events associated with HCQ use. However, truly personalized treatment must consider patients' preferences, and Glen Hazlewood is helping me design a discrete choice experiment on that topic, with other CaNIOS investigators. Ultimately we need pragmatic trials to understand outcomes related to reducing HCQ in select groups (considering their risk profile and preferences).

What have been the most rewarding aspects of going into the field of rheumatology and what have been some of the most challenging aspects?

I love the relationships our patients develop with us. I love helping a patient find the right combination of therapies to make them feel the best that they can be. This was something that I think Hani El-Gabalawy first taught me. The most challenging thing is that most of my patients don't have easy access to physiotherapy, occupational therapy, social work, or counselling. It also scares me when my patients are hospitalized with life-threatening complications. But one of my first rheumatology mentors, Dr. Barringer, told me that we can't allow ourselves to

feel overwhelmed; our patients may feel overwhelmed but it is our job to be strong and do all we can to help them overcome every setback along every part of their journey. This is made easier by the wonderful comradeship of my fellow rheumatologists who work so hard for our patients, especially my colleagues at the Montreal General: Chris Pineau, Evelyne Vinet, Ines Colmegna, Beth Hazel, Fares Kalache, Arielle Mendel, Michael Starr, Michael Stein, Mary-Anne Fitzcharles, and Pantelis Panopalis (plus our very hard-working staff).

What is your proudest accomplishment?

I don't feel that I should be proud of any accomplishments. I have been given so many opportunities and have been so inspired by special people like Cheryl Barnabe, Jessica Widdifield, Evelyne Vinet, Glen Hazlewood, Stephanie Keeling, Murray Urowitz, Carter Thorne, Dafna Gladman, Susan Bartlett, Michel Zummer, Debbie Feldman, and so many others.

What advice would you give to someone looking to pursue a career as an academic rheumatologist?

Be grateful, be mindful. Always remember that you were placed on this earth for a reason (www.desiderata.com/desiderata.html). For me, the greatest academic rheumatologists are people like Marie Hudson and Ines Colmegna who live to serve others and strive for excellence. Unfortunately, academia can feel like a "rat race." We must look to the example of people like Marie and Ines and others who never seem to forget the reason we are here: to find answers for our patients, to help them live better lives.

You are handed a plane ticket to anywhere in the world (once the pandemic is over). Where do you go?

Well, I am crazy about Vienna, such a wonderful city...but I can't wait to see my mom again, so I guess I would pick Winnipeg over Vienna this time.

You are marooned on a desert island. What book would you like to have on hand with you?

I would choose the scriptures... I need to be reminded every day that I am loved, I am forgiven, I am free...and I need a constant reminder that since I have been shown so much love and mercy, I must try to show the same.

Are you more of a morning or night person?

I grew up on a farm so... Early to bed, early to rise.

How many cups of coffee does it take to make a productive day?

I love green tea and I drink several cups a day but have to swear off it by 1 or 2 pm. Sometimes I have a little espresso after lunch. Dark chocolate helps too.

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