Congratulations / Félicitations

Brad H. Nelson, PhD

Founding Director, BC Cancer's Deeley Research Centre; Professor of Biochemistry & Microbiology, University of Victoria; Professor of Medical Genetics, University of British Columbia; Scientific Co-Director, BC Cancer's Immunotherapy Program

The 2022 CSI – Hardy Cinader Award Recipient

Presentation: "30 Years in the Cancer Immunotherapy Field, and More Optimistic Than Ever"

A native of Vancouver, Dr. Nelson started his undergraduate studies at Camosun College and University of Victoria before completing a BSc Honours in Zoology at UBC in 1987. His PhD studies were performed with Dr. David Weisblat at the University of California at Berkeley and focused on ectodermal versus mesodermal fate determination during leech embryogenesis. His mother-in-law's ovarian cancer diagnosis in 1989 inspired Dr. Nelson to switch his career focus to cancer immunotherapy, and in 1991 he began a postdoctoral fellowship with Dr. Philip Greenberg at the Fred Hutchinson Cancer Research Center and University of Washington (UW) in Seattle. The goal of his postdoctoral project was to genetically engineer "helper-independent" CD8 T cells for use in cancer immunotherapy, which led him to create a chimeric IL-2 receptor system that, in addition to potential therapeutic use, proved useful for deciphering the mechanisms of signal transduction by the IL-2 receptor.

Dr. Nelson held faculty positions at Fred Hutch and UW and in 1997 moved to the Benaroya Research Institute in Seattle, a leading centre in translational research in autoimmunity. This new environment sparked Dr. Nelson's interest in B cells and autoantibodies, which play such a prominent role in many autoimmune conditions yet at the time were often overlooked in the setting of cancer. At Benaroya, Dr. Nelson took his first steps into the B cell world by profiling the systemic antibody response to ovarian cancer. Moreover, continuing his work on IL-2 receptor signaling, his team elucidated the complementary roles of the STAT5 and Shc pathways in controlling lymphocyte proliferation.

In 2003, Dr. Nelson became the founding director of BC Cancer's Deeley Research Centre in Victoria, a position he holds to this day. He also serves as Professor of Biochemistry and Microbiology at UVic and Professor of Medical Genetics at UBC. Still focusing on ovarian cancer, his team applies histologic, genomic and bioinformatic methods to decipher the cellular and molecular mechanisms by which T cells, B cells and myeloid cells interact in the tumor microenvironment. Dr. Nelson's team has made seminal contributions toward understanding the immunologic and prognostic impact of tumour-infiltrating B cells and plasma cells in human cancer. In collaboration with Dr. Rob Holt's lab at the Genome Sciences Centre in Vancouver, they were among the first groups to use next-generation sequencing to profile the TCR repertoire (TCR-seq) and to systematically identify and track immunogenic mutations (neoantigens) in human cancer. In pioneering work with Dr. Sohrab Shah's group, they showed that anti-tumor T cell responses are associated with neoantigen elimination, allele-specific HLA loss, and reduced intratumoral heterogeneity in ovarian cancer, revealing how the immune system 'sculpts' the clonal architecture of tumors across time and space.

As Scientific Co-director of BC Cancer's Immunotherapy Program, Dr. Nelson and colleagues have developed a phase I clinical trials program focused on adoptive T-cell therapy, which includes a clinical-grade CAR-T cell manufacturing facility and immune monitoring facility in Victoria. With colleagues at Ottawa Health Research Institute, they have an ongoing Phase I/II clinical trial of CD19 CAR-T cell therapy for lymphoid cancers, which is creating a new model for accessible and affordable point-of-care CAR-T cell manufacturing within the Canadian healthcare system. He is also a co-founder and CEO of Innovakine Therapeutics Inc, which is developing engineered cytokine receptors to increase the potency and safety of cell-based therapies for cancer. Dr. Nelson's passion is to leverage the complementary strengths of the public and private sectors to create innovative cell therapies that are safe, effective, affordable and accessible to cancer patients in Canada and beyond.