

Focus on Faculty #40

Ivan Topisirovic



[Dr. Ivan Topisirovic](#) is an Associate Professor in the Gerald Bronfman Department of Oncology, McGill University and Principal Investigator in the Lady Davis Institute at the Jewish General Hospital. He obtained his medical degree from the University of Belgrade in 2000. Upon completion of his medical degree he obtained a PhD in Molecular Biology at the Faculty of Biology in Belgrade in 2003. In 2001, he started his postdoc at the Mount Sinai School of Medicine in New York under the supervision of Dr. Katherine L.B. Borden, where he completed a large part of the work that was to be used for his PhD thesis on the role of the eukaryotic translation initiation factor 4E (eIF4E) in regulating export of messenger RNAs (mRNAs) from the nucleus. In 2004, he followed Dr. Borden who moved her lab to IRIC, Université de Montréal, where he continued studying the mechanisms of regulation of gene expression at the post-transcriptional level. In 2009, he joined the laboratory of Dr. Nahum Sonenberg at the Goodman Cancer Research Centre, McGill University as a Research Associate. Herein, he studied the role of the mammalian/mechanistic target of rapamycin (mTOR) in control of protein synthesis, cell size and cell cycle. In 2011, he obtained an independent position at the Lady Davis Institute as a Principal Investigator, and an Assistant Professor position in the Department of Oncology at McGill. In 2018, he was granted tenure and promoted to an Associate Professor.

The major focus of his group is to decipher how protein synthesis and metabolism are regulated in normal cells and how their dysregulation leads to human diseases including cancer. To this end, with their colleagues, they contributed to improved understanding of the coordination of protein synthesis and metabolic programs. Moreover, they identified factors whose aberrant activity alters protein synthesis and metabolism in ways that favour neoplastic growth. They have also participated in discoveries which addressed gaps in knowledge pertinent to the mechanisms of initiation of mRNA translation and quality control of newly synthesized polypeptides. In the future, they hope that these findings will provide the molecular bases for further studies which may contribute to the body of knowledge required to devise more effective anti-cancer treatments.

Throughout his career, Dr. Topisirovic benefited immensely from excellent mentorship by Drs. Stanka Romac, Ze'ev Ronai, Nahum Sonenberg and Roderick R. McInnes. He was also very fortunate to forge a number of collaborations including those with Drs. Ola Larsson and Luc Furic, who he met in Dr. Sonenberg's lab and with whom he has collaborated for over a decade. This in combination with very talented and dedicated trainees and staff members, makes his job relatively easy and he is very grateful for this.

We asked Dr. Topisirovic to list a few of his articles published during his stay at McGill whose work he is particularly proud of or enjoyed the most. He noted that these are not "his articles", but collaborative efforts of a number of people that he was fortunate enough to know:

Guan BJ*, van Hoef V*, Jobava R, Elroy-Stein O, Valasek LS, Cargnello M, Gao XH, Krokowski D, Merrick WC, Kimball SR, Komar AA, Pelletier J, Koromilas AE, Wynshaw-Boris A, **Topisirovic I****, Larsson O**, Hatzoglou M** (2017) A Unique ISR Program Determines Cellular Responses to Chronic Stress. *Mol. Cell* 68(5):885-900 (*co-first; **co-corresponding)

Gandin V*, Masvidal L*, Hulea L*, Gravel SP, Cargnello M, McLaughlan S, Cai Y, Morita M, Rajakumar A, Pollak M, Porco JA Jr., St-Pierre J, Pelletier J, Larsson O**, **Topisirovic I**** (2016) nanoCAGE reveals 5' UTR features that define specific modes of translation of functionally related mTOR-sensitive mRNAs *Genome Research*, 26(5):636-48 (*co-first; **co-corresponding).

Morita M, Gravel SP, Chénard V, Sikström K, Zheng L, Alain T, Gandin V, Avizonis D, Arguello M, Zakaria C, McLaughlan S, Nouet Y, Pause A, Pollak M, Gottlieb E, Larsson O, St-Pierre J*, **Topisirovic I***, Sonenberg N * (2013) mTORC1 controls mitochondrial activity and biogenesis through 4E-BP-dependent translational regulation. *Cell Metabolism* 18(5):698-711. (**co-corresponding)

Dowling RJ*, **Topisirovic I***, Alain T, Bidinosti M, Fonseca BD, Petroulakis E, Wang X, Larsson O, Selvaraj A, Liu Y, Morrow T, Kozma SC, Thomas G and Sonenberg N. (2010) mTORC1-mediated cell proliferation, but not cell growth, is controlled by the 4E-BPs. *Science* 328(5982):1172-6 (*co-first)