

Immune Regulation and Therapeutic Immunisation

Ian Frazer

2008 Balzan Prize for Preventive Medicine, including Vaccination

Balzan GPC Adviser: Werner Stauffacher

Researchers: Antje Blumenthal, Steven Mattarollo

Affiliated Institution: Diamantina Institute, University of Queensland

Period: 2008-2013

Websites: <http://www.di.uq.edu.au/dr-antje-blumenthal>;

<http://www.di.uq.edu.au/professor-ian-frazer>

<http://www.di.uq.edu.au/dr-stephen-mattarollo>

Ian Frazer is a former Director of the Translational Research Institute in Brisbane and Research Group Head at the University of Queensland Diamantina Institute. He used the funds available from his 2008 Balzan Prize to support two fellows, Antje Blumenthal and Steven Mattarollo, who were based with Frazer's group at the University of Queensland, Brisbane. Blumenthal investigated how pathogens are recognized by the immune system, how appropriate inflammatory responses are initiated and regulated, and how this instructs adaptive immune responses that are critical to control chronic infections.

Steven Mattarollo was funded for two years to work in Melbourne, Australia, with Professor Mark Smyth, an acknowledged world expert on the role of NKT cells in control of cancer cell growth. During these two years as a Balzan Fellow he pursued two main lines of research: developing a therapeutic cancer vaccine against melanoma and non-Hodgkins B cell lymphoma that induces innate and adaptive immunity by targeting the immune adjuvant properties of NKT cells; determining the immune constituents that are important for the therapeutic effectiveness of chemotherapies, and assessing combination chemo-immunotherapy strategies for treating solid tumours.

Publications

- Blumenthal A, Nagalingam G, Huch JH, Walker L, Guillenmin GJ, Smythe GA, Ehrt S, Britton WJ, Saunders BM. 2012. Mycobacterium tuberculosis induces potent activation of IDO-1, but this is not essential for the immunological control of infection. *PLoS ONE* 7(5): e37314.
- Mattarollo SR, Youg M, Gosmann C, Choyce A, Chan D, Leggatt GR, Frazer IH. 2011. NKT cells inhibit antigen-specific effector CD8 T cell induction to skin viral proteins. *J. Immunol.* Jul. 8: 187(4): 1601-1608.
- Mattarollo SR, Yong M, Tan L, Frazer IH, Leggatt GR. 2010. Secretion of IFN-gamma but not IL-17 by CD1d-restricted NKT cells enhances rejection of skin grafts expressing epithelial cell-derived antigen. *J. Immunol.* 184(10): 5663-9.
- Mattarollo SR, Rahimpour A, Choyce A, Godfrey DI, Leggatt GR, Frazer IH. 2010. Invariant NKT cells in hyperplastic skin induce a local immune suppressive environment by IFN-gamma production. *J. Immunol.* 184(3): 1242-50.
- Mattarollo SR, West A, Steegh K, Duret H, Paget C, Martin B, Matthews G, Shortt J, Chesi M, Leif Bergsagel P, Bots M, Zuber J, Lowe S, Johnstone R, Smyth MJ. 2012. NKT cell adjuvant-based tumor vaccine for treatment of myc oncogene-driven B cell lymphoma. *Blood.* 120(15): 3019-3029.