Rachael Ryan, Immunome Res 2018, Volume 14
DOI: 10.4172/1745-7580-C2-017

Exploring the immunosuppressive potential of venom-derived molecules

Rachael Ryan
James Cook University, Australia

The unique combinations of potent, specific, and fast-acting molecules within venom act to rapidly disrupt vital biological processes in prey and predators. Ironically, the same characteristics that make venom effective for subduing prey presents an ideal platform for the exploration of immunological pathways and novel therapeutics. This study mapped snake venom components with potent immune modulating abilities for drug development in the field of autoimmune and chronic inflammatory diseases. Immunosuppressive venoms were fractionated using reversed-phase high-performance liquid chromatography (RP-HPLC) and screened for activity against mitogen-induced cell stimulation and cytokine release. The effects of venom on human leukocytes were assessed using multiplex bead-based assays, flow cytometry, proliferation assays and cell viability assays. The results showed that a specific venom-derived molecule (SV14) significantly inhibited IFNγ and TNFα release when primary leukocytes were stimulated with either PMA and ionomycin or CD3/CD28 activation beads. Interestingly, no change was observed in the myeloid compartment in response to lipopolysaccharide activation. It was further observed that SV14 inhibited T-cell cytokine release without inhibiting cell proliferation or reducing cell viability. Investigations are currently being undertaken to test the efficacy of SV14 in a mouse model of inflammatory bowel disease. Collectively, these data reveal that novel venom-derived molecules can specifically target and deactivate T-cells and could potentially be used to control or fine-tune the function of the human immune system.

Biography

Rachael Ryan has completed her Bachelor of Science with class I honours at Griffith University. She is currently pursuing her PhD with the Australian Institute of Tropical Health and Medicine at James Cook University in Australia.

rachael.ryan1@jcu.edu.au

Notes: