Dual-specificity IL233 Cytokine for Modulation of Organ Specific Inflammation

Inventor: Rahul Sharma
IL-2 and IL-33

- IL-2 is an important negative regulator of inflammation via regulation of Treg homeostasis and function
- IL-33 induces anti-inflammatory effects through resolution of pro-inflammatory Th1 and Th17 responses

**Clinical Problem:**
- Combination therapy of IL-2 and IL-33 is more specific and has fewer side effects than using either alone
IL-233 hybrid cytokine

**Solution:** A novel cytokine, IL233, capable of activating regulatory T cells and successfully treating both chronic and acute inflammatory disease states

- Simultaneously promotes Treg and Th2 responses by suppressing Th1 and Th17 responses, while inhibiting activation of pro-inflammatory immune cells
- Can be applied to treatments for: diabetes, lupus, lupus glomerulonephritis, diabetic nephropathy, renal ischemia reperfusion, and obesity
Treatment with IL233 increases natural Tregs in mice

NOD mice were injected with 5 daily doses of 1 µg equivalent of a combination of IL-2 and IL-33 or IL233 and CD4+Foxp3+Helios+ cells were evaluated in the peripheral blood by flow cytometry.
Treatment with hybrid IL233 is more effective than either cytokine alone or combination.

Type 1 Diabetes

Renal Ischemia Reperfusion

Lupus

Treatment with IL2, IL33, IL2+IL33 or IL233 in diabetic, renal injury, and lupus mouse model systems.
Relevant Publications & Intellectual Property


- UVA Tech ID: SHARMA-FUSION
  - Title: Fusion protein comprising interleukin-2 and interleukin-33