

# ImmunoTools IT-Box-Cy55M-Award 2013



**Charlotte O'Donnell**

PhD Supervisor: Dr. Aileen Houston

University College Cork, Department of Medicine,  
Clinical Sciences Building, Cork University Hospital,  
Cork, Ireland

## **The Role of the cytokine IL-33 and its receptor ST2 in promoting colon carcinogenesis.**

The cytokine IL-33 and its receptor ST2 have been implicated in many inflammatory diseases. Inflammation is recognised as a hallmark of cancer. Little is known about the role of ST2 and IL-33 in cancer. Recent research has indicated that IL-33 and ST2 may be involved in tumour growth and metastasis (Jovanovic et al. 2011, Gillibert-Duplantier et al. 2011). We are interested in colon cancer as IL-33 and ST2 is elevated in ulcerative colitis a key risk factor for the development of colon cancer. In non-cancer cells expression is induced by TNF- $\alpha$ . It is not known how the IL-33/ST2 pathway is regulated in cancer cells. The ST2/IL-33 pathway activates a Th2 immune response. We aim to stimulate ST2 using IL-33 to examine how the tumour microenvironment is affected. IL-4, IL-5 and IL-13 are produced during a Th2 response. A Th2 response can be pro-tumour. IL-13 has been shown to polarise macrophages towards an M2 pro-tumour phenotype. TNF- $\alpha$  will be used to determine if this can stimulate the IL-33/ST2 pathway, as it does in non-cancer cells. We will examine ST2 activation in colon cancer cells using a variety of cytokines including Th2 cytokines IL-4, IL-5 and IL-13. IL-4 has been shown to increase expression of ST2 in non-cancer cells. IL-33 will be used to stimulate the ST2 receptor and the cytokine profile compared to that of ST2 knock out cells. Macrophages from ST2 knock-out mice will be stimulated with IL-13 to determine if they can polarise towards an M2 pro-tumour phenotype.

*Gillibert-Duplantier, J. et al., 2011. Gene expression profiling identifies sST2 as an effector of ErbB2-driven breast carcinoma cell motility, associated with metastasis. Oncogene, 2, pp.1-9. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/22105364>.*

*Jovanovic, I. et al., 2011. ST2 deletion enhances innate and acquired immunity to murine mammary carcinoma. European journal of immunology, 41(7), pp.1902-1912. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/21484786>.*

## **ImmunoTools IT-Box-Cy55M for Caitriona Lyons includes 55 recombinant cytokines**

rm EGF, rm Eotaxin / CCL11, rm FGF-a / FGF-1, rm FGF-b / FGF-2, rm FGF-8, rm Flt3L / CD135, rm G-CSF, rm GM-CSF, rm GRO-a / CXCL1, rm GRO-b / CXCL2, rm IFN $\gamma$ , rm IL-1 $\alpha$ , rm IL-1 $\beta$ , rm IL-2, rm IL-3, rm IL-4, rm IL-5, rm IL-6, rm IL-7, rm IL-9, rm IL-10, rm IL-11, rm IL-13, rm IL-15, rm IL-16, rm IL-17A, rm IL-17C, rm IL-17F, rm IL-19, rm IL-20, rm IL-21, rm IL-22, rm IL-25 / IL-17E, rm IL-27, rm IL-31, rm IL-33, rm IP-10 / CXCL10, rm LIF, rm MCP1 / CCL2, rm M-CSF, rm MIP-1 $\alpha$  / CCL3, rm MIP-1 $\beta$  / CCL4, rm MIP3 $\alpha$  / CCL20, rm MIP3 $\beta$  / CCL19, rm NGF-beta, rm PDGF-AA, rm PDGF-BB, rm RANTES / CCL5, rm sCD40L / CD154, rm SCF, rm SDF-1 $\alpha$  / CXCL12a, rm SDF-1 $\beta$  / CXCL12b, rm TNF $\alpha$ , rm TPO, rm VEGF

[DETAILS](#)