ImmunoTools IT-Box-Cy55M-Award 2013

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The role of SLPI in immune control of bacterial infection

Secretory leucoprotease inhibitor (SLPI) has been shown to protect local tissues from the damaging effects of inflammation through the inhibition of proteases such as neutrophil elastase (NE) as well as prevention of NFκB activation. It is also well documented as an anti-microbial which has been shown to be active against bacteria, viruses and fungi. It is thus a key therapeutic target for conditions with high protease activity and bacterial burdens such as Cystic Fibrosis (CF) where recombinant SLPI therapy has previously shown positive results (McElvaney *et al*. 1992).

The aim of my project is to characterise the role of SLPI during general immune functions, in particular it's role in protecting against bacterial infection. In order to do this, SLPI KO mice are used with their WT littermates to look at differences in the immune response in the absence of SLPI. The immune system functional abilities of SLPI KO mice have never before been characterised, therefore this is a primary focus of my project.

In order to achieve this, flow cytometry has been used to look at any variations in immune cell numbers: T cells ($CD4^+$ helper cells, $CD8^+$ cytotoxic $FOXP3^+$ regulatory), NK cells (CD3-$NKp46^+$), NKT-like cells ($CD3^+NKp46^+$), B cells ($B220^+$) neutrophils ($CD11b^+Gr1^+$), monocytes ($CD11b^+CD14^+$), macrophages ($CD11b^+F4\text{-}80^+$) and DCs ($CD11b^+CD11c^+$). In addition to this, functional assays will need to be completed with plans to study migration, proliferation, polarisation and phagocytosis of SLPI KO cells compared to WT. Polarisation experiments which are to be completed include $CD4^+$ T cells into Th1 (IL-12, IL-18), Th2 (IL-4, anti-TGFβ), Th9 (IL-4, TGFβ), Th17 (IL-6, TGFβ) and Th22 (IL-6, TNFα). As well as this macrophages can be polarized into M1 (IFNγ, LPS), M2a (IL-4, IL-13), M2b (IL-1β, LPS), M2c (IL-10, TGFβ). To achieve this a vast array of cytokines will be required to polarize cells towards various phenotypes, as such I could make great use of your ImmunoTools *IT-Box-Cy55M*.

MCELVANEY, N.G., DOUJAIJI, B., MOAN, M.J., BURNHAM, M.R., WU, M.C. and CRYSTAL, R.G., 1993. Pharmacokinetics of recombinant secretory leukoprotease inhibitor aerosolized to normals and individuals with cystic fibrosis. *The American Review of Respiratory Disease,* **148**(4 Pt 1), pp. 1056-1060.

ImmunoTools *IT-Box-Cy55M* for **Megan Osbourn**
includes 55 recombinant mouse 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 IFNgamma, rm IL-1alpha, rm IL-1beta, rm IL-2, rmIL-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-1α/ CCL3, rm MIP-1β / CCL4, rm MIP3α / CCL20, rm MIP3β / CCL19, rm NGF-beta, rm PDGF-AA, rm PDGF-BB, rm RANTES / CCL5, rm sCD40L / CD154, rm SCF, rm SDF-1α / CXCL12a, rm SDF-1β / CXCL12b, rm TNFα, rm TPO, rm VEGF DETAILS.