

ImmunoTools IT-Box-Cy55M-Award 2013



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Impact of bioactive compounds of breast milk on host cells

Beyond the nutritional composition, breast milk contains several components which are considered protective and to supplement innate immunity, impacting infant microbiota composition and health. Protection is provided by bioactive components such as beneficial microorganisms, oligosaccharide and other compounds as IgA, growth hormones, cytokines and chemokines (e.g. IL-10, IL-6, IL-8, IL-1 α , IL-3, IL-16, Gro- α , SDF-1 α). HM composition depends on different variables (e.g. maternal health, nutritional status, diet) and also, it change as a function of both time of day and milk maturation. Bioactive components present in breast milk might contribute to the development of the gastro-intestinal, nervous and early immune system and was shown to confer protection against gastrointestinal diseases and inflammatory conditions such as necrotizing colitis (NEC) in the very early stages of life. However, the precise *in vivo* effects in the newborns and mechanisms of some of these bioactive agents remain to be determined.

We would like to use the recombinant cyto- and chemokines from **ImmunoTools** for immunostimulation experiments in both, cultured intestinal epithelial cells and in a mouse model of NEC in order to evaluate their effect regarding inflammation score and intestinal barrier integrity. We are particularly interested in those cytokines which were previously shown to be present in higher concentrations in colostrum than in mature breast milk (IL-8, EGF, IL-6, TNF- α , IL-1 α , IL-16, IL-3) and which suggest to be important for neonates development and protection against diseases in the first days of life albeit the pro-inflammatory character of some of these cytokines. In a second part we will test for the effects of these cytokines in combination with probiotics (as *Bifidobacterium* and *Lactobacillus* spp. which have been also shown to be present in milk), known to interact with TLR-signalling pathways and thereby modulating NF-kappa B activity.

ImmunoTools IT-Box-Cy55M for **Laia Mira Pascual**
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-1 α / CCL3, rm MIP-1 β / CCL4, rm MIP3 α / CCL20, rm MIP3 β / CCL19, rm NGF-beta, rm PDGF-AA, rm PDGF-BB, rm RANTES / CCL5, rm sCD40L / CD154, rm SCF, rm SDF-1 α / CXCL12a, rm SDF-1 β / CXCL12b, rm TNF α , rm TPO, rm VEGF [DETAILS](#).