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Impact of the exposure period to galactooligosaccharides/inulin prebiotics on immune system orientation.

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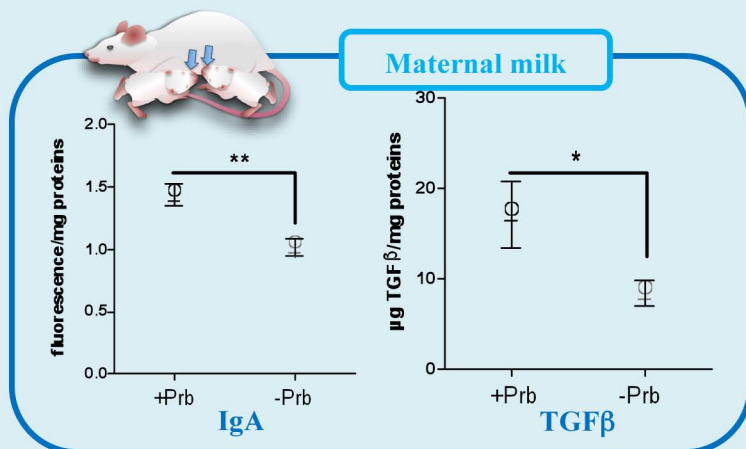
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Aim : To define the best exposure period (perinatal, postnatal) to a prebiotic mix able to induce immune pathways related to tolerance mechanisms.

Background : Prebiotics are digestion resistant molecules able to stimulate intestinal microbiota, acting then on immune system. They constitute emerging tools to alleviate some pathologies including allergies. However, there are not enough data proving their efficacy and their impact on immune system is yet not fully understood.

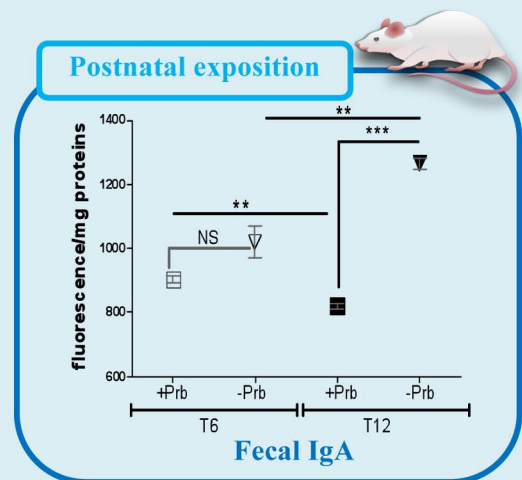
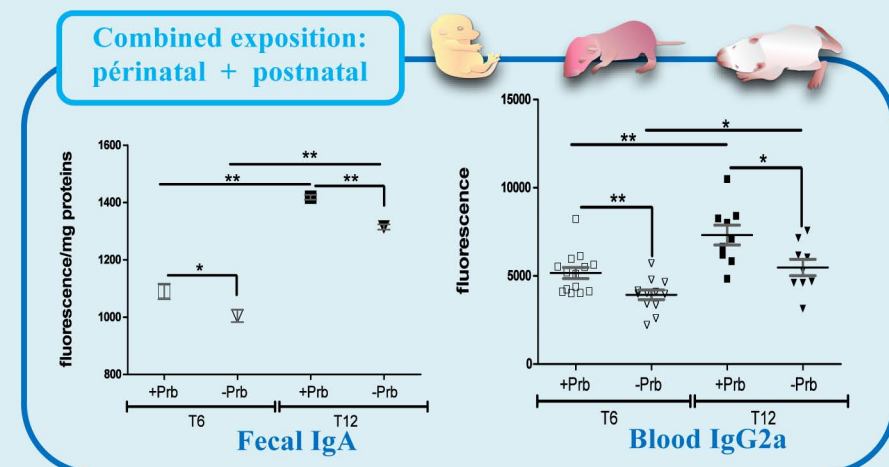
Methods : Balb/c mice were fed with a galactooligosaccharides/inulin prebiotic mix enriched diet along perinatal period (gestation, parturition, lactation) and/or postnatal period (from weaning to 12 weeks of age). Some markers of immune pathways related to tolerance mechanisms (T regulatory response : Treg : IgA, IL-10 and TGFβ ; Th1 response : IgG2a and IFNγ) and to allergy (Th2 response : IgE, IgG1 and IL-4) were analysed.

Results : When prebiotic enriched diet were introduced only during postnatal period, on the one hand IFNγ levels were increased, while IgG2a levels remain unchanged ; on the other hand TGFβ levels were increased, whereas IgA levels were decreased. Milk from lactating dams fed with prebiotic enriched diet displayed higher concentrations of both IgA and TGFβ. When prebiotics were introduced during both perinatal and postnatal period, IL-10, IgA and IgG2a levels were increased. Whatever the exposition period to prebiotics IgG1, IgE and IL-4 levels remains unchanged (not shown).



	Cytokine concentration (pg/ml)					
	IFN-γ		TGFβ		IL-10	
	+Prb	-Prb	+Prb	-Prb	+Prb	-Prb
Combined exposition	2597 ± 118	2233 ± 289	683 ± 3826	-	152 ** ± 51	1.7 ± 0.7
Postnatal exposition	6430 *** ± 286	5423 ± 274	92* ± 8	34 ± 4	729 ± 26	725 ± 25

*, **, *** statistical differences between +Prb and -Prb



Conclusions : Prebiotic exposure period exert a major effect on cytokine and immunoglobulin secretion. This study proves that the combined exposure period (perinatal + postnatal) to prebiotic mix must be beneficial to induce Th1 and Treg related immunoglobulin production. This tolerogenic prebiotic effect must be mediated by microbiota and/or by maternal milk immunological active compounds such as IgA or TGFβ. Thus perinatal prebiotic administration may constitute a good tool to induce oral tolerance and to prevent from allergic diseases.