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The repertoire of natural anti-glycan antibodies during first year of life

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Blood of humans and mammals contains natural antibodies (nAbs). Their presence is not associated with previous immunization. High diversity in specificity of human natural anti-glycan antibodies was shown earlier using glycochip. The origin and mechanism of nAbs formation are of particular interest because of a number of their functions, including protection against infections, maintenance of metabolic clearance and cancer cells. At the present work serum samples of healthy infants (age 3, 6, and 12 months) with different types of nutrition were analyzed using glycochip, containing ~ 400 glycans (constituents of mammalian glycoproteins and glycolipids) and 150 bacterial O-polysaccharides. The analysis of obtained data demonstrated that the repertoire of own anti-glycan Abs found to form at early stage of human development and by the age of 1 year contains the antibodies that will be constantly present in blood during the lifetime. The IgG and IgM dynamics have an opposite direction through this time: IgM level is increased whereas IgG - decreased. Changes in anti-glycan repertoire are closely related to nutritive factor: antibodies to different glycan sets were detected in serum of infants with different types of nutrition. The narrowest repertoire of anti-glycan Abs was observed in the group of breastfed infants that is caused, probably, by antigenic compatibility of mother and infant. Those fed by partially hydrolyzed formula demonstrated the widest repertoire of anti-glycan Abs. Taken together, the glycochip data, structures of O-polysaccharides and literature data for dynamics of child microflora formation extend our understanding of mechanism of nAbs formation. The reported study was partially supported by RFBR research project No 13-04-00549 A.

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