RECOGNITION BY SIGLECS AND GALECTINS OF DISTINCT CARBOHYDRATE STRUCTURES ON *KLEBSIELLA PNEUMONIAE* CELLS

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The innate immune system is equipped with a battery of lectins that recognize carbohydrate structures displayed on bacterial surfaces. Siglecs (immunomodulatory sialic acid-binding immunoglobulin-like lectins) and galectins are two main families of innate immune lectins. In this work, we have comparatively examined the binding patterns of different Siglecs and galectins to a collection of *Klebsiella pneumoniae* clinical isolates exhibiting or not a hypermucoviscous (HMV) phenotype [1]. To this aim, we have used an application of the microarray technology developed in our group [2,3], which consists in the generation of bacteria microarrays and subsequent lectin binding assays to the array-printed bacterial cells. No significant differences among isolates in sialic acid content or recognition by Siglecs were observed, irrespective of their HMV/non-HMV phenotype and capsular or O-antigen serotype. Siglec binding to most of the isolates points to the recognition of a common epitope, capsular glucuronic acid appearing as possible candidate. In contrast, clearly different isolate-selective binding patterns were observed for the galectins tested. Indeed, galectin- and Siglec-binding patterns did not correlate, with some isolates showing almost exclusive binding of Siglecs, others displaying predominant binding of galectins, and a third set of isolates exhibiting moderate to intense binding of several Siglecs and galectins. Galectin recognition correlated with the binding of galactose-specific model lectins and detection of the O1 serotype. Moreover, galectin binding to isolates recognized by mannose-specific lectins was very weak or even negligible, particularly for isolates with mannose-based O3 typed chains. Altogether, the results pointed to the lipopolysaccharide O-chain as a ligand candidate for galectins. In addition, protein bands recognized by galectin-9, but not by Siglec-10, examined as representative lectins, were detected by Western blot analysis in the outer membrane of a selected isolate. Thus, Siglecs and galectins apparently target different carbohydrate structures on *K. pneumoniae* surfaces, thereby behaving as non-redundant complementary tools of the innate immune system.

References:

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