Deciphering the molecular basis of the enigmatic macrophage galactose C-type lectin recognition

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Glycans have an important role on immunomodulation.[1] The human macrophage galactose C-type lectin (MGL) is the only C-type lectin present on immune cells with a marked sugar specificity for N-acetylgalactosamine (α- or β-GalNAc).[2] MGL recognizes GalNAc containing structures that can be present in pathogens, self-glycoproteins, and tumour cells, which makes MGL a modulator of distinct immune cell responses. Herein, our latest advances in unlocking the structural and dynamic features, behind the fine specificity, and molecular recognition of MGL, will be described. Through an integrative and multidisciplinary approach, we revealed that the carbohydrate recognition domain (CRD) of MGL is highly dynamic and is strongly dependent of the structure and presentation of the precise GalNAc-containing antigen, [3-5] which might explain the capacity of MGL to modulate tolerance versus immunity responses. Furthermore, the molecular recognition of distinct mucin-derived tumour-associated glycans, common in several tumours, by MGL was also investigated, and our data also pinpoints the ability of MGL to specifically discriminate different tumour-associated antigens.[6]

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