

TITLE: GLYCODENDRONS: NEW TOOLS FOR CELL SURFACE AND CELL-CELL INTERACTIONS STUDIES

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ABSTRACT

Cell recognition, adhesion and internalization are involved in many biological processes, such as reproduction, infection and inflammation. These processes are generally mediated by interactions between molecules located in the cell membrane and the extracellular matrix. Among the most important molecules involved in cell interactions are the carbohydrates and proteins (e.g. lectins). The knowledge about these molecules is essential to better understand many biological phenomena in uni- or pluricellular organisms. The researchers are more frequently focused on the identification of the carbohydrates present on the cell surface by using labeled lectins. Alternatively, here we present a pioneer research performed by using three different labeled carbohydrates in a multivalent presentation (glycodendrons) to detect the presence of lectins on cell surfaces of twelve species of microalgae. We tested trivalent molecules containing residuals of D-mannose, L-fucose or *N*-acetyl-galactosamine to identify their interactions with the corresponding lectins expressed on cell surfaces. We envisage that our new approach could be an alternative tool for taxonomic and physiological studies on microalgae or even on other groups of organisms. The glycodendron of *N*-acetylgalactosamine interacted with a higher number of species, suggesting that this carbohydrate is common among microalgae. In contrast, D-fucose carbohydrate interacted with few species. Based on our results, the receptors found in the cell surface of the algal species differ in composition, quantity and distribution. The differences were mainly species-specific, since no patterns were observed at higher taxonomic level. Moreover, like lectins, labeled carbohydrates were proved to be a reliable tool for the study of cell surface composition.

Key words: cell-interaction, lectins, glycodendrons, microalgae, fluorescent probes.
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