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Glycoconjugate Recognition by Asialofetuin-Binding Lectins: Implications for Malignancy Stratification

Ashem Anjali Devi[1], Senjam Sunil Singh[1]

[1]Department of Life Sciences, Manipur University, Canchipur, Manipur, India

Email: asemthoithoibi@gmail.com

Abstract

Cancer remains a major global health challenge, reinforcing the need for selective molecular tools that can both detect and differentiate malignant glycosignatures. Asialofetuin-binding lectins are particularly valuable in this context because they recognize exposed terminal galactose residues on desialylated glycans—hallmarks of tumor-associated glycosylation changes, including aberrant sialylation and elevated galectin expression. Their high-affinity, multivalent binding enables sensitive discrimination between malignant and normal cells, often producing measurable agglutination useful for malignancy stratification. In this study, lectin extracted and partially purified (0–30% ammonium sulfate fraction) from *Bridelia retusa* (L.) A. Juss. exhibited strong and selective binding to asialofetuin, indicating a clear ability to target tumor-associated glycan alterations. This affinity suggests its suitability as a candidate biomolecule for developing lectin-based diagnostic assays aimed at identifying desialylated glycopatterns. Plant-derived asialofetuin-binding lectins also show potential anticancer relevance due to their preferential interaction with tumor cells, although their therapeutic implications require deeper investigation.

Keywords: Asialofetuin-binding lectins, Glycoconjugate recognition, Tumor-associated glycosylation, Malignancy stratification, *Bridelia retusa* lectin, Galectin-associated tumors

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