

## Crystallization of Frutalin-D-Mannose Complex

Vieira-Neto, A.E.<sup>1</sup>; Cavalcante, M.S.<sup>2</sup>; Moreno, F.B.M.B.<sup>2</sup>; Monteiro-Moreira, A.C.<sup>2</sup>;  
Moreira, R.A.<sup>2</sup>

<sup>1</sup>Departamento de Bioquímica e Biologia Molecular, Universidade Federal do Ceará, Ceará, Brazil; <sup>2</sup>Núcleo de Biologia Experimental, Universidade de Fortaleza, Ceará, Brazil.

**INTRODUCTION:** Frutalin is a useful protein in biotechnology obtained from *Artocarpus incisa* seeds, and its molecular basis of interaction has been established with the resolution of its three-dimensional structure. The complexing of the protein with different linkers can further elucidate its functions and structural nuances. **OBJECTIVES:** This study demonstrates the crystallization and optimization of frutalin crystals in the presence of D-mannose, suggesting that the carbohydrate recognition site is structurally flexible. **METHODS:** Protein was isolated by affinity chromatography on agarose-D-galactose column, he had a purity demonstrated by ESI-MS and SDS-PAGE and was subjected to crystallization trials in hanging drop technique. INDEX Kits (Hamptons Research) were used. The optimization was performed using the components of the crystallization medium with analytical reagents (Sigma) and screens concentration and pH. **RESULTS:** A crystal of intermediate size was initially obtained in Index 75 condition, which contains Lithium Sulfate 0.2 M, Bis-Tris 0.1 M pH 6.5 and PEG 3350. The condition shows different pH of the crystalline structure containing D-galactose (MONTEIRO-MOREIRA et al., 2015), which suggests that at pH 6.5 the protein has structural conformation that allows SRC recognize D-mannose more stably. PEG 3350 is the same as other crystalline structures, which shows that the solubility of the protein does not influence their lectin activity. By using wells with a protein concentration gradient (1mg / ml - 6 mg / ml) it was possible to realize crystal growth, reaching measures 0.1mm x 0.2mm in the best condition (3mg / ml) in pH 6.5. **CONCLUSIONS:** The two crystal structures of frutalin established were obtained at different pHs, and obtaining the crystals frutalin-D-Mannose complex at pH 6.5 suggests that the lectin activity alters the pH, changing its specificity and affinity, and it increases further the potential of the molecule.

**Key Words:** Structure; Complex Frutalin-D-Mannose; *Artocarpus incisa*.