Prostate Specific Antigen (PSA) Glycan Binding Profile Analysis Based on Enzyme-Linked Lectin Assay (ELLA) and Storage Effect

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Abstract

Changes in prostate specific antigen (PSA) glycosylation profile could be used to distinguish indolent from aggressive prostate cancer (PCa). Therefore, this study aimed to develop a simple and sensitive lectin assay to obtain the glycan profiles of PSA. The glycoprofiling and the binding curve of PSA isolated from normal individual were achieved using sialic acid specific lectins (MAA I, MAA II and SNA) with enzyme-linked lectin assay (ELLA) method. The results showed SNA has the highest binding compared to MAA I and MAA II, which was relevant to the normal individual PSA sample harboring α2,6-sialic acid glycan used in this study. Meanwhile, the binding signals for MAA I was only significant starting at 700 ng/mL PSA, implying a small amount of α2,3-sialic acid glycan presented in the normal PSA. The binding saturation was denoted at A_{450} = 3.60 at a PSA concentration of 5 x 10^3 ng/mL (176 nM). In addition, the stability of assay components after been stored at room temperature for a duration of two months was assessed, in which the binding signals for PSA detection by SNA was still significantly high (A_{450} = 2.37) at PSA concentration of 1 µg/mL. Nonetheless, this study demonstrated a simple and sensitive lectin assay for PSA glycoprofiling and the potential of this assay to be performed and stored at room temperature.

Keywords: *PSA, glycoprofiling, sialic acid, lectin assay, storage*