Synthesis of polyclonal antibodies against aflatoxin b1

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Abstrak

Polyclonal antibodies of aflatoxin B1 were successfully produced from New Zealand White female rabbits after
immunization by the hapten of aflatoxin B1-carboxymethyl hydroxylamine hemihydrochloride (AFB1-CMO)
conjugated with bovine serum albumin (BSA) as the antigen. The hapten was synthesized using the carbodiimide
method with CMO as a linker. Absorption peaks at 362, 264, and 218 nm were observed as a result of characterization
with UV-Vis spectroscopy, while IR spectroscopy showed peaks at 3448 cm-1 and 1642 cm-1 attributable to the
hydroxyl and nitrile groups, respectively. Furthermore, mass spectrometry showed fragmentation at the m/z of 386,
368.2, and 310, which confirms that the hapten of AFB1-CMO was successfully synthesized. The hapten was then
conjugated with BSA to serve as an antigen of AFB1 when it was injected into the rabbits. The specificity of the antigen
towards its antibody and the confirmation of hapten-BSA conjugation were characterized using the dot blot
immunoassay, which showed a BSA concentration of 1.74 mg/mL. Two weeks after the primary immunization by its
antigen, agar gel precipitation testing showed that the rabbit blood serum had positive results for polyclonal antibodiest
against AFB1 with the highest concentration of antibodiest of 2.19 mg/mL.

Sintesa of Poliklonal Antibodi Aflatoxin B1. Antibodi poliklonal aflatoksin B1 telah berhasil diproduksi pada hewan
uji kelinci betina New Zealand White setelah diimunisasi dengan hapten aflatoksin B1-carboxymethyl hydroxylamine
hemihydrochloride (AFB1-CMO) yang dikonjugasikan dengan bovin serum albumin (BSA) sebagai antigen. Hapten
AFB1 disintesis menggunakan metode karbodiimida dengan CMO sebagai linker. Puncak absorbansi pada 362, 264,
218 nm teramati sebagai hasil karakterisasi menggunakan spektrofotometer UV-Visibel, sementara dengan spektrum IR
diperoleh puncak pada 3448.126 cm-1 dan 1642.451 cm-1 yang masing-masing mengindikasikan adanya gugus hidroksil

dan nitril. Hasil spektrometri massa menunjukkan fragmentasi pada m/z 386, 368.2, dan 310 yang membuktikan hapten
AFB1-CMO telah berhasil disintesis. Hapten ini kemudian dikonjugasikan dengan BSA agar dapat berperan sebagai
antigen AFB1 ketika diinjeksikan pada kelinci. Kekhususan antigen aflatoksin B1 terhadap antibodinya dan konfirmasi
konjugat hapten-BSA menunjukkan hasil positif pada uji dot blot immunoassay dengan konsentrasi BSA sebesar 1.74
mg/mL. Dua pekan setelah imunisasi primer, agar gel precipitation test menunjukkan hasil positif terhadap antibodi
poliklonal AFB1 dengan konsentrasi tertinggi sebesar 2.19 mg/mL.