Sintesis hapten untuk produksi antibodi pendeteksi aflatoksin B1 dengan pengembangan immunostrip partikel nano CdS = Production of antibody againts aflatoxin B1 and its preliminary studies for application in CdS nanoparticles based immuno

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Abstrak

[AFB1 merupakan mikotoksin yang dihasilkan jamur Aspergillus terutama A. flavus dan A. parasiticus yang hidup di daerah tropis. AFB1 dapat ditemukan pada berbagai produk pertanian dan makanan pokok mamalia seperti kacang tanah, jagung, kedelai, beras, dan gandum sehingga produk ini beresiko tinggi terkontaminasi toksin terutama AFB1 pada masa panen maupun pada masa penyimpanan. Resiko terbesar yang ditimbulkan toksin ini adalah kanker dan kematian. Telah banyak metode atau upaya yang dikembangkan untuk pendeteksian dini terhadap keberadaan jamur atau aflatoksin. Salah satu metode yang sederhana, terjangkau (murah), dan teruji kehandalannya adalah immunoassay dan immunokromatografi. Immunoassay membutuhkan antibodi sebagai pengenal AFB1. Pada penelitian ini antibodi AFB1 diproduksi. Mula-mula hapten AFB1 yang telah berhasil disintesis dikonjugasikan dengan protein (BSA) untuk dijadikan immunogen melalui metode ester aktif. Immunogen lalu disuntikan ke kelinci untuk menghasilkan antibodi poliklonal. Pembentukan antibodi terjadi pada hari ke-15 terhitung dari hari pertama imunisasi. Keberadaan antibodi dipastikan melalui Gel Agarose Precipitation Test (AGPT). Endapan yang terbentuk menunjukan terjadinya ikatan antara antibodi AFB1 dengan antigennya. Antibodi dimurnikan untuk dikonjugasikan dengan nano CdS hasil sintesis. Hasil konjugasi digunakan untuk mengembangkan biosensor berupa immunostrip pendeteksi aflatoksin B1. Metode immunostrip dijadikan alternatif deteksi karena teknik ini lebih praktis, cepat, mudah dilakukan oleh siapa saja.
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Aflatoxin B1 (AFB1), is mycotoxin produced by the fungus Aspergillus, especially A. flavus and A. parasiticus lived in the tropics. AFB1 composed by coumarin and two rings of furan. AFB1 can be found in a variety of agricultural products and basic food of mammals such as peanuts, corn, soybeans, rice, and wheat therefore they have high-risk products contaminated by toxin mainly AFB1 on the harvest or during storage. The greatest risk of the toxin is cancer or even death. Many methods have been developed for early detection of the presence of aflatoxins. One method that is simple, affordable (cheap), and proven reliability are immunoassay and immunochromatografi. Immunoassay needs antibody of AFB1 for the sensing antigen. The Immunogen synthesized by conjugating hapten of aflatoxin B1 with bovine serum albumin (BSA) by using the active ester method. The hapten – BSA was then injected into rabbits to produce polyclonal antibodies. The antibodies can be detected at the 15th days after the injection had been conducted. The presence of antibodies is confirmed using Agarose Gel Precipitation Test (AGPT). The precipitation showed the bond between AFB1 antibodies with antigens. The purified antibody then conjugated with nano CdS. The conjugate then applied to develop the biosensor for detection of AFB1 using immunostrip based on immunokromatographic method as an alternative method which can provide ease, rapid, simple method and practicable for everyone., Aflatoxin B1 (AFB1), is mycotoxin produced by the fungus Aspergillus,

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