

Analytica Chimica Acta 2004 vol.502 N1, pages 23-30

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## Amperometric DNA biosensor for the determination of auto-antibodies using DNA interaction with Pt(II) complex

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### Abstract

A method of denatured DNA immobilisation on cellulose nitrate film has been developed. A modified film of uniform and stable surface has been used as a bio-sensitive part of amperometric DNA biosensor based on the stationary mercury-film covered silver electrode. The biosensor has been used to devise a new variant of solid-phase immunoassay of auto-antibodies (Ab) in blood serum without separation of components. The content of auto-Ab was monitored by measuring the currents of catalytic hydrogen evolution (with potentials of -1.2 and -1.4V) resulting from the complexing of Pt(II) with DNA or auto-Ab respectively. The determination has been performed within a wide concentration area of  $5.0 \times 10^{-10}$  to  $7.0 \times 10^{-8}$  M. The limit of detection is  $3.0 \times 10^{-10}$  M. The affinity constants for the immunoreaction of DNA-antibodies have been found to be  $1.25 \times 10^9$  and  $2.50 \times 10^8$  M<sup>-1</sup>, which confirms the specificity of the interaction. The protocol of the immunoassay has been proposed and the procedure of diagnosing Aleutian mink disease (AMD) has been described here. © 2003 Elsevier B.V. All rights reserved.

<http://dx.doi.org/10.1016/j.aca.2003.09.057>

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### Keywords

Amperometric biosensor, Auto-antibodies, DNA, Immunoassay, Platinum complexing