

RECOMBINANT FAB ANTIBODY SPECIFIC FOR COPLANAR POLYCHLORINATED BIPHENYLS, AND HAPTENS FOR PCB CONGENER

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ABSTRACT

Recombinant Fab antibodies (rFabs) specific for coplanar polychlorinated biphenyls (PCBs) were derived from a hybridoma cell line (Chiu et al. Anal. Chem. 1995, 67, 3829-3839). Immunoglobulin V(H)-C(H1) and V(L)-C(L) sequences from S2B1 messenger RNA were amplified by PCR and cloned into the M13 phagemid vector pComb3H. Phage displaying rFab were enriched by panning on a PCB hapten conjugate and expressed as soluble rFabs in Escherichia coli XL-1 Blue. Two rFab clones competitively bound PCBs 77 and 126 with half-maximal inhibition (I(50)) of 10-13 ppb in indirect and direct enzyme immunoassays (EIAs), with selectivity nearly identical to that of whole S2B1 IgG and its Fab fragments prepared by papain digestion. These results, and comparison of N-terminal amino acid sequences of MAb S2B1 and the rFab, indicated that rFab S2B1 is a functional copy of the MAb. The rFab S2B1 sequences have 75-89% sequence identity with antibodies that bind nitrophenyl haptens and are being used to construct a three-dimensional computational model of the PCB binding site.

Reference: Chiu, YW, et al. 2000. J Agric Food Chem. 48:2614-24

APPLICATIONS

This rFab is useful in immunoassay and sensor devices.

The antibody may be used in immunoaffinity techniques for concentration and cleanup of PCB residues.

Also disclosed is are new haptens that mimic PCB77 and non-coplaner PCBs having one or two chlorines at ortho positions on the biphenyl rings.

ADVANTAGES

The new haptens facilitate the recovery of engineered variants of rFab S2B1, and derivation of recombinant antibodies with different properties using phage display, or other combinatorial library techniques.

RELATED TECHNOLOGIES

- [Monoclonal Antibodies And Immunoassay Specific For The Toxic Congeners Of Polychlorinated Biphenyls](#)

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OTHER INFORMATION

KEYWORDS

antibody, research tool, reagent

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