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A TERBIUM-160 PROBE OF THE NICOTINIC BINDING SITE OF THE ACETYLCHOLINE RECEPTOR FROM TORPEDO CALIFORNICA

Trivalent terbium, which is known to be able to substitite for Ca(II) at specific sites on the acetylcholine receptor was used here as a probe of the nicotinic binding site of the acetylcholine receptor from Torpedo californica. In this paper, the ability of various ligands to displace ^{160}Tb(III) bound to the acetylcholine receptor from Torpedo californica is described. Specifically, ligand-induced ^{160}Tb(III) displacement was followed in a specially designed flow dialysis apparatus, coupled to a NaI(Tl) γ-ray scintillation spectrometer. This displacement was monitored as a function of (1) the concentration of nicotinic ligand (i.e., acetylcholine chloride) in the "wash-out" buffer and (2) the nature of the nicotinic ligand in the buffer (e.g., acetylcholine chloride, tetraethylammonium bromide and nikethamide). Measured ^{160}Tb(III) exchange half-lives indicate (1) a direct relationship between ^{160}Tb(III) displacement and nicotinic ligand concentration in the "wash-out" buffer and (2) an enhanced ^{160}Tb(III) displacement for nicotinic agents possessing quaternary ammonium functions (e.g., acetylcholine chloride and tetraethylammonium bromide) versus neutral ligands (e.g., nukethamide).

Lancione, G. V., Nelson, D. J., and Wright, G. M.

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From the Department of Chemistry, Jeppson Laboratory, Worcester, Mass., and the Department of Pharmacology, University of Massachusetts Medical Center, Worcester.

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