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Histochemical demonstration of an additional form of rat brain MAO

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Monoamine oxidase (MAO) is known to exist in a number of forms, and in the rat brain two types (A & B) have been described by Johnston (1968). Type A-MAO deaminates 5-HT and tyramine and is highly sensitive to inhibition by clorgyline, while the B form deaminates tyramine but not 5-HT and is relatively insensitive to clorgyline. These different forms may well be of considerable importance in the metabolism of monoamines in mammalian brain, and may well have differing distributions (Collins, Sandler, Williams & Youdim, 1970; Goridis & Neff, 1971).

A histochemical method has been developed which permits the demonstration of MAO in rat brain, using both 5-HT and tyramine as substrates. Using clorgyline as an inhibitor A- & B-MAO have been separately demonstrated. Both types are broadly distributed in the rat brain, with a basically similar distribution. Both are present in high amounts in areas known to be rich in monoamines.

A third type of MAO which readily utilizes 5-HT as substrate but is relatively clorgyline insensitive has also been demonstrated. It is predominantly circumventricular in distribution. It is suggested that this form, differing from A- & B-MAO not only in substrate and inhibitor characteristics, but also in distribution should be designated C-MAO. Its distribution suggests a potentially important role for this form of MAO in regulating the movement of biogenic amines between the CSF and the brain.

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Some studies on the purification of monoamine oxidase by affinity chromatography

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Partially purified preparations of monoamine oxidase (MAO) have been prepared by a number of workers (Youdim & Sourkes, 1966; Tipton, 1968; Oreland, 1971) using conventional purification procedures which utilize differences in the chemico-physical properties between MAO and other proteins. Over the past few years affinity chromatographic techniques have been developed using selective adsorbents which have biological affinity for a particular protein and this technique has been utilized to purify enzymes (Cautrecasas, Wilchek & Anfinsen, 1968; Wilchek & Gorecki, 1969).

In the present experiments a number of inhibitors of MAO were used as ligands and were attached to sepharose columns in an attempt to purify MAO by a single step experimental procedure.

An organomercurial-sepharose column was prepared by utilizing p-chloromercuribenzoate as the ligand. p-Chloromercuribenzoate was added to aminohexane sepharose suspended in 40% dimethyl formamide. 1-Ethyl-3-(3-dimethylamino propyl) carbodiimide was added, the pH maintained at 4.8 and the mixture allowed to react