FLUORESCENCE MICROSCOPY OF CATECHOLAMINE-DERIVED TETRAHYDRO-ISOQUINOLINE ALKALOIDS FORMED DURING METHANOL INTOXICATION.
Gerald Cohen & Robert Barrett*. Columbia Univ., NYC 10032.

Formaldehyde condenses with catecholamines to form tetrahydroisoquinolines (TIQs) which can be further oxidized to fluorescent dihydroisoquinolines (DIQs); these reactions form the basis for the histochemical localization of catecholamines in nerve tissue (reviewed by Corrodi & Jonsson, J. Histochem. Cytochem. 15, 65, 1967). We used fluorescence microscopy to detect isoquinolines formed *in vivo* when methanol was metabolized to formaldehyde. In preliminary experiments, cow adrenals were perfused with 0.08% (w/v) formaldehyde. The presence of TIQs in adrenal extracts was demonstrated by thin-layer chromatography. When slices of freeze-dried adrenal tissue were heated to 80°C, the TIQs were converted to DIQs which could be observed under the microscope as a consequence of their characteristic green fluorescence. In subsequent experiments, Columbia-Sherman rats received 3-day, multiple, i.p. injections of 1-4gm methanol/kg in saline. Freeze-dried portions of the adrenal medullae from experimental animals, but not from control animals, showed a heat-induced green fluorescence. These results indicate *in vivo* synthesis of TIQs. The biosynthesis of TIQ alkaloids in adrenal and nerve tissue may contribute to behavioral changes during ingestion of methanol. (Supported by Grants HE-01045 and NB-05184 of the U.S. Public Health Service.)

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164 *Pharmacology*

METABOLIC REQUIREMENTS FOR CATECHOLAMINE SECRETION FROM THE ADRENAL MEDULLA. R.P. Rubin, Dept. of Pharmacology, State Univ. of N.Y., Downstate Medical Center, Brooklyn, N.Y.

The metabolic requirements for catecholamine release have been studied on acutely denervated cat adrenal glands perfused with Locke's solution. Spontaneous secretion was enhanced during perfusion with media lacking both glucose and oxygen. Nitrogen (N_2) or glucose deprivation alone did not depress the secretory response to acetylcholine (ACh) or to calcium (Ca^{+2}) plus high K^+. N_2 plus glucose deprivation when imposed together did depress the response to a high dose of ACh, but not to a low dose of ACh or to Ca^{+2}. Simultaneous inhibition of oxidative metabolism and glycolysis produced either by N_2 plus iodoacetate or cyanide plus glucose deprivation markedly depressed Ca^{+2}-evoked secretion. Differential analysis showed that during anoxia, output was maintained primarily by epinephrine secretion. During anoxia glycogen content of medullae was profoundly reduced. It is concluded that energy derived from either glycolysis or oxidative metabolism is directly required for the secretory action of Ca^{+2}. The data presented also suggest that anoxia may regulate medullary secretion through a peripheral as well as a central mechanism (Supported by USPHS Grant AM 09237).

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165 *Biochemistry*

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Federation Proceedings 28:288 (1969).

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