The occurrence of cysteine sulphinate decarboxylase in brain enzyme. Indeed the antiserum gave positive results by tissues for reaction with antiserum against the brain of cerebral cortex, olfactory bulbs and retina, gave a positive pons, hypothalamus, striatum, midbrain, hippocampus, regions and other tissues.

All brain regions, as dissected according to Glowninski & Iversen (1966), namely cerebellum, medulla oblongata andpons, hypothalamus, striatum, midbrain, hippocampus, cerebral cortex, olfactory bulbs and retina, gave a positive reaction with the antiserum by double immunodiffusion.

As a cysteine sulphinate decarboxylase has been known for a long time to occur in liver, we also checked peripheral tissues for reaction with antiserum against the brain enzyme. Indeed the antiserum gave positive results by immunodiffusion with liver, pancreas, kidney, skeletal muscle and a faint reaction with heart homogenate. To exclude an unspecified reaction we reacted the antiserum with a purified preparation of rat liver cysteine sulphinate decarboxylase according to Glowninski-Iwersen (1966), namely cerebellum, medulla oblongata and pons, hypothalamus, striatum, midbrain, hippocampus, cerebral cortex, olfactory bulbs and retina, gave a positive reaction with the antiserum by double immunodiffusion. As a cysteine sulphinate decarboxylase has been known for a long time to occur in liver, we also checked peripheral tissues for reaction with antiserum against the brain enzyme. Indeed the antiserum gave positive results by immunodiffusion with liver, pancreas, kidney, skeletal muscle and a faint reaction with heart homogenate. To exclude an unspecified reaction we reacted the antiserum with a purified preparation of rat liver cysteine sulphinate decarboxylase according to Glowninski & Iversen (1966). The reaction was positive; thus peripheral and brain cysteine sulphinate decarboxylases are closely related, if not identical.

These results are in accordance with the comparison of the biochemical properties of brain and liver cysteine sulphinate decarboxylases made by Oertel et al. (1981), who had no antiserum to confirm the close relationship between both enzymes, and with the situation in bovine brain where a specific cysteine sulphinate decarboxylase is also present (Wu, 1982).

The relationship of cysteine sulphinate decarboxylase in brain and peripheral tissues again poses the problem of the function of taurine. It is not clear at present if taurine has the same unknown function in brain as in peripheral tissues, or if it could also have a transmitter role in some neuronal cells. The immunohistological localizations of the decarboxylase in cerebellum and neuromuscular junction (Chan-Palay et al., 1982a,b) do not permit a choice to be made between the two proposed functions.


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Analytical subcellular fractionation of insect central-nervous-system tissue

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The central nervous system (CNS) of the cockroach (Periplaneta americana) is extensively used for studies on insect neuropharmacology. The morphology of central synapses in the cockroach has been described (Wood et al., 1977) and evidence for cholinergic synapses on identifiable central neurons has been presented (Sattelle, 1980). Hence, previous attempts to isolate a subcellular fraction rich in nerve terminals from the CNS of cockroach by means of sucrose gradient centrifugation were unsuccessful (Telford and Matsumura, 1970). The use of a Ficoll gradient fractionation method produced a subcellular fraction enriched in synaptosome-like structures from locust CNS (Breer, 1982). We describe here an analytical approach in which marker enzymes and other neuronal constituents were determined in all fractions obtained following differential centrifugation. The synaptosomes were collected in phosphate-Ficoll gradients without contamination with the supernatant and the functional integrity of isolated synaptosomes was shown by a high-affinity, Na+-dependent uptake for [3H]choline and its subsequent acetylation to [3H]acetylcholine.

The brain thoracic and abdominal ganglia were excised from adult males of Periplaneta americana. All operations were performed in ice-cold 0.25M-sucrose buffer containing 0.1M-Tris/HCl and 1.0mM-EDTA (pH 7.4). The tissue was homogenized with five to seven passes in a Teflon glass homogenizer and centrifuged for 15 min at 800g (av.). The pellet was homogenized twice with the buffered sucrose solutions and centrifuged. The combined supernatant was centrifuged for 20 min at 17000g (av.). The pellet was resuspended in a small volume (0.1 ml) of sucrose buffer and gently homogenized. Ficoll solution (10% w/v in sucrose...