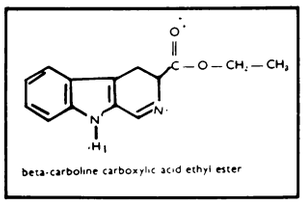
BIOLOGY

Anxiety over natural Valium compound



beta-carboline carboxylic acid ethyl ester

Announcement of a natural chemical that may share brain receptor sites with anti-anxiety drugs Valium and Librium has created tension between scientists. Claus Braestrup of a Danish pharmaceutical company last November announced that he had isolated from urine a compound that binds more tightly than Valium to those receptors and suggested that it is a natural anti-anxiety agent (SN: 11/10/79, p. 325). However, Richard Squires, who was working with Braestrup at the start of the project a few years ago, says the tightly binding compound is just an artifact of the chemical isolation procedure. "That compound itself does not exist *in vivo,* certainly not in the brain," says Squires, who is now at Rockland Institute in Orangeburg, N.Y.

Braestrup would not reveal the structure of the chemical he calls "gamma-compound," but Squires says it is a substance known as a beta-carboline carboxylic acid ester. According to Squires, this chemical does not occur naturally, but rather it appears when urine is boiled with alcohol in acid during purification. "It may be derived from something interesting," Squires told SCIENCE NEWS. But its precursors have not yet been identified. One possibility, which Squires suggests, is that beta-carboline is contained in a crucial peptide in the brain.

Another point of contention is whether a beta-carboline carboxylic acid ester would be active in the body. Squires claims that such chemicals are broken down rapidly by natural enzymes. "It would have no value *in vivo,*" he says.

So in the search for improved anti-anxiety drugs, those scientists hoping to use natural agents as their models have not given up their favorite candidates, such as purines (SN: 12/16/78, p. 424). Others are working on metabolically stable derivatives of beta-carboline. With tension mounting, the anti-anxiety race is still on.

Biochemistry for a plant hormone

The natural growth regulator ethylene plays a wide variety of roles, from germination to senescence, in plant life. It affects growth, flowering, dormancy, leaf loss and sex expression. Yet the chemistry of its influence is poorly understood. In the plants, not even the receptors for hormones have been identified.

As a first step to unraveling ethylene's action, researchers at E. I. du Pont de Nemours and Co. in Wilmington, Del., now have demonstrated early biochemical events in ethylene action. Dale C. Blomstrom and Elmo M. Beyer Jr. report in the Jan. 3 NATURE that in pea seedlings ethylene is converted to ethylene glycol (also called 1,2-ethanediol), a replacement of two hydrogen atoms with hydroxyl groups. Ethylene glycol is a reasonable stepping stone toward carbon dioxide, the end product of ethylene metabolism so far described in plant tissues.

The scientists also have identified another intermediate along the metabolic path. After ethylene glycol production, glucose is attached to the molecule to make a sugar conjugate. If pea seedlings are exposed to propylene, a chemical that mimics the natural hormone ethylene, 1,2-propanediol and gluclose-propanediol conjugate are produced in the reactions that normally handle ethylene. Blomstrom and Beyer have observed the same pattern of metabolism in a variety of plant tissues that respond to ethylene. The responsive tissues examined include carnation ovaries, morning glory flowers and tomato fruit. Because ethylene metabolism is inhibited by silver ions and carbon dioxide, which also interrupt ethylene's regulatory effects, the metabolism seems to be linked directly to hormonal action.

ENERGY

West-to-East pipeline approved

Future West Coast surfeits of oil may find their way to crude-short midwestern and eastern users as a result of President Jimmy Carter's decision to approve construction of an oil pipeline from Port Angeles, Wash., to Clearbrook, Minn. The approval granted the Northern Tier Pipeline Co. on January 17 is conditional upon the consortium's ability to secure financing for the 1,500-mile system and approval by the Washington State Energy Facility Siting and Evaluation Council.

Construction, estimated to require two years and $1.6 billion, would be financed privately by Northern Tier's nine members. Expected to deliver 900,000 barrels per day, the pipeline would connect inland pipelines, refineries and users with the "lower 48" tanker port closest to oil fields in Alaska, Indonesia and the Pacific Basin. But should financing or approval of Northern Tier's proposal fall through, runner-up Trans Mountain Oil Pipeline Corp. will become eligible for the same preferential procedural and other opportunities granted Northern Tier (under Title V of the Public Utility and Regulatory Policies Act of 1978) by the President's move.

Drive to boost alcohol fuels

Quadrupling by year end the United States' current gasohol production capacity—now about 800 million gallons annually—is among a series of goals contained in a presidential directive announced January 11. Other key elements in the package to boost production of alcohol fuels are proposals to:

- extend permanently the current 4-cent-per-gallon federal excise tax on gasoline (Since gasohol is a mix of nine parts unleaded gasoline and one part alcohol, the measure actually affords a 40-cent-per-gallon subsidy for ethanol producers. This exemption is now due to expire in 1984.);
- create a $3 billion, 10-year program of loans and loan guarantees for construction of small- and medium-scale alcohol and biomass-production plants to be located mainly on farms (Backyard distillers beware: Plants must be licensed.);
- channel up to $1 billion in funds from the proposed national Energy Security Corp. to assist construction of biomass-derived fuel plants.

In spelling out some details of the program, Deputy Energy Secretary John C. Sawhill said the ultimate goal is the production of 500 million gallons of ethanol for gasohol by 1981. He said that should be sufficient to meet 10 percent of the anticipated demand for unleaded gas.

Older cars with high-compression engines will probably benefit most from gasohol, according to Harry B. Weaver of the Motor Vehicle Manufacturers Association's engineering division. "Since gasohol has a higher octane rating, it is better suited for older engines designed for use with premium fuel," he said, adding that gasohol might also improve slightly the fuel economy and overall performance of these vehicles.

Nuking for oil

The Soviet Union may have used an underground nuclear explosion last fall to prod a reluctant oil field into production, say two researchers of the U.S. Geological Survey. According to Jack Rachlin and James W. Clarke, the location of a seismic event on Oct. 4, which was described by the Department of Energy as a nuclear explosion, puts it in the Salym oil field in West Siberia. The field is made of tight bituminous shale that does not allow the free flow of oil, Rachlin explained. A nuclear explosive, which is smaller than conventional explosives and can be dropped down a narrow drill hole, may have been used to increase the number of fractures, he said.