

Amphetamines found to cause permanent brain damage

By Charles Culhane

WASHINGTON, D.C.—A research team studying the neurotoxicity of amphetamines and their derivatives has demonstrated that many of these drugs produce long-term, possibly irreversible changes in certain neurotransmitter systems of the brain.

"Since many of these drugs are widely abused, it is important to know whether they produce neurotoxic effects at dosage levels equal to those commonly found on the streets," said Dr. Charles Schuster at a Science Press Seminar here.

Dr. Schuster and Dr. Lewis Seiden, his colleague, both of the Department of Psychiatry at the University of Chicago, have been studying methamphetamines and their derivatives under a grant from the National Institute on Drug Abuse.

"Methamphetamine and MDA have for some time been reported to be neurotoxic, and now the neurotoxicity of MDMA has been demonstrated," Dr. Schuster said. MDMA is known on the street as "Ecstasy."

"We have also investigated some of the amphetamine analogs, or so-

called "designer drugs," such as MDA and MDMA, using behavioral, neurochemical and morphological procedures," Dr. Schuster said.

"In rats, both MDMA and MDA were substituted for amphetamine. In other experiments, using LSD as the training drug, it was shown that both MDA and MDMA produce LSD-like discriminative stimulus effects."

Dr. Schuster said that the experiments are significant in two respects: First, they provide information on the dosages necessary to produce subjective effects which can be compared to the minimal doses producing neurotoxicity; and, second, the fact that MDA and MDMA produce some subjective effects similar to those of amphetamines or LSD helps to account for their popularity as drugs of abuse.

"The data strongly indicate that serotonin neurons in the hippocampus are destroyed as a result of the drug," he said. "Thus, MDA is an extremely potent serotonin neurotoxin."

"It is important to note that doses producing neurotoxicity are very close to those producing amphetamine-like and LSD-like subjective ef-

fects. This suggests that, in order to produce significant psychological effects, humans may very well be exposing themselves to neurotoxic doses of MDA."

He said that he and Dr. Seiden also have completed studies of the neurotoxicity of MDMA.

"It would appear from these animal studies that MDMA has a neurotoxic potential in humans," Dr. Schuster said. "Further, this compound has not been systematically investigated for efficacy in the treatment of mood or behavioral disorders, even though some claim that the drug is useful for this purpose."

"The evidence purporting to show its efficacy has not been established by appropriate studies such as double-blind procedures comparing placebo to MDMA. Such studies are essential because, in the clinical situations where the drug has been employed, there are a multiplicity of variables confounded with taking the drug."

"The data suggesting that MDMA is an effective psychotherapeutic agent seem weak," he said. "Furthermore, laboratory studies suggest that the drug could harm serotonin cells in the brain."

Research findings link alcohol, violent acts

A GOVERNMENT research project on the neurochemistry underlying violent behavior has produced evidence that alcohol abuse may exacerbate neurochemical events associated with violence.

Dr. Markku Linnoila, clinical director of the National Institute on Alcohol Abuse and Alcoholism, described the project at a recent Science Press Seminar sponsored by the U.S. Alco-

turbances of the biological rhythms in human beings. "These disturbances are associated with aggressive outbursts," he said. "The self-medication with alcohol, however, may lead to further worsening of the primary problem—a deficient serotonergic neurotransmission."

—Charles Culhane