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## Endorphins for emotions: A good beta

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"We're probably setting psychiatry back 100 years," says Nathan S. Kline, "but there's nothing we can do about it." When one considers that the age of specialization has not bypassed psychiatry, Kline's tongue-in-cheek observation may have a ring of truth to it. After all, he notes, the discovery that one compound appears to help two distinct psychiatric problems — depression and schizophrenia — is somewhat inconsistent with current trends of treating each of the two conditions with distinct, specialized drugs.

But in a follow up of work presented last year (SN: 9/17/77, p. 182), Kline reports that beta-endorphin — a naturally occurring protein in the brain — is surprisingly effective in trials with both depressives and schizophrenics. Moreover, some chronic schizophrenics have, in effect, recovered, and continue to improve more than 10 months after their last beta-endorphin injection, Kline reported at an American Psychiatric Association regional meeting in New York City.

"There is very little doubt at the moment that, for whatever reason, beta-endorphin is effective [in depression and schizophrenia]," Kline says. For a number of reasons, however, he estimates it will be two or three years before the treatment is available on a clinical, nonexperimental basis. The primary drawback is the cost — about \$3,000 per injection. A number of

drug companies, primarily in Europe, are currently working on cheaper ways to produce the compound, according to Kline, director of the Rockland Research Institute in Orangeburg, N.Y.

Another problem is that the improvement with depressed persons, while dramatic, lasts only four to six hours — that's more than \$500 an hour. This was surprising to Kline, who believed that since the compound seems to attack cells in the amygdala portion of the brain, it would influence affective disorders, such as depression, more readily than schizophrenia. But he found that though the injection triggered sharp mood rises in seven depressed persons within two to three minutes, the improvement lasted only a few hours.

The half-dozen schizophrenics tested, however, continue to live relatively normal lives more than 10 months after receiving seven beta-endorphin injections over a three-month period. The group includes one man who had been almost totally nonfunctional for 15 years and is now living on his own and working at a regular job, Kline says. He suggests that the balance of beta-endorphin "may be the body's own way of managing mood swings" and that developing the compound as a standard treatment could provide "something more rapid than present-day treatments." □

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## Inadequate equipment threatens U.S. R&D

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President Jimmy Carter's aim to stabilize or even lower inflation by reducing government spending will likely not involve cutting research and development budgets. According to the Washington Post, Carter signaled his intent to White House aides in a memorandum last week, saying, "I want to maintain our strong support for R&D as [percentage] of budget." Whether this means R&D will be exempt from federal-spending restraints or not, however, may depend on the nation's response to the voluntary anti-inflation program that Carter proposed, his aides say.

Carter's R&D support was handwritten in the margin of a memo sent to him a week earlier by his science advisor, Frank Press. Press and James J. McIntyre, director of the Office of Management and Budget, were seeking Carter's guidance on plans for the (fiscal year) 1980 R&D budget.

The same day Carter passed on his R&D memo, a committee of scientists met in Washington with Carter advisors to discuss what might be done to increase the share of R&D funds devoted to instrumentation. The United States is falling behind other nations in terms of the rate at which scientific work is done and in the general

competence of its researchers, the scientists charged. They cited an "accelerating decline in the quality, quantity and development of scientific instruments available for research" as a primary reason why.

A year ago, Press and OMB's Bowman Cutter said the same thing in a memo to the President. Although Carter approved their accompanying recommendation that more funds be channeled into instrumentation, the ad hoc committee on instrumentation that met with Press, OMB and others last week said this recommendation is "threatened" by the current economy.

Instrument-replacement costs have risen sharply over the last decade, as have demands for instrumentation because of expanded applications. Meanwhile, there has been a decrease in available equipment funds resulting from a 19 percent decline in constant-dollar federal-research expenditures and from increased pressures to maintain ongoing research despite increasing costs for workers and supplies. Because inflation of instrument costs exceeded 100 percent in many cases during this period, the scientists say the net decrease in instrumentation funding

"exceeds by far the estimated 19 percent decline in the support of basic research."

The ad hoc committee believes that in the present economic climate, "attempts will undoubtedly be made to solve the problem by mandating that each funding agency devote a larger fraction of its constant or declining budget to instrumentation." But if the money earmarked for instruments shortchanges the budget for the personnel and supplies needed to use them effectively, the result amounts to little more than substituting one debilitating problem for another, they say. Instead, money should be spent on increasing and creating new opportunities to share technological resources, the ad hoc committee says. The cost of sharing expensive (\$100,000 or more) equipment is less than the cost of duplicating such equipment at several facilities.

Facilities housing such equipment, however, often are not compensated for the additional maintenance and repair, extra trained personnel and round-the-clock supervision required of equipment used by other than the principal researchers. Provision for such extra costs would increase the efficiency and effectiveness of existing advanced instrumentation centers, the ad hoc committee says, and should be ensured.

Stanford University's Oleg Jardetsky and other directors of regional instrumentation facilities on the ad hoc committee say the problem is acute in chemistry and biology. This research is generally performed by a single faculty member and students at a university, they say, on relatively small grants — grants too small to pay for instrumental technological advances that could increase the quality of their research. □

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## Safer diagnosis for sickle cell anemia

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Two years ago, Yuet Wai Kan and his genetics team at the University of California in San Francisco made a major advance in the prenatal diagnosis of inherited diseases. They diagnosed sickle cell anemia in living human fetuses (SN: 5/22/76, p. 325). The technique, however, required great obstetrical skill and carried the threat of a seven percent risk of fetal death, since the sickled hemoglobin peptide chain that causes the disease could only be identified in red blood cells obtained from the fetus. Prenatal diagnosis of other genetic diseases, in contrast, can be carried out using any kind of fetal cell, thus making diagnosis a lot easier and safer.

Now, Kan and his colleagues have found that they can also use any kind of fetal cell to diagnose sickle cell anemia in fetuses, making sickle cell diagnosis much safer than with their initial technique. Their new method, reported in the Oct. 28 LANCET, makes use of enzymes that cut up DNA