In a 5-year, $4.3 million, multi-center study, a team of experimenters is investigating how chronic stress might lead to alcoholism. Abundant evidence, of course, has suggested that people who are vulnerable to addictions due to genetics or other factors might be especially at risk during times of stress. This latest study seeks to tease apart just why and how stress leads to the bottle.

Unfortunately, the research team, headed by Doug Matthews of the University of Memphis, has made a very disturbing choice. It is not looking at the sorts of stressors that typically affect people—marital problems, parenting challenges, chronic overwork, or sleep disruption. In fact, it is not looking at people at all. The scientists are stressing 6,000 mice, then giving them access to alcohol, hoping to “model” the human stress/alcohol link in rodents. In these highly invasive studies, mice will be exposed to inescapable shocks to their feet for 15-minute periods, forced to swim in a water maze until they find a submerged platform, tethered by electrodes drilled into their skulls, and deprived of food until they lose 15 percent of their weight. They will also have the ends of their tails amputated for genetic analysis.

There is no shortage of ethical ways to study substance abuse in humans. But animal tests continue, often explicitly abusing their subjects. In a recent study by investigators at the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute of Child Health and Human Development (NICHD), and the Swedish Medical Research Council, Stephen Suomi and colleagues used 97 monkeys, finding that those taken away from their mothers as infants exhibited more signs of stress later on, and, if offered alcohol, tended to take it more than other monkeys. This study, it could be argued, is not research, but simply a graphic illustration of pre-existing knowledge. As in the gruesome infant-separation experiments conducted by Harry Harlow, Suomi’s mentor, Suomi has taken a well-known human phenomenon—the association between disrupted early infant-parent relationships and later alcoholism—and illustrated it in animals.

Other examples abound in which animal studies are used to confirm phenomena already well known in humans. Carol Cunningham of Wake
Forest University is training monkeys to drink ethanol. He hopes they will develop irreversible liver damage and serve as an “animal model” for cirrhosis. James Ruth at the University of Colorado is exposing mice to nicotine and other drugs to study the detection of residues in their hair. Bethany Neal-Beliveau at Indiana University is teaching undergraduate students how to conduct alcohol research on animals. A 2002 review paper in the journal Pharmacology and Therapeutics describes methods to recreate alcohol relapse in rats and cites some 175 related studies, almost all using animals. A 2002 paper on relapse to heroin and cocaine-seeking in rats cites some 300 related animal studies.

In a recent study led by George Ricaurte of the Johns Hopkins University School of Medicine, five baboons and five squirrel monkeys were injected with the drug MDMA (“ecstasy”) at three-hour intervals. The study sought to replicate the kinds of doses taken by human users. Two of the animals died from their doses, and the remainder suffered severe damage to the region of the brain that transmits dopamine, a brain chemical that regulates movement. The report’s conclusions were swiftly and sharply criticized. Dr. Juan Sanchez-Ramos, Ellis Professor of Neurology at the University of South Florida, for example, notes that “the multiple dose regimen of injected MDMA administered to primates...does not predict anything about human vulnerability.”

The NIAAA and the National Institute on Drug Abuse (NIDA) fund most U.S. research on substance abuse using animals. In September 2002, NIDA announced the availability of an additional $2.5 million in 2003 to fund 7 to 12 new or continuing studies on “chronic stress and its relation to drug abuse and addiction.” While NIDA includes studies of chronically stressed humans in its funding solicitation, the announcement also encourages “using chronic or repeated stress manipulations in animals.”

A New Focus on Human Health

There are better ways. A wide range of ethical methods has been developed for studying substance abuse in humans, yielding results that are useful to clinicians. These methods include brain imaging, genetic studies, behavior modification trials, treatment assessments, population studies, and even trials that expose consenting participants to low doses of stress or recreational substances. Among the human studies currently being funded by NIDA and NIAAA:

- Massachusetts General Hospital’s Igor Elman is studying cocaine using magnetic resonance imaging (MRI) and other techniques to assess neural relationships between craving and stress in cocaine-dependent subjects.
- The University of Washington’s Susan Astley is using MRI to determine if prenatally alcohol-exposed children have chemical and structural brain damage.
- Washington University’s Laura Bierut is interviewing 2000 cocaine addicts and their relatives to assess individual and familial factors in the development and psychopathology of substance abuse.
- The University of Wisconsin’s John Curtin is examining human fear conditioning in intoxicated and non-intoxicated individuals by startling them in ways that do and do not require conscious thought.
- Florida International University’s Andres Gil is assessing a school-based intervention program to reduce alcohol and drug abuse and violent behavior in at-risk adolescents.
- The University of Vermont’s Magdalena Naylor is testing an automated telephone call-in service to prevent prescription drug abuse in patients with chronic pain.

Clinical researchers have already found that certain genetic traits amplify the effect of stress in humans. For instance, a particular gene was recently found to be associated with post-traumatic stress disorder among heavy drinkers. It is also known that some individuals are born with too few brain receptors for the neurotransmitter dopamine, and because dopamine is involved in the maintenance of normal mood states, these people may feel chronically empty or depressed. They often compensate by turning to alcohol, drugs, tobacco, food addictions, or compulsive gambling—anything to achieve the good feeling.

Many federally-funded studies have abused large numbers of animals, yielding nothing of value to clinicians.
that other experience normally. Further studies of human genetic traits—and how they translate into human problems—will be much more useful to researchers than animal studies.

Of course, there are other approaches, such as social and economic interventions, that go to the heart of the problem of drug abuse. A recent study found that a prevention program tested at 29 inner-city middle schools significantly decreased drug abuse. A study of 161 male clients in substance abuse therapy identified specific therapeutic strategies that improve response to treatment. These are just two examples of ongoing efforts aimed at addressing the problem, not merely describing it.

PCRM is calling on the NIAAA and NIDA to shift their focus. Rather than continue to encourage experimenters to stress animals and subject them to drugs or alcohol, it is essential to address the human condition directly using ethical and safe research techniques. Given the inherently abusive nature of animal studies and their uncertain application to humans, it is time for federal researchers to follow a better direction.

What You Can Do

Contact your Senator and Congressional Representatives. Ask them to insist that NIH use its ever-expanding budget for human health research, not animal abuse. You can find the names of your senators and representatives and their contact information by calling the Capitol switchboard at 202-224-3121 or by visiting www.Senate.gov or www.House.gov.
