Office of National Drug Control Policy
Counterdrug Technology Assessment Center (CTAC)

Counterdrug Technology

Advanced Systems to Help Law Enforcement and Medical Science in the Struggle Against Drug Crime and Abuse

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CTAC's Quest for Anti-Cocaine Medications

In the early 1990's, cocaine was destroying lives across America and medical scientists had few answers. President Bush asked whether it would be possible someday to develop a vaccine against cocaine addiction. At Columbia University's College of Physicians and Surgeons in New York City, Don Landry, M.D., Ph.D., heard the President's words as a challenge and developed a radical idea: Create a medication that would circulate harmlessly inside the blood stream waiting to attack and destroy entering cocaine molecules, breaking them apart before the cocaine could get to the brain where cocaine becomes a powerful, addictive intoxicant. Dr. Landry believed that such a medication could cripple cocaine's power with a single injection, serving as a true vaccine against this form of addiction. According to his theory, the same medication would also be an effective antidote for cocaine overdose.

But Landry's idea was so starkly different from the then-mainstream research paths that it was rejected by the usual funding sources. Nevertheless, cocaine was penetrating much of U.S. society and there was (and still is) no medication available to treat cocaine addicts. The White House Drug Czar's high tech R&D unit, CTAC, was eager to see a treatment breakthrough on cocaine and was mandated by Congress to be open to new thinking. So CTAC provided research funds to launch Landry's potentially historic work. At roughly the same time, CTAC sponsorship also went to a few other brilliant scientists whose concepts held the possibility of desperately needed breakthroughs in the cocaine crisis.

Today, Dr. Landry has partially succeeded. He has created an artificial catalytic antibody that attaches to cocaine molecules as they enter the bloodstream at reaction rates that render cocaine inert in laboratory rats. Dr. Landry is working to sharply increase the reaction rates to make the medication effective for human beings. If he succeeds, he will have achieved his dream: a perfect blocker against the drug, "No matter how they ingest the cocaine, by smoking it as in crack, by inhaling it or by injecting it."

If Dr. Landry's medication can be made powerful enough to work in humans, it would give cocaine addicts a safe and effective way to begin new lives of sobriety—from behind a cocaine-proof wall. Recently, Columbia University signed a contract with a pharmaceutical manufacturer. The company will pay for a major portion of the next step in Dr. Landry's project.

"Laboratory rats treated with this antibody respond to cocaine the same way they respond to water and doses of cocaine that would otherwise kill them have no effect at all."

Dr. Don Landry,
Cocaine Vaccine Developer

TOP: Dr. Landry and an assistant in his lab at Columbia University in New York. BOTTOM: Landry describes how his artificial antibody attacks cocaine molecules in the blood stream, tearing them apart, rendering them inert.