



Enabling Development of a Fentanyl Vaccine

ADDRESSING OPIOID-RELATED OVERDOSES AND DEATHS

More than 70% of drug use-related deaths are connected with opioids including fentanyl, and more than 30% of those are caused by overdose.* While overdose risks can be addressed with medications such as naloxone, their limitations (such as requiring multiple doses and inducing withdrawal symptoms) have shifted the focus to the development of opioid vaccines for prophylactic and therapeutic use.

A PROPHYLACTIC, VACCINE-ENABLING SOLUTION

Researchers at HJF and collaborators have developed six novel fentanyl hapten (antigen) compositions that could serve as the basis for preparation of fentanyl vaccines. They contain a thiol linker that facilitates coupling of the fentanyl hapten to a carrier protein, thereby inducing formation of antibodies against fentanyl for passive immunization. Preclinical data demonstrated the efficacy of using the novel hapten compositions as vaccines to protect mice against fentanyl. Data also show the antibodies produced to be highly specific – they bind to fentanyl, but not to methadone, naltrexone, buprenorphine, or naloxone. Promising results also indicate a high antibody titer against fentanyl hapten compositions that increases post immunization.



APPLICATIONS

- Development of fentanyl vaccine therapeutics
- Research on opioid-related mechanisms

*Source: World Health Organization

SOLUTION ADVANTAGES

Antibodies induced by the novel fentanyl haptens prevent the adverse effects of fentanyl by binding to the drug in the bloodstream and impeding it from crossing the blood-brain barrier.

This is important since fentanyl binding to the μ -receptor in the brain leads to euphoria, and (in the case of overdose) respiratory depression and potentially death.

Therefore, a vaccine prepared from the fentanyl haptens could reduce or prevent fentanyl-related overdoses.

- **Preventive:** Reduces or slows opioid distribution in the blood and reduces the amount of unbound opioid that can reach the brain
- **Non-interfering:** Provides a prophylactic treatment that is not expected to interfere with other overdose treatment medications or endogenous neuropeptides
- **Robust:** Is expected to provide longer-lasting treatment than overdose medications alone due to the long life of antibodies produced and the promising long antibody titer demonstrated in animal testing
- **Specific:** Induces an anti-fentanyl immune response without also inducing an immune response to opioid addiction medications



DEVELOPMENT STATUS

Preclinical proof of concept completed

PATENT STATUS

Patent pending

LICENSING OPPORTUNITIES

HJF is seeking development partners and/or licensees for this technology.

CONTACT INFORMATION

For more information contact:
techtransfer@hjff.org

TRACK CODE

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6720A Rockledge Drive, Suite 100
Bethesda, MD 20817
P: 240-694-2000

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