



# Novel Peptides for Treating Cocaine Addiction And Pain



## The Problems

1. Drug addiction is a scourge of both developed and less-developed societies. The economic impact of drug addiction includes direct treatment costs as well as lost productivity and crime.
2. Neuropathic pain is a chronic pain condition caused by a primary lesion or dysfunction in the nervous system. It can be a consequence of many different insults, such as trauma, neuronal injury, infection or addiction to narcotics. Neuropathic pain has a significant adverse impact on life, health and functions and is difficult to treat.



## The Solution

Bar-Ilan and Ariel University teams have identified novel peptides for treating addiction and possibly pain. The peptides were shown to be specific agonists to the delta opioid receptor ( $\delta R$ ), which is directly involved in drug craving and pain. We bond the peptides to PEPnanoparticles which assist their passage across the blood-Brain-Barrier (BBB) after intranasal administration.



## The Commercial Benefit

- Our cutting-edge peptides more effectively penetrate the BBB, reach their target and eliminated cocaine craving.
  - Our peptides attenuate relapse to drug usage.
- The Commercial Benefit



## Market Potential

Global production of cocaine can be estimated for 2014 at 746-943 tons; those values are slightly higher than in the previous year. Global number of cocaine users in 2014 was 18.3 million. Additionally, a  $\delta R$  agonist might be used for neuropathic pain treatment. Neuropathic pain is estimated to affect 7 to 10% of adults globally; that is between 518 to 740 million people. The global neuropathic pain market was valued at US\$ 5.2 Bn in 2015 and was estimated to reach a market valuation of US\$ 5.4 Bn by 2016. The market is projected to expand at a CAGR of 5.6% during an eight-year forecast period 2016–2024 and reach US\$ 8.3 Bn by the end of 2024.



## Target Markets/Industries

- Pharmaceutical companies
- Addiction Research Laboratories
- Drug addiction organizations



## Intellectual Property

Granted Patent US 10,421,785



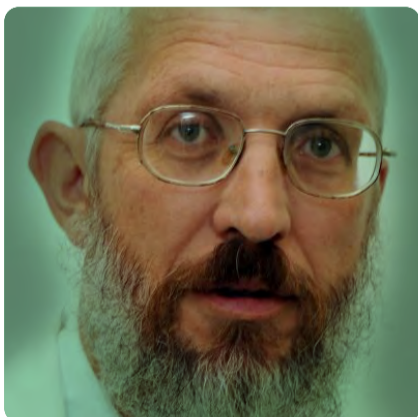
## Team: Primary Inventor

### Prof. Gal Yadid

- Prof. Yadid is best known for his research on the neuropsychopharmacological mechanisms behind psychiatric disorders.
- Yadid's research group focuses on developing pharmacological and non-pharmacological treatment modalities for psychiatric disease, specifically drug addiction, depression, and Post Traumatic Stress Disorder (PTSD).

### Prof. Michael Firer

- Prof. Firer received his Ph.D from Melbourne University, Australia working on the immunology of food allergy.
- After postdoctoral work at the Weizmann Institute of Science, he worked as an R&D Manager in the Israel biotech industry.
- Prof. Firer is currently Chairman of the Department of Chemical Engineering at Ariel University, Israel
- He serves as Director of the University's Interdisciplinary Cancer Research Center.
- His main research focus is the use of peptides for targeted drug delivery for cancer and other applications.



## Future Research

To promote our drug discovery and development to a new level, the utilization of animal and toxicity in vivo experimental models are required.



## The Opportunity

We are looking for investors that are willing to support the research and translating of this novel peptide to the clinic.



## Keywords

Neuropathic pain, Drug addiction, Chronic pain, Peptides, cocaine