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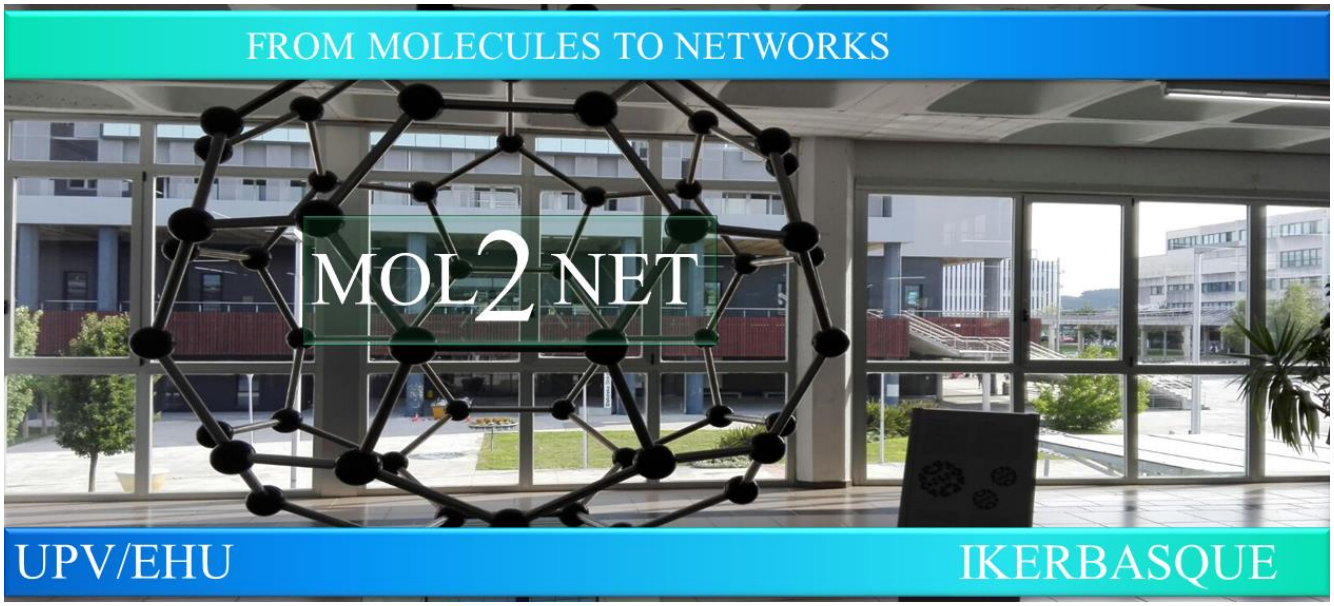

Findings on the Cocaine-vaccine efficacy in rats and in humans

Maider Baltasar Marchueta

Departamento de química orgánica e inorgánica, Universidad del País Vasco

Abstract.

Cocaine is the second most used illicit drug after cannabis in the general population. It is a powerful central nervous system stimulating agent and a highly addictive drug. In this review two different research made in cocaine-vaccine will be discussed.

Substance use disorder is a disease that affects a person's brain and behavior, resulting in the inability to control the use of legal or illegal medications or drugs. Cocaine is the second most used illicit drug after cannabis in the general population. It is a powerful central nervous system stimulating agent and a highly addictive drug. The somatic and psychiatric consequences of cocaine addiction are important and clinically relevant. Nevertheless, there are no medications that have regulatory approval for cocaine addiction at the moment. In this review two different research made in cocaine-vaccine will be discussed.

On the one hand, Kantak *et al.* [1] studied additional issues relevant to the clinical use of the vaccine IPC-1010 in rats. They performed two experiments: one experiment was conducted to address the issue of whether exposure to cocaine during the immunization period would influence the ability of the vaccine to block cocaine self-administration; and the second experiment was conducted to determine if the reductions in drug-seeking behavior and drug intake by the vaccine were behaviorally specific, or if behavior maintained by a non-drug reinforcer would be similarly affected. The results showed thay the cocaine vaccine IPC-1010 induced average serum antibody levels of 0.07 mg/ml and significantly reduced self-administration behavior. In fact, cocaine self-administration behavior significantly correlated with serum antibody level. These findings suggest that the reductions in drug-seeking behavior and drug intake after immunization with IPC-1010 did not result from a reduced ability of the rats to respond on the lever.

On the other hand, Kosten *et al.* [2] evaluated the immunogenicity, efficacy, and safety of succinyl norcocaine conjugated to cholera toxin B protein as a vaccine for cocaine dependence in humans. They performed a 6-site, 24-week Phase III randomized double-blind placebo-controlled trial assessed efficacy during weeks 8 to 16. Although for the full 16 weeks cocaine positive urine rates showed no significant difference between the three groups (placebo, high, low IgG), after week 8, more vaccinated than placebo subjects attained abstinence for at least two weeks of the trial, and the high IgG group had the most cocaine-free urines for the last 2 weeks of treatment. Only partially replicated the efficacy found in the previous study based on retention and attaining abstinence.

These findings suggest that the reductions in drug-seeking and drug-intake behavior of the rats after immunization with the vaccine IPC-1010 are not due to a decreased ability of the rats to respond to the lever. These findings also confirm the need for a sufficiently high level of antibodies to mitigate the reinforcing effects of cocaine. Moreover, cholera toxin B vaccine is effective since it is possible to block cocaine and thus reduce the craving of the patients.

References

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