DIPARTIMENTO DI FARMACIA E BIOTECNOLOGIE

Life & Chemical Sciences Seminars

Epigenetic modifications and Ubiquitin-Proteasome System as druggable targets for drug addiction and neuropathic pain

Dott.ssa Francesca Felicia Caputi
Dipartimento di Farmacia e Biotecnologie

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Abstract
The interaction between genes and environment is responsible for altering developmental trajectories, thus lending vulnerability or resilience to mental diseases including addictive behavior. Similarly, chronic pain could also depend on the long-term exposure to environmental factors. Cortico-limbic structures regulate the stress response and represent the cross-road of these pathological manifestations, exhibiting an high degree of maladaptive plasticity. The presence of enduring effects caused by a persistent pain condition or due to illicit drugs exposure, has suggested the possibility that these conditions might cause persistent molecular phenomena that are engendered by long-lasting epigenetic, transcriptional, and translational alterations in the brain. At molecular level, epigenetic studies provide invaluable insights to elucidate the interaction among an individual's genome, the environment, and pain or addiction states. However, molecular mechanisms underlying the development of neuropathic pain and substance abuse phenotypes remain poorly understood. In this regard, some evidence indicate that the ubiquitin-proteasome system (UPS) represents a new druggable target among cellular mechanisms underlying both addiction and neuropathic pain.

Biosketch
Dr. Caputi has been involving in molecular studies in the neuropharmacology field since 2008 and she carried out her investigations at the FaBiT Department to assess the involvement of the opioid systems and epigenetic regulation factors in neuronal mechanisms related to drugs addiction and neuropathic pain. During her PhD program in Biotechnology, Pharmacology and Toxicology Dr. Caputi received a Marco-Polo fellowship for young investigator and spent 12 months at the Mount Sinai School of Medicine (New York City, US) to improve her skills in molecular neuropharmacology, in the laboratories directed by Prof. Hurd.
Dr. Caputi defended her PhD thesis on April 2012 under the supervision of Prof. Romualdi, and afterwards she continued the collaboration with Prof. Hurd moving to US once again as a visiting postdoc. She is the author of several Peer-reviewed publications and of a book chapter entitled: "Epigenetic approaches in neuroblastoma disease pathogenesis". Dr. Caputi has presented her results in several national and international scientific meetings winning awards for the best oral presentation in 2013 and in 2015. In 2016 Dr. Caputi was selected among the 10 best researchers for the project "Young Against Pain" and in the same year she was awarded with the Italian Society of Pharmacology (SIF)-Farmindustria prize for pharmacological research. At present, Dr. Caputi continues her scientific research and teaching tutorship activities at the FaBiT Department as postdoc (supported by SIF/Merck Sharp Dohme Corporation fellowship).

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