

Global Experts Meeting on

# Psychiatry and Mental Health

July 23-24, 2018 Rome, Italy

## The molecular side of Quadrato Motor Training: Implications for mental health

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Neurotrophins are closely related to stress, mental health and well-being. Initially synthesized as precursor proteins (pro-neurotrophins), they can influence both developing and mature neural circuits. For example, while pro Brain-Derived Neurotrophic Factor (proBDNF) and Nerve Growth Factor (NGF) are related to learning and neuronal plasticity, proNGF is related to nociception and neuro-degeneration. Levels of pro-neurotrophins are considerably changed in neurodegenerative pathologies such as Alzheimer's and Parkinson's diseases. In addition, stress was shown to suppress BDNF synthesis and exogenous administration of BDNF may produce an opposing response in some cases, emphasizing the importance of activating the body's own resources. To this aim, we utilized the Quadrato Motor Training (QMT), a specifically-structured sensorimotor training, which was found to increase alpha synchronization and improve spatial cognition, reflectivity, creativity, as well as emotion regulation and general self-efficacy. Our studies demonstrated that proNGF and proBDNF vary following several weeks of QMT practice and are correlated with improved creativity, which is closely related to mental well-being. Together, these results support the idea that QMT is a useful integrated training that may aid in enhancing physical and mental well-being. In the current talk, we will discuss the implications of combining cognitively challenging physical training for healthy development and aging.

### Biography

Sabrina Venditti is a Researcher at Department of Biology and Biotechnology "Charles Darwin", Sapienza University of Rome, Italy. She has started her research in the field of DNA structure and topology, focusing on DNA alternative conformations of gene promoter regulatory elements. Subsequently she approached the field of gene expression and of *in vivo* analysis of chromatin configurations in yeast nuclei. In particular she focused on epigenetic molecular mechanisms that regulate the biology of important chromosome structures such as the telomeres, investigating telomeric position effects and subtelomeric elements dynamics. Since 2011, she has moved to the field of human neuroscience with a specific focus on epigenetics with the aim of elucidating the molecular mechanisms that mediate the effects of quadrato motor training on creativity and well-being, in collaboration with Fondazione Patrizio Paoletti. She is a Teacher of Molecular Genetics and of Elements of Epigenetics and Epigenomics at Sapienza University of Rome.

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