UNITED RESEARCH FORUM
(CONNECT WITH RESEARCH WORLD)

International E-Conference on

PHARMACOLOGY & TOXICOLOGY

December 01-02, 2020 | Webinar

Alejandro Sánchez-Melgar*, José Luis Albasanz, Mairena Martín

University of Castilla-La Mancha, Department of Inorganic, Organic and Biochemistry. Ciudad Real, Spain

Resveratrol acts as Adenosine Receptors Agonist: Potential Benefits for Human Health

Resveratrol (RSV) is a natural polyphenolic compound occurring in plants such as peanuts, berries and red wine, among others. This phytochemical has shown multiple beneficial properties for human health, but the precise mode of action remain to be clarified. Therefore, the aim of this work was to investigate whether RSV was able to modulate adenosine-mediated signaling in vitro (rat C6 glioma cells) and in vivo (brain from SAMP8 mice). Our biochemical and computational analysis in C6 cells showed that RSV directly binds to adenosine receptors and acts as a non-selective agonist on these receptors. RSV-induced receptor activation can stimulate or inhibit adenylyl cyclase (AC) activity in a concentration-dependent manner. RSV also modulated gene expression and receptor levels of adenosine receptors, and their downstream AC pathway. Furthermore, RSV induced cell growth inhibition on C6 cells in a time- and concentration-dependent manner, cell cycle arrest and caspase-3 activation. Furthermore, pharmacological inhibition of A2A receptor partially mimicked the effects caused by RSV. On the other hand, long-term diet supplementation with RSV induced changes on gene expression as well as transduction pathways mediated by adenosine receptors in brain from SAMP8 mice. RSV increased levels of A1 receptor, whereas no changes on A2A receptors were detected. Concerning their functionality, A1 receptor was found to be potentiated, however, A2A receptor was desensitized after RSV supplementation. In addition, 5'-Nucleotidase and Adenosine Deaminase were reduced by RSV, suggesting an alteration on adenosine metabolism. In conclusion, our results indicate that RSV modulates adenosine-mediated signaling in both *in vitro* and *in vivo* models. Therefore, new therapeutic strategies involving resveratrol and adenosine receptors should be aimed in the future for a variety of diseases such as cancer and neurodegenerative diseases.

Keywords: Resveratrol, Adenosine Receptors, GPCR, Neurodegeneration, Cancer.

Biography:

Alejandro Sánchez Melgar is a Assistant professor of Biochemistry/Department of Inorganic, organic and biochemistry/University of Castilla-La Mancha. He graduated in Biology and recently received my doctoral degree by the University of Castilla-La Mancha in 2017. I am author of 6 research paper since 2017. My research interest lies on how natural polyphenols such as resveratrol can benefit human health, particularly cancer and neurodegenerative diseases. In this line, my work is mainly focused on how adenosine-mediated signaling, a key regulator of the neurotransmission, is affected in the neurodegeneration process, with special emphasis on how resveratrol modulates adenosinergic system.