

# Cell Culture Technique in Immunology: Considering the *In Vivo* Influencing Factors

## Opinion

Cell culture represents an important aspect of the biological and medical research in both mechanisms studies and pharmacological evaluations [1,2]. It allows studying the cellular and molecular aspects within a certain context. However, cell-based tests allow the study/ evaluation of parameters within a limited context compared to the *In Vivo* conditions. Indeed, under the *In Vivo* conditions the immune system is a part of a network that includes also other systems such as the hormonal system and the nervous system [3]. Each one of the systems is in a continuous interaction with the other systems and within the same system continuous interactions have also been reported. These interactions could influence parameters such as cell growth, expression of certain receptors and the metabolic activities.

Therefore, the cell cultures on which immunological studies are based might not be fully extrapolated due to the differences in term of influencing factors between the cell cultures conditions and the *In Vivo* conditions including the hormones and the neurotransmitters. Thus, adding factors such as immune factors, hormones and neurotransmitters, to mimic the *In Vivo* conditions, within the cell culture medium used to cultivate the immune cells would better mimic the *In Vivo* conditions toward a better extrapolation for the obtained results especially with the consideration of the exogenous molecules [4,5] that can also influence the cells cultures of the immune cells.

The described concepts, although they have been defined for the cell cultures of the immune cells, are also applicable to the cells cultures derived from systems for which the constitutive cells are in continuous interactions either within the same system or with other systems.

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## Opinion

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**Abdelaziz Ghanemi**<sup>1,2,3\*</sup>

<sup>1</sup>Key Laboratory of Animal Models and Human Disease Mechanisms of the Chinese Academy of Sciences & Yunnan Province, Kunming Institute of Zoology, Chinese Academy of Sciences, China

<sup>2</sup>Kunming College of Life Science, China

<sup>3</sup>University of Chinese Academy of Sciences, China

**\*Corresponding author:** Abdelaziz Ghanemi, Key Laboratory of Animal Models and Human Disease Mechanisms, Kunming Institute of Zoology Chinese Academy of Sciences, No. 32 Jiaochang Donglu, Kunming 650223, China, Email: ghanemiabdelaziz@hotmail.com

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