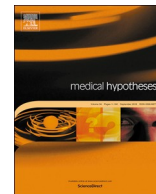




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Letter to Editors

May interferon λ be a novel therapeutic approach against COVID-19?

Corona Virus Disease 2019 (COVID-19) is a respiratory tract infection caused by an emerging β -coronavirus which is named Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-COV-2). Worldwide human to human swift transmission of the virus generated a global pandemic [1]. Noticing urgency, the World Health Organization (WHO) on 20 March announced a megatrial study named SOLIDARITY to re-purpose drugs that have already been in use for treatment of other viral diseases and malaria. One of the SOLIDARITY choices is a combination of two anti-HIV drugs plus interferon- β (IFN- β) [2].

Interferons are a family of cytokines best known for their anti-viral effects. They play a critical role in slowing down of viral multiplication. These cytokines are subdivided into three types. The type I IFNs (IFN- α/β) possess 13 members including IFN- α/β . The type II IFN has just one member, IFN- γ . The type III IFNs (IFN- λ) are made up of 4 members namely IFN- $\lambda 1$ to IFN- $\lambda 4$. According to the recent investigations all three types of interferons can either activate or regulate immune response [3,4]. Although type I and type III IFNs have even more immune activities in common, their functions are not fully redundant and IFN- λ s have specific characteristics which may make them an appropriate therapy against COVID-19:

- 1- While the expression of type I IFNs receptors are ubiquitous, the expression of IFN- λ receptors are limited to the tissues with relatively high numbers of epithelial cells such as lung, skin, gastrointestinal and respiratory tracts. This dual pattern of receptors distribution gives a unique potential to the IFN- λ family for tailored targeting special tissues [5].
- 2- The yin-yang concept is seen in each medicinal component. Application of both type I and type III IFNs is followed by a range of side effects [6]. Nonetheless, due to the restricted expression of the IFN- λ family receptors, fewer side effects would be expected. In addition, the type I IFNs have a central role in lung inflammatory response [7].
- 3- At mucosal surfaces IFN- λ family plays a significant role in driving anti-viral immune response [8].
- 4- During a mouse Influenza A infection, IFN- λ and not IFN- α was chiefly produced by intranasal epithelial cells [9].
- 5- In a mouse model, both IFN- λ and IFN- α could prevent Influenza virus replication, however, only IFN- λ could hinder spreading of the virus to the lung [10].

Previously, low-dose IFN- α prophylaxis could reduce the severity of

acute respiratory illness during an influenza pandemic [11]. It seems IFN- λ therapy could be advantageous during COVID-19 pandemic if it is locally administrated directly to mucosal barriers where the earliest anti-viral defense occurs with less inflammatory side effects. [12].

Declaration of Competing Interest

The authors declare that they have no conflict of interest.

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