Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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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 Sever 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 repurpose 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-λ1 to IFN-λ4. 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-λs 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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