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Non-specific anti-viral approach towards Ebola virus infection: a comment on "Against Ebola: type I interferon guard risk and mesenchymal stromal cell combat sepsis"

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The recent "Viewpoint" by Zhang *et al*. (2015) entitled "Against Ebola: type I interferon guard risk and mesenchymal stromal cell combat sepsis", published in *Journal of Zhejiang University-SCIENCE B (Biomedicine & Biotechnology)*, is very interesting, which mentioned the possible role of non-specific anti-viral approach towards Ebola virus infection. They noted the role of interferon and "applying a non-specific anti-viral approach during the incubation period of virus infection as an essential protection to put the host's immune system into an alert state and henceforth to slow down the viral replication." In previous report, Zhang and Wang (2014) mentioned the long history of Ebola virus infection discovery. However, the success in disease management is still not reached. Indeed, the role of interferon in treatment of Ebola has been widely discussed (Shuchman, 2014). The effectiveness of interferon has been proved in some animal models (Smith *et al*., 2013).

However, in addition to interferon mentioned by Zhang *et al*. (2015), there have been other non-specific anti-viral approaches for possible usefulness in the treatment of Ebola. The good examples include melatonin (Tan *et al*., 2014; Anderson *et al*., 2015) and antibodies, such as intravenous immunoglobulin (IVIG) (Rager-Zisman, 2014). Focusing on melatonin, Tan *et al*. (2014) first raised the possibility for its use as a new drug against Ebola. They noted that melatonin had activity targeting many pathological processes observed in Ebola virus infections (such as disseminated intravascular coagulation and multiple organ hemorrhage) and proposed that melatonin might have some advantages as a new treatment. Anderson *et al*. (2015) recently concluded that melatonin had roles in the reduction of pro-inflammatory cytokines and optimizing the appropriate immune response that could be useful for management of Ebola virus infection. Focusing on antibodies, immune sera are mentioned for effectiveness against the infection (Eickmann and Schumacher, 2014). However, the availability and safety of antibodies remain important points for further discussion (Rager-Zisman, 2014).

Nevertheless, there is still no clear evidence confirming the efficacy of interferon or other non-specific anti-viral approaches towards Ebola. Further clinical trials are needed. Finally, we would also like to note that there are also some new reports on the possible effectiveness of specific antiviral drug towards Ebola. The latest report on the effectiveness of favipiravir against Ebola in animal models is one such potential new antiviral drug (Nagata *et al*., 2014; Oestereich *et al*., 2014; Mentré *et al*., 2015). Currently it is used for management of the infection in some settings (Mentré *et al*., 2015). However, the great concern is the lack of supporting evidence from scientific clinical trials (Nagata *et al*., 2014).

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Compliance with ethics guidelines

Beuy JOOB and Viroj WIWANITKIT declare that they have no conflict of interest.

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