blood advances

TO THE EDITOR:

Promoting platelets is a therapeutic option to combat severe viral infection of the lung

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At the end of 2019, a novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; also known as 2019-nCoV), emerged in Wuhan, China. SARS-CoV-2 infection has caused severe pneumonia, namely COVID-19, through human-to-human transmission.[1] Because there have been rapidly increasing cases of COVID-19 across China and other countries, including South Korea, Iran, Japan, Italy, and the United States,[2] efficient therapeutic strategies against SARS-CoV-2 are urgently needed. Although a few drugs are currently undergoing clinical trials to treat COVID-19 (eg, remdesivir [GS-5734],[3] favipiravir [T-705][4]), general and supportive therapies remain the main strategies for treating COVID-19. These include oxygen supply, interferons, glucocorticoids, human serum albumin, and antibiotics as appropriate.[5] Thus, additional therapeutic options need to be explored.

Platelets are tiny, discoid, anucleated cell fragments, with a diameter of 1 to 3 μm and a life span of 8 to 12 days. Despite their size and relatively short life span, platelets are indispensable for many important biological processes such as hemostasis, thrombosis, wound healing, angiogenesis, immunity, and inflammatory responses.[6] Moreover, mounting evidence has indicated that platelets play a critical role in

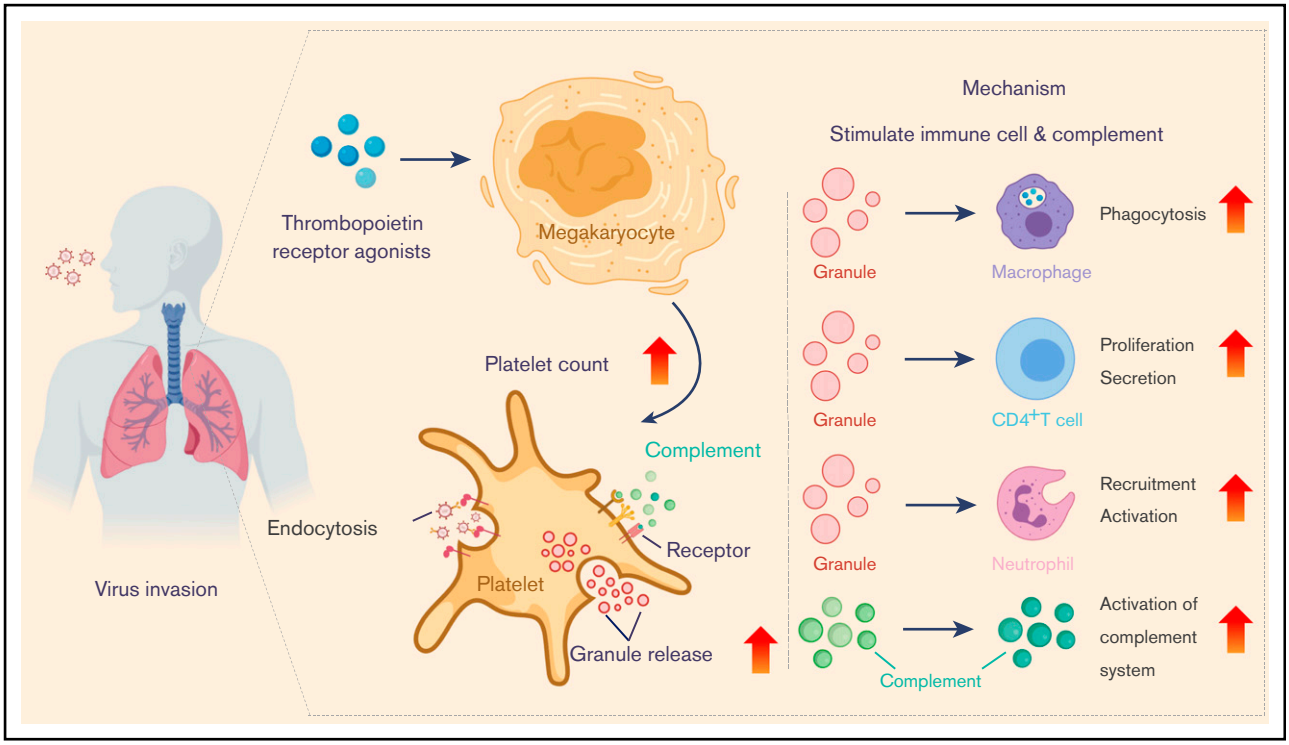

Figure 1. Antiviral activity and platelet-mediated mechanisms. TPO receptor agonists increase megakaryocyte viability and proliferation, leading to an increase in platelet counts. Platelets activated by virus endocytose virions and release granules, ultimately exerting their antiviral activity by stimulating immune cells and activating the complement system.

innate immunology in the lung, including in the defense against a variety of respiratory viruses. For example, recent findings have uncovered a role of platelets against pulmonary infection of influenza A (H1N1). Activated platelets engulf HIN1 virions and secrete antiviral molecules (eg, α-granules) to destroy virions.[7] Importantly, the lung was recently shown to be a primary site for platelet biogenesis, as a large population of megakaryocytes circulate through the lung and release platelets there.[8] The current review recapitulates relevant studies regarding the antiviral activities of platelets in the lung (Figure 1), aiming to exploit the platelet-dependent therapeutic options for the treatment of COVID-19.

Data-sharing requests should be submitted via e-mail to the corresponding authors, Shuping Zhang (spzhang@sdfmu.edu.cn) and Juan Ma (juanm@rcees.ac.cn).

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