SUMMARY OF THE INVENTION

The present invention is based, at least in part, on the discovery that caspase inhibitors can be used to enhance regeneration and repair after skin or gut injury, treat bacterial infections and skin lesions, and to treat viral infections.

In one aspect, provided herein is a use of emricasan for preparation of a medicament for the treatment of a bacterial infection.

In one aspect, provided herein is a use of emricasan for preparation of a medicament for the treatment of a skin and soft tissue bacterial infection.

In one aspect, provided herein is a use of a caspase inhibitor for preparation of a medicament for the treatment of a COVID-19 infection.

In one aspect, provided herein is a use of Q-VD-OPh for preparation of a medicament for the treatment of a bacterial infection.

In one aspect, provided herein is a use of Q-VD-OPh for preparation of a medicament for the treatment of a skin and soft tissue bacterial infection.

In one aspect, provided herein is a use of Q-VD-OPh for preparation of a medicament for the treatment of a COVID-19 infection.

In one aspect, the present invention can be used to treat bacterial infections and skin lesions. Indeed, the present invention provides caspase inhibitors as an alternative to antibiotics by engaging the host immune response to promote clearance of bacterial infections. In the U.S., there are over 14 million outpatient/ER visits and 750,000 hospital admissions per year. Also, there are 2 million people who suffer from invasive antibiotic-resistant infections with 23,000 deaths per year in the U.S. alone. The use of caspase inhibitors in the present invention is ground-breaking as it could combat the bacterial infection as an alternative to antibiotic therapy or used in conjunction with antibiotic therapy. This will improve patient outcomes and prevent the spread of antibiotic resistance. As described in Example 2 and the Figures, a caspase inhibitor was used to decrease bacterial burden and skin lesion sizes against a *Staphylococcus aureus* skin infection, a group A Streptococcus (*Streptococcus pyogenes*) skin infection and a *Pseudomonas aeruginosa* skin infection.

Based on the embodiments and experiments described herein, in another aspect, the present invention can be useful to treat viral infections. In a specific embodiment, the compositions and methods of the present invention can be used to treat COVID19. The clinical features of COVID19 include organ damage (LDH, LFTs, troponin), acute respiratory distress syndrome (ARDS) and sepsis. In severe cases, the immunologic features

include high C-Reactive Protein (CRP), high cytokines (IL-2R, IL-6, IL-10, TNF), low lymphocytes (CD4 and CD8) and low INF-γ (Chen et al. JCI 2020). The goal of therapy in severe cases includes decrease viral load, decrease bacterial load, decrease organ damage, enhance organ recovery and coagulation control. Immunological goals include increased antiviral/antimicrobial immunity, decrease apoptosis, increase tissue regeneration and modulate/decrease hyperactive immune response. The compositions and methods of the present invention that utilize caspase inhibitors can be used to treat viral infections including COVID19. Thus, in one embodiment, a method for treating COVID19 in a patient comprises the step of administering a caspase inhibitor. In a specific embodiment, the caspase inhibitor comprises Q-VD-OPh. In another embodiment, the method further comprises administering a TLR3 agonist.