Proteinase release from activated neutrophils in mechanically ventilated patients with non-COVID-19 and COVID-19 pneumonia

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To the Editor:

Severe cases of pneumonia are frequently associated with acute respiratory distress syndrome (ARDS), which carries a mortality rate of about 40% [1]. Uncontrolled host inflammatory response in the lung is a key factor in the transition from pneumonia to ARDS, with alveolocapillary membrane disruption leading to interstitial and alveolar oedema [2]. Neutrophils are part of the innate immune system and are the first responders to local tissue damage and infection. Recruited neutrophils are considered important actors in lung tissue injury [3]. Indeed, their broad arsenal of antimicrobial weaponry can cause direct and indirect collateral damage. Neutrophil serine proteinases (NSPs), including elastase (NE), proteinase 3 (PR3) and cathepsin G (CatG), are released from activated cells and play a part in ARDS pathophysiology, as illustrated in both preclinical and clinical studies [4]. Thus, NSPs emerge as an untapped point for therapeutic interventions in pneumonia-induced ARDS [4]. These NSPs are readily synthesised in neutrophil precursors within the bone marrow and are converted into their active form by cathepsin C (CatC) [5]. They are stored together in cytoplasmic granules and secreted into the extracellular compartment upon stimulation [6].