ABSTRACT

Neutrophils are polymorphonuclear and phagocytic leukocytes that act as the first line of innate immune defense to protect and rapidly kill the invading pathogens from the human body. In general, neutrophils are essential immune cells that play a significant role in the early response to infections through their ability to migrate into affected tissues upon pathogens invasion. The activation of neutrophils contribute significantly to enhancing the immune system's response by several mechanisms including phagocytosis, degranulation, respiratory burst, and formation of neutrophils extracellular traps (NETs) to against invading pathogens. DA-22 is a commercialized and confidential drug compound. DA-22 is the most common drug for AGC kinase inhibitors, which potentially inhibits Rho-kinase (ROCK) and anti-protein kinase B (AKT). To our knowledge, there is no previous study that investigates the effects of DA-22 on human neutrophil activation. This research was conducted to examine the ability of DA-22 to activate human neutrophil and their immune response. The investigation involved conducting experiments, including tests for elastase release and superoxide generation to assess degranulation and respiratory burst in neutrophils. Another experiment was also performed, including NETs and CD marker detection to assess NETs formation and the release of granules in neutrophils. The results showed that DA-22 significantly induced elastase release, degranulation, and NETs formation, but did not induce respiratory burst in human neutrophils. In conclusion, our findings declare that DA-22 is able to enhance the immune response of human neutrophils.

Keywords: Neutrophils, Phagocytosis, Degranulation, Respiratory Burst, Neutrophil Extracellular Traps, DA-22