

Innate immunity as an executor of phenoptosis – the programmed death of individual organisms for the sake of the whole population

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Abstract: In humans, over-activation of innate immunity in response to viral or bacterial infections often causes severe illness and death. Furthermore, similar mechanisms related to innate immunity can cause pathogenesis and death in sepsis, massive trauma (including surgery and burns), ischemia/reperfusion, and some toxic lesions. Based on these observations, we hypothesize that such severe outcomes may be manifestations of a controlled suicidal strategy protecting the entire population from the spread of pathogens and from dangerous pathologies rather than an aberrant hyperstimulation of defense responses. We argue that innate immunity may be involved in the implementation of phenoptosis, an altruistic programmed death of an organism aimed at increasing the well-being of the whole community. We discuss possible ways to suppress this atavistic program by interfering with innate immunity and suggest that combating phenoptosis program should be a major goal of future medicine.