
Immune tolerance as a developmental process – innate immune system and gut bacteria interactions

Tami Schneider*¹

¹Cohn institute for History and Philosophy of Science and Ideas, Tel Aviv University – Israel

Abstract

I discuss the implications of the symbiosis between the innate immune system and gut microorganisms to the concept of evolutionary individuality.[1] The immune system is one of the key players in gut symbiosis being the first to respond to commensal bacteria. In this encounter the immune system is able to tolerate the commensal bacteria introduced to the body at birth and continues to tolerate other kinds of microorganisms throughout life. Moreover, the commensal composition can change as a result of environmental or diet changes. I explore the concept of *immune tolerance* as an active process of the immune system that is active throughout the life of the host. The immune reaction to new species of microorganisms is a vital function for the host's survival due partly to its role in maintaining gut homeostasis. Tolerance is thus a dynamic and flexible process involving interactions with gut microorganisms. These interactions lead to immune development as well as affecting the development and variation in the microbial communities.[2] I suggest a framework which situates the innate immune tolerance in the gut as system that establish and monitor the symbiosis with microorganisms contracted from the environment. From this perspective the innate immune system's relationship with the biotic environment is collaborative not simply antagonistic. This notion conceptualizes the symbiosis of the innate immune system and gut bacteria as a dynamic developmental system which develops during the individual ontogeny.

Dupré, John., and Maureen A. O'Malley,. "Varieties of Living Things: Life At The Intersection Of Lineage And Metabolism". Philosophy and Theory in Biology 1.003(2009)1-25.

Pradeu, Thomas, "What is an organism? An immunological answer" History and Philosophy of the Life Science 32.2-3(2010):247-267.

Ji-Hwan Ryu, Eun-Mi Ha, Won-Jae Lee, "Innate immunity and gut-microbe mutualism in *Drosophila*". Developmental and Comparative Immunology 34. p. 369-376. 2010.

*Speaker