Humoral and Cellular Responses in Innate Immunity

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Innate immune responses are initiated when immune cells recognize invading pathogenic microbes using specific receptors. The binding of surface structures of microbes, which are often called molecular patterns, to receptors of immune cells causes a change in the repertoire of proteins so that they act against pathogens. The response taken by activated immune cells consists of humoral and cellular reactions. The former reaction includes production and secretion of soluble factors that kill the invaders and induce inflammation, and phagocytosis, by which microbes are directly removed, is at the center of the latter reaction. The mechanism of cellular response is lesser understood than that of humoral response. There is a battle between microbes and us for survival; the invaders exhibit various reactions to resist such host responses. The enemy is wise enough to avoid not only immune responses but also medical care such as chemotherapy. Antibiotic-resistant bacteria continue to spread, and we have no effective methods to prevent and cure diseases caused by viral infection. To gain a deeper understanding of innate immunity, both humoral and cellular responses, should lead to a new strategy to circumvent this situation. In this talk, I will review what has been known so far and discuss issues to be immediately solved.