

Social immunity: the immune system of the colony

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Social insect colonies are often called superorganisms. This illustrates that – just like the germline/soma separation in individual organisms – the queens specialize on reproduction, whilst the sterile workers take over somatic functions like nutrition, colony maintenance and disease defense. In both, organisms and superorganisms, the interests of all body cells or colony members are strictly aligned as selection acts at the reproductive entity rather than the individual level. Each colony member can thus increase its own (inclusive) fitness by maximizing the fitness of all, favoring the evolution of cooperative and even altruistic disease defense. We find that ants – just like immune cells – regulate their defense actions following a combination of pathogen-derived and host health cues. They care for contaminated, yet healthy, individuals, whilst eliminating fatally-infected workers. Moreover, they react to previous pathogen contact by modulating their sanitary behaviors in a risk-adjusted manner.