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Title: Autophagy in homeostasis, differentiation and aging of immune cells

Abstract: Autophagy is a conserved major cellular degradation process that delivers unwanted bulk cytoplasmic material to the lysosome. It takes place in every cell at all times at basic level, however, it can be induced to recycle material when nutrients are scarce. In addition unwanted organelles and macromolecules are turned over via autophagy once they have been labeled for degradation. Our in vivo work has demonstrated that under physiological conditions autophagy determines cell fate: it prevents cell death and cellular ageing, and maintains the life span of long-lived cells in particular.

Our recent results also show that autophagy is key to normal differentiation of hematopoietic cells. Cellular differentiation requires remodeling of the cytoplasm and change of metabolism. Autophagy's contribution to this process is the maintenance of mitochondrial quality and generation of ATP via fatty acid oxidation. We have also recently uncovered a novel pathway signaling for autophagy that relies on translation and is key to rejuvenation of the aging immune system. I will summarise our data on autophagy's impact on the immune system, with a particular emphasis on differentiation, maintenance and aging in mouse and human.

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