

# Reduced naïve T cell numbers correlate with increased low-grade systemic inflammation during ageing and can be modulated by physical activity

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## Abstract

Age-associated decline of immune system, termed immunosenescence, is characterized by low-grade systemic inflammation, known as inflammaging, together with T-cell functional dysregulation. Although affecting all individuals, different environmental as well genetic factors impinge on the individual's susceptibility or resilience to immunosenescence. Physical activity has been shown to improve autonomy and functionality in older adults. However, if physical activity affects immunosenescence or inflammaging remains unknown. The purpose of this study was to analyze immunosenescence and inflammaging in elderly individuals by measuring peripheral naïve T cells and interleukin (IL)-6 from peripheral blood and evaluate the impact of physical activity on T cell dysregulation and inflammaging. Thirty (30) elderly volunteers (10 males and 20 females), and 7 young controls (2 males and 7 females), were recruited for this study. A methodology questionnaire was used to evaluate different parameters such as physical activity, and peripheral naïve CD4<sup>+</sup> and CD8<sup>+</sup> T cells and serum IL-6 were measured by FACS and ELISA respectively. Our results shown that naïve T cells decline, and IL-6 levels increase as older people age. Interestingly, we observed strong negative correlation between naïve T cells numbers and IL-6 levels in older adults, suggesting a direct link between reduced naïve T cell pool and increased inflammaging. Continuous physical activity during youth did not affect immunosenescence and inflammaging in elderly, but physical activity during elderly increase naïve T cell numbers and reduce inflammaging in older subjects. Our results showed reduced number of naïve T cells and increased levels of IL-6 as elder people get older. Moreover, the strong negative correlation between these parameters suggest that naïve T cells can have a direct suppressive activity over innate immune components. Furthermore, physical activity during elderly can reduce immunosenescence and inflammaging in older subjects. © 2021, Universidad de la Frontera. All rights reserved.

**Author keywords**

Elderly; Immune system; Immunosenescence; Inflammaging; Naïve T cells; Physical activity