

In-depth analysis of blood cells reveals signs of aging

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"Doctors can't give you drugs just because you complain of being old," says Anis Larbi, who is trying to revolutionize the way elderly people are cared for. Larbi and his team at the A*STAR Singapore Immunology Network (SIgN) are looking at aging as a complex process, including the appearance of symptoms as with disease, the first of which is frailty.

Along with collaborators in Singapore, China and Canada, Larbi's team is the first to identify a link between inflammation, immunity and the signs of physical [frailty](#). "By determining the biological signature of frailty, we can start thinking of possible medical interventions."

Frailty is a condition associated with aging that limits a person's mobility and increases their risk of falling, hospitalization and death. "Frailty per se will not kill you," says Larbi. "But it will affect your quality of life." Unlike most diseases for which there are underlying causes, scientists have typically described frailty in purely symptomatic terms. Larbi and his co-workers wanted to understand whether an 'immunological frailty' is also present in the general state of malaise.

The researchers recruited around 100 Singaporean adults aged 55 or older from the Singapore Longitudinal Aging Study. They were assessed for their level of frailty based on two established models—the Fried frailty status, which looks at five physical symptoms from slowness to weight loss, and the Rockwood Frailty Index, which measures a broader range of dysfunctions. Blood samples were analyzed for markers of inflammation and signs of aging in immune cells.

Of the multiple biomarkers simultaneously tested using multiplex technology at the Immunomonitoring Platform at SIgN, eight were found to be either positively or negatively associated with frailty. Two of the biomarkers are linked to interleukin-6, an inflammatory cytokine which is associated with many age-related diseases.

At the cellular level, frailer people had higher levels of two types of white blood cells—poorly functioning, exhausted B cells, and inflammatory CD14+CD16+ monocytes. Cytotoxic T cells in these individuals "looked older", expressing lower levels of a protein called CD28, which is essential for their activation, proliferation, differentiation and overall survival.

More information: Yanxia Lu et al. Inflammatory and immune markers associated with physical frailty syndrome: findings from Singapore longitudinal aging studies, *Oncotarget* (2016). [DOI: 10.18632/oncotarget.8939](https://doi.org/10.18632/oncotarget.8939)

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