

The Aging Immune-System

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Certain diseases are more common and clinically more serious in elderly people than in the younger adults. This is because the immune system's efficiency is reduced with increasing age. Age-related changes in the immune cells responsible for eliminating virus-infected cells and cancer cells from the body - known as T lymphocytes or T cells - are most detrimental. The age-related decline in T lymphocyte function has been traced to fairly early degenerative changes that take place in the thymus, the organ in which T cells develop and mature. As these changes take place, the thymus gradually loses its ability to replenish and "update" the population of mature T lymphocytes in the blood.

Elderly people are, therefore, dependent on the T lymphocyte pool developed in youth and may be lacking the necessary cells to combat an infection or respond to vaccination. The T cell repertoire characteristically changes with aging. While the number of naïve T cells, which have never been confronted with their specific pathogen, decreases, the number of memory T cells increases steadily. While some T cell specificities, such as against persistent viruses, become frequent, others such as against influenza and tick born encephalitis (TBE) become rare in old age. This may result in a reduced protection provided by vaccination, e.g. against influenza or TBE, in old age.

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