PhD Thesis

Aging is associated with a decreased functional immune response known as immunosenescence (immune aging). Increased susceptibility to autoimmunity, infectious diseases, or cancer is found in elderly persons resulting in higher mortality. Although aged-related immunity is declined, high levels of protease activity are found in elderly, which results in chronic inflammation and can cause harm. In this circumstance the function of proteases are poorly investigated. Therefore, a precise understanding how proteases are involved in immunosenescence is needed to interfere with an impaired immune response and thereby avoid aged-related diseases.

Specific aims for a PhD thesis:

1. To determine the function and regulation of proteases in an aging immune system. Major histocompatibility complex (MHC) molecules are proteolytically regulated by the cathepsins, therefore, altered protease activity can influence the antigen presentation machinery and impair T cell activation.
2. To investigate function of human natural killer T cells (NKT cells) during immunosenescence.
3. Application of specific inhibitors or natural herbal extracts as immunomodulators can restore an imbalanced protease activity, which might prevent immunosenescence and thereby interfere with tumorigenesis and immune evasion.

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