Giant cell arteritis (GCA) and polymyalgia reumatica (PMR) are two closely related syndromes affecting elderly people. Dramatic changes with age are characteristic for immune system. Immunosenescence has been recognized as component autoimmunity. General experience says that with age the capacity to generate protective immune response declines whereas reactivity to autoantigens increases.

GCA and PMR is an inflammatory condition of unknown aetiology. The pathological finding in GCA is granulomatous infiltrates in the wall and medium sizes arteries (1). Immunohistochemical studies have shown that CD4+T lymphocytes and monocytes/macrophages are the dominant cell populations in the infiltrates. Weyand et al. (2) provided evidence recently for clonal expansion of CD4+ T cells in vascular lesions. A minority of tissue-infiltrating T cells was present in multiple copies, and CD4+ T cells with identical T cell receptor β chains were isolated from distinct vascu- litar foci. Clonal expansion of CD4+ T cells and restriction in the polymorphism of antigen-driven HLA-DR molecules support the model that GCA is an antigen- driven disease in the wall of medium sizes arteries. Wagner et al. (3) have searched for CD4+ interferon γ (IFN-γ)+ T cells in temporal artery specimens. Interestingly, only 2 to 4% of all T cells in the arterial wall have the capability of releasing IFN-γ. Although this observation raises the point that only small subsets of T cells may be disease relevant, these frequencies are compatible with the local activation of antigen-specific T cells. Indeed, CD4+ IFN-γ+ T cells in GCA lesions display several features that identify them as the T cells recently stimulated by specific antigen. Clonal expansion T cells were not detected in peripheral blood, indicating that there is accumulation of such T cells in tissue.

Besides T lymphocytes, macrophages are the second components of the vascular lesions. Their role in the inflammatory events in the arterial wall is unclear. Several functions of macrophages could be of significance in initiating and maintaining the tissue infiltrate in GCA. Data of Wagner et al. (4) support the view that an additional
component of systemic monocytes activation exists. It is possible that the activation of circulating monocytes results from an immune response to the same antigen in other tissues than the temporal artery, e.g. lymph nodes and bone marrow. Function activities of T cells and macrophages that accumulate in the arterial wall have been determined by analysing the transcription of cytokines and monokines in extract from temporal artery biopsies. Compared with noninflamed temporal arteries, inflamed specimens contain the T cell products IFN-γ and interleukin –2 (IL-2) and the CD68+ macrophage products IL-1 beta, IL-6 and transforming growth factor β (TGF-β). TGF-β was most abundantly found and was produced in conjunction with, but also in the absence of IL-1β and IL-6. Comparison of circulating and tissue-infiltrating CD68+ cells in GCA patients revealed two interesting finding. Circulating CD68+ cells were activated in high frequency and the composition of the peripheral and tissue compartments was clearly distinct, raising the possibility of selective recruitment into the vascular lesions. The presence of similar frequencies of CD68+ IL-6+ cells in PMR and GCA patients demonstrates that the activation of peripheral monocytes does not require the vasculitic component of the disease. Whether the availability of IL-6 and IL-1β producing monocytes in blood is prerequisite preceding the formation of the vasculitic lesions is possible but unanswered (4). In patients with PMR, cytokine mRNA can be detected in temporal artery tissue specimens despite the lack of microscopic evidence of tissue infiltrating cells (2). The low number of tissue infiltrating macrophage and sensitivity of the polymerase chain reaction may explain the finding of the low frequency of IL-6 in tissue of PMR patients. In contrast to macrophage activation, the T cell response appears to be quantitatively, but also qualitatively, different on the two diseases. Although patients with GCA and those PMR did not differ in their in situ production of IL-2, the presence of INF-γ sequences was significantly different. IFN-γ mRNA is more easily detected in active T cells than is IL-2 mRNA, indicating that the also absence of INF-γ in the tissue of PMR patients is of biological significance and is not a result of insufficient sensitivity. IFN-γ is crucial for macrophage activation and for granuloma formation. Thus the production of IFN-γ may be essential for the development of vasculitis. Patients with PMR may lack an important amplification mechanism in their local immune response in the vasculitic lesion (2). Tissue synthesis of tumour necrosis α and granulocyte-macrophage colony-stimulating factor has not been informative in distinguishing normal and inflamed temporal arteries. Clinical experience has shown that it is often difficult to document the presence or absence of vasculitis in patients with PMR. Weyand et al. (2) had shown that PMR and GCA share multiple pathogenic features in addition to similarities in the clinical presentation. Both disease have in common an association with selected HLA-DRB1 alleles in particular the HLA-DRB1*04 alleles (5, 6). Patients with PMR and GCA have highly elevated levels of serum IL-6. After initiating corticosteroid therapy IL-6 concentration abruptly return to normal and remain suppressed as long steroid therapy is continued.

B cells are extremely rare in the vascular lesions, which is consistent with the lack of antibody production and of immune complex deposition or hypergammaglobulinemia in GCA. Even patients with GCA and concomitant chronic lymphatic leukaemia, in which B cells are typically found to infiltrate diffusely into tissue, the temporal arterial