Reticulo-Endothelial System Encyclopedia Article

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The reticulo-endothelial system (RES) is a diffuse system consisting of phagocytic cells. These are derived from bone marrow **stem cells**, which are associated with the connective **tissue** framework of the **liver**, spleen, and lymph nodes. It consists of the combination of mobile macrophages and fixed tissue macrophages. The macrophages in various tissues differ in appearance because of their environmental differences and they are known by various names: Kupfer cells in the liver, reticular cells in the lymph nodes, spleen and bone marrow, alveolar macrophages in the **alveoli** of the **lungs**, tissue histiocytes, clasmatocytes or fixed macrophages in the subcutaneous tissue, and microglia in the **brain**. The term "reticulo-endothelial system" was coined because it was formerly believed that a major part of the **blood** vessel endothelial cells could perform phagocytic functions similar to those performed by the macrophage system. More recent studies have disproved this, however, but the term is nevertheless widely used. It should be remembered that the reticulo-endothelial system is almost synonymous with the tissue macrophage system.

The phagocytic cells within this system comprise the mononuclear phagocyte system (MPS), and the macrophage is the major differentiated cell in the MPS. The MPS also consists of bone marrow monoblasts and pro-monocytes, peripheral blood monocytes and tissue macrophages. Cells of the RES and MPS, particularly the liver macrophage or Kupfer cells, are known to be important in the clearance of particles from the bloodstream. Negatively charged particles, in particular, are avidly scavenged by macrophages. The Kupfer cell is one of the most important cells in the MPS. These are highly phagocytic cells located in the sinusoid wall, usually on the endothelial surface, of the liver. They have a number of functions, but one of the most important is their ability to endocytose and remove from the blood potentially harmful materials and particulate matter such as bacterial endotoxins, micro-organisms, immune-complexes and tumour cells. The recognition of these materials is mediate by an array of cell surface receptors that include receptors for IgG, IgA, complement components, galactose, mannose, CD4 and the carcino-embryonic antigen. Other receptors include the scavenger receptor, transferrin and DNA-binding receptors.