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MCP-1 and its role in macrophage recruitment in Lyme carditis

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Lyme disease is caused by infection with the bacteria Borrelia burgdorferi, causing arthritis and carditis in infected animals. The presence of spirochetes in the heart tissue induces recruitment of leukocytes to the area of infection and leads to the production of proinflammatory cytokines which are thought to play a role in the development of pathology. MCP-1 (macrophage chemoattractant protein-1) is responsible for the recruitment of macrophages, the main leukocyte found in carditis, to the infected tissue and has been related to increased severity of Lyme carditis. Based on these observations, the importance and role of MCP-1 in the development of Lyme carditis was investigated. It was hypothesized that carditis severity and pro-inflammatory cytokine production would be decreased in MCP-1 knock out (KO) mice, while the number of the number of B. burgdorferi organisms found in the heart of MCP-1 KO mice would be increased due the lack of recruited macrophages. MCP-1 KO and wild type mice were infected with B. burgdorferi in the hind paws and at 21 days post infection, the peak of Lyme disease pathogenesis, the heart of each mouse was harvested. After staining, heart sections were scored for the development of carditis. The severity of inflammation was scored on a scale from 0 to 3 according to the number of infiltration foci. There appeared to be no difference in the development of carditis between the wild type and the MCP-1 KO mice. Similarly, there was no difference between the number of B. burgdorferi organisms found in the hearts of MCP-1 KO and wild type mice. Studies are underway to determine the cellular makeup of immune cells in the heart tissue.