Macrophages and Aging

Project Description

Project duration:	1 year (Honours Project)
Description:	Tissues contain abundant resident macrophages that contribute to tissue development, homeostasis, regeneration, and pathology. Haematopoietic tissues, such as bone marrow and spleen, contain more than one tissue-resident macrophage population, each with distinct functional contributions to specific biological events. Specialized macrophages are essential for both red blood cell formation (erythroblastic island macrophages in the bone marrow) and red blood cell recycling (red pulp macrophages in the spleen), roles which require these cells to participate in iron homeostasis. The main protein involved in storing iron cations with cells is ferritin, which is also the precursor to hemosiderin. Hemosiderin can be observed under both physiological and pathological conditions and consists of a heterogeneous aggregate of iron, lysosomal components, and other products of intracellular digestion, within which iron has poor bioavailability. We have recently observed that aging is associated with increased iron accumulation within bone marrow macrophages and other alterations in macrophage phenotype. This project will further examine the aged macrophage phenotype and determine whether treatment with a macrophage growth factor (CSF1-Fc) influences this phenotype in young, adult and aged mice.
Expected outcomes and deliverables:	Knowledge gain: Increased understanding of age-related changes in macrophages and the potential contribution of these changes to aging. Skills gain: Histology, immunohistochemistry, immunofluorescence, microscopy, image analysis (including AI tools), analysis of flow cytometry data.
Suitable for:	Interested students need to be diligent, meticulous, inquisitive, and self-motivated. Flexibility in working hours will be required. Knowledge of immunology and immuno-staining theory and/or hands on experience, are desirable. Project will be based at the Translational Research Institute in Woolloongabba.
Primary Supervisor:	Dr Susan Millard and Professor Allison Pettit
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