Title: An anatomical role for adipocytes in normal and pathological bone formation

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Bone is a remarkable tissue that has many roles and functions, in recent years, the adipocytes that sit within bone have become an area of great interest. In recent years interest in adipocytes has grown hugely, moving away from the belief that adipose tissue is an energy store, to showing that adipocytes have a key role in endocrine and metabolic function and dysfunction. However, anatomically, little is known about adipocytes and the role they play in the maintenance or contribution of the structure of the tissue and those which surround them. The aim of this project is to examine the anatomical role that adipocytes play within the bone matrix. Our previous collaborative research has shown that the adipocytes within bone have more than a physiological effect in the tissue (1).

This project will examine the exact anatomical role, location and types of adipocytes within the bone marrow cavity. Human bone from trauma and diseased state will be obtained with informed patient consent and ethical approval to enable us to examine marrow adipocytes. This will be done using a combination of histological, immunohistochemical and biochemical techniques look to categorise their type and quantity relative to age and disease status of an individual. The potential for further roles of adipocytes within the body will be provided on completion of this research.

1) Taylor AM, Boyde A, Davidson JS, Jarvis JC, Ranganath LR, Gallagher JA. Identification of trabecular excrescences, novel microanatomical structures, present in bone in osteoarthropathies. Eur Cell Mater. 2012 Apr 21;23:300-9.