

A year in review 2016/17

2016/17 saw the final year of funding for Leeds Musculoskeletal Biomedical Research Unit (LMBRU) and success in obtaining a further five year funding as **NIHR Leeds Biomedical Research Centre (BRC)**.

LMBRU maintained its high level of activity in 2016/17, and the BRC will continue to progress research in:

- Preventing disease and disability in immune mediated inflammatory diseases (inflammatory arthritis and connective tissue diseases)
- Improving the treatment of osteoarthritis, enabling “50 active years after 50”

LMBRU 2016/17 Performance



134

- Research studies supported by LMBRU



2825

- Participants recruited into LMBRU studies



165

- Research publications from LMBRU researchers



89

- Research trainees affiliated with LMBRU



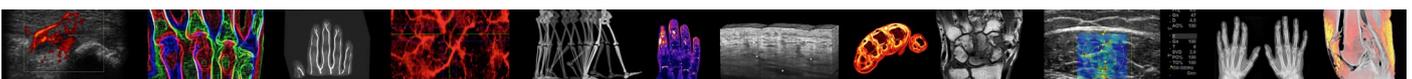
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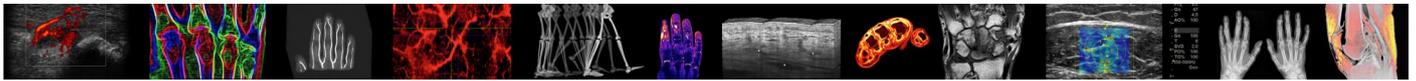
- Million in additional research income



5

- Invention disclosures (3) & new patents filed (2)





LMBRU Key Achievements During 2012/17

The top five research impacts from the LMBRU over the last five years are summarised below:

Rheumatology Clinical Research

Our work on identification and staging of patients at risk of developing inflammatory arthritis has characterised features of the pre-clinical stage of inflammatory arthritis including autoantibody status, imaging and immunological biomarkers. This has enabled the development of risk models for developing inflammatory arthritis for primary and second care. The evidence now strongly suggests that patients managed in this way will do much better in the long term, as they are treated the moment they have clinical arthritis.

Experimental Rheumatology and Inflammatory Mechanisms

We have made progress in the characterisation of B lineage cells in rheumatoid arthritis (RA), including evidence suggesting that long lived plasma cells arise shortly after autoimmune disease commencement, which has implications for resistance to B cell depletion therapy which does not affect the long lived plasma cell population. We have also shown differences in B cell, T cell and monocyte expression between responders and non responders to first line methotrexate or etanercept in newly diagnosed RA.

Bioengineering and Technological Interventions

We have developed enhanced simulation systems and test methods for preclinical testing of hip and knee prostheses with industry partners. These take into account variation in surgical positioning and the range of activities undertaken by different patients in order to better predict patient outcomes. Outputs include commercial development of a new generation of hip and knee joint simulation equipment and new simulation methods, and submission of a new international standard for preclinical testing of hip prostheses

Biomaterials and Regenerative Interventions

We have developed, patented and licensed a novel medical device (stem cell release brush) for the liberation of mesenchymal stem cells (MSCs) during knee arthroscopy for the treatment of small cartilage defects. Proof of concept studies have shown that the device increases the number of MSCs at the point of surgery and that these are viable and functional in laboratory tests. We are now conducting a safety and efficacy clinical trial to evaluate its effect on the regenerative capacity of the knee joint after microfracture.

Imaging and Tissue Characterisation

Our major impact in this area has been the validation of quantitative 3D (structured machine learning) MRI tissue measures for rheumatoid arthritis (RA) and osteoarthritis (OA) in collaboration with an SME partner, enabling us to establish the most responsive measures of progression (quantitative multi tissue assessments for RA and subchondral bone for OA). Using these as outcome measures reduces the number of participants required for clinical trials, and both are now being used in pharmaceutical company studies.

For more information visit our website: <http://lmb.ru.leeds.ac.uk/>