**Introduc**

The ECELLFRANCE Montpellier platform is dedicated to the evaluation of the immunomodulatory and regenerative properties of mesenchymal stem cells in osteoarticular and autoimmune diseases.

The expertise relies on the use of relevant pre-clinical murine models of these diseases and the follow-up of clinical, biological, immunological and structural parameters.

**Osteoarththritis murine models**

- Cartilage degradation is evaluated after safranin 0 staining on histological slides.
- Complementary analyses: CLSM and dosage of biomarkers in serum (OPG, CTX-II, IL-6,...) can be performed.

**Collagen-Induced Arthritis model**

- The pre-clinical model of Collagen-Induced Arthritis (CIA) is one of the most relevant model of Rheumatoid Arthritis.
- Clinical score is monitored every two days after boost.
- Inflammation is evaluated by quantification of immune cell subsets (Th1, Th17, Treg cells) in spleen and draining lymph nodes, cytokine secretion. Cartilage and bone degradation is evaluated by histological and μCT analyses.

**Biodistribution studies**

- Stem cells are injected in immunocompetent or immunodeficient mice.
- Human cells are detected via quantification of the number of Alu sequences by qPCR or in situ hybridization (FISH) on fixed organs.

**Toxicology studies**

- Mice are monitored twice a week (weight, general behaviour).
- Organs are processed for routine histology (paraffin inclusion, sections and hematoxylin eosin staining) and analysed by an anatomopathologist.

**Cartilage imaging by confocal Laser Scanning Microscopy**

- Degradation of articular cartilage can be evaluated by CLSM after 3D reconstruction of the tissue and the quantification of morphometric parameters: cartilage volume, thickness and surface.

**Cartilage and bone imaging by µCT**

- Bone tissue can be analysed by in vivo longitudinal studies. Multiple organs (cartilage, lung, heart, kidney,...) can be analyzed at euthanasia after fixation and process using a contrast agent.
- After 3D reconstruction, tissue integrity is evaluated by quantification of several parameters (as example for bone: volume, surface, density, trabeculae number,...).