

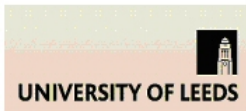
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PurStem, “Utilisation of the mesenchymal stem cell receptome for rational development of uniform, serum-free culture conditions and tools for cell characterization” is funded under FP7 Cooperation Work Programme: Health.

PurStem is coordinated by Prof. Frank Barry of the Regenerative Medicine Institute (REMEDI) National University of Ireland, Galway. The project is 36 months in duration, from November 2008 to October 2011.



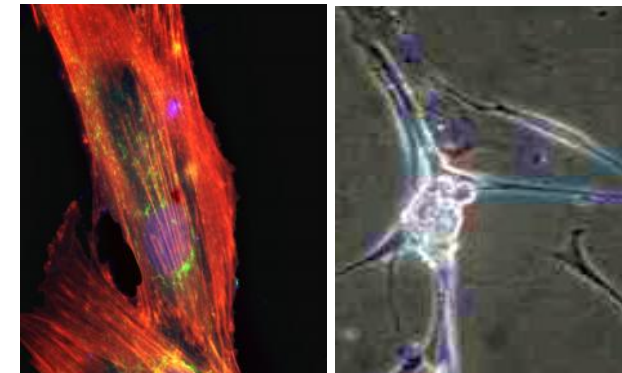
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PurStem

Revolutionising the large-scale production of high quality adult stem cells.

Stem cells have shown tremendous potential for the repair and regeneration of a large range of tissues and organs. The translation of this potential into routine clinical therapies requires large numbers of stem cells. PurStem is a project funded under the Framework 7 Programme of the EU, aiming to facilitate the production of industrial quantities of high-quality adult stem cells suitable for clinical applications.



The Potential and the Problem

Adult stem cells have great potential as treatments for a variety of human diseases. Exciting studies are currently being conducted to assess the usefulness of stem cells in the treatment of osteoarthritis, bone defects, diabetes, cancer and other diseases.

At present, there are few standard tests for the identification of adult stem cells and there is little consensus regarding the methods for their isolation and culture. Even the methods for storage and transport of stem cells vary between laboratories.

Progress in the large-scale preparation, consistent supply and clinical application of adult stem cells will be hindered until internationally-harmonised standards for the isolation, characterisation and culturing of adult stem cells are put in place. Such standards will facilitate the effective replication of research across different laboratories.

In addition, the culturing of stem cells in growth media which contains animal products (bovine or human serum) introduces new barriers in the form of batch variation and transmission of pathogens which are difficult to overcome. Serum-free media are required in order to remove these barriers.

The Solution

PurStem brings together four leading adult stem cell research laboratories, with a special focus on mesenchymal stem cells, plus three specialist SMEs.

All four laboratories are working together to devise precise standard operating protocols for the following key stages of stem cell preparation for therapeutic use:

- Isolation of adult stem cells from bone marrow
- Expansion of stem cells in growth medium
- Differentiation of stem cells into cells with tissue-specific phenotypes
- Storage and transport

Each of these stages requires the evaluation, optimisation and standardisation of protocols. By creating and promoting these standard protocols, PurStem will support scientists to carry out research which can be more easily and reliably reproduced across several laboratories.

PurStem will also apply specific expertise to the development of serum-free media for stem cell culture.



The Results

PurStem will deliver three main outputs, each making a distinct contribution

- A standard operating procedure for culturing adult human mesenchymal stem cells (MSCs). This will lead to optimised and standardized methods for MSC culture, as well as enhancing productivity.
- A serum-free medium with the optimal mix of growth factors to encourage the differentiation of MSCs into bone and connective tissue. This will remove the barriers associated with products of animal origin.
- GMP-grade release assays, based on novel antibodies to stem cell surface receptors. This will provide new tools for identifying and characterizing MSCs.

