BIOTECHNOLOGIES

MULTIPLE MYELOMA MODEL FROM PATIENT-DERIVED BONE MARROW ORGANOIDS

Partnership and/or Licensing Opportunities

Donnons au sang le pouvoir de soigner

Multiple myeloma (MM) is a blood cancer mediated by the plasma cells in the bone marrow. MM is an incurable disease, but treatments can prolong patients' lives. Animal models are not always representative of the disease in humans and can be time-consuming and expensive. 3D models have emerged as a promising alternative to animal models and can be generated from human cells and can better reflect the tumour environment than animal models. In addition, 3D models can be used to test new drugs and therapies more quickly and at lower cost than animal studies.

INVENTION

The invention relates to a method for producing a three-dimensional (3D) human multiple myeloma (MM) model, in the form of spheroids, by co-culturing mesenchymal stem/stromal cells, endothelial progenitors and primary plasma cells (MM cells) from MM patients. The invention also relates to the spheroids obtained by said method and their uses.

KEYWORDS

Multiple myeloma, PDO, 3D culture, Spheroids, Co-culture, Mesenchymal stem/stromal cells, Endothelial progenitors, MM cells

DESCRIPTION

The invention is a method for producing 3D spheroids that mimic the tumor microenvironment of multiple myeloma (MM). These spheroids are made up of three types of cells: mesenchymal stem/stromal cells (MSCs), endothelial cells (ECs), and primary CD138+ plasma cells from MM patient. The spheroids can be either autologous, meaning that all of the cells come from the same patient, or heterologous, meaning that the cells come from different patients.
The method for producing the spheroids is as follows:

- Culture MSCs, ECs, and endothelial progenitors.
- Harvest the MSCs, ECs, and endothelial progenitors.
- Co-culture the MSCs, ECs, and endothelial progenitors with sorted primary CD138+ plasma cells.

The spheroids that are produced by this method can be used to study the response of MM cells to different treatments.

APPLICATIONS

- Selection of a therapeutic treatment for MM patients
- Study of tumor tissue (including microenvironment) responses to different treatments
- Development of new therapies for MM

ADVANTAGES

- More representative of patient's tumors than animal models
- Can be generated in 2 weeks
- Treatment selection can be done in 1 week
- Personalized treatment for MM patients (predictive model)

CONTACTS

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INTELLECTUAL PROPERTY

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