

Medicina

PARTNER SEARCH HEALTH-PT-LCP-3

01 dicembre 2017

Oggetto: PARTNER SEARCH HEALTH-PT-LCP-3

Richiesta di un'istituto bielorusso alla ricerca di partner italiani da includere in un loro progetto nella tematica "Health" nei topic:
Health-2007-1.4.-6: Stem cells lines for cell-based therapies.

Di seguito, una breve descrizione del progetto e le caratteristiche del partner richiesto.

Per informazioni sul progetto contattare tegas@apre.it facendo riferimento al codice PARTNER SEARCH HEALTH-PT-LCP-3

----- PARTNER SEARCH HEALTH-PT-LCP-3 -----

<Reference n.: HEALTH-PT-LCP-3>

<Deadline: 18/09/2007>

<Programme: COOPERATION>

<Project Title: The study of extrinsic embryonic and mesenchymal stem cells transplantation into Rheumatoid arthritis joints of experimental animals under model conditions to elaborate the new approaches for the treatment of model disease>

<Financial Scheme: >

<Description: Priorities' Main Research Areas:

(Topics from Workprogramme) Regenerative medicine. Health-2007-1.4.-6: Stem cells lines for cell-based therapies on knowledge and technologies in the field of Life sciences, genomics and biotechnology of health, focussing on the recent advances in mesenchymal stem cell (MSC) research, gene transfer and tissue engineering for the treatment of connective tissue diseases.

Idea of the project

Background:

Propose is to develop new knowledge, new technology, new products (stem cells) through research activities. Study will be conducted using embryonic stem cells (ESCs) and mesenchymal stem cells (MSCs) obtained or produced in the IBCENASB for Rheumatoid arthritis (RA).

RA is a chronic system inflammatory disease of connective tissues with predominant destructive-erosive affection. At present, many facts indicate that RA is a disease with disordered motor functions resulting very often in death. Statistics data show that mortality

rates are increased with simultaneous decreasing in average life interval of RA patients by 10-15 years. It clearly means that this disease is dangerous for life.

RA is associated with changes in humoral (rheumatoid factor) and cellular immunities. This is accompanied by active synoviocyte proliferation comparable with that of malignant cells. The assessment of functional state of locomotor apparatus is an important diagnostic criterion of RA severity.

The intra-articular inflammation in RA is induced and supported by a number of cytokines such as IL-1, TNF, IL-6, TGF- β ; etc. These factors are known to be crucial for the regulation of proliferation activity of stem cells. Besides, they provide cell viability and keep

the cell in "stemness" state. They themselves exert a pathologic action on the cell component of joints when joint inflammation is induced.

In the frame of the Health-2007-1.4.-6 the following experiment will be done:

1. study of the influence of the growth factors such as LIF, SCF, or L-6 and their combinations with the TGF- β ; on growth, proliferation, colony formation, vital capacity of MSCs obtained or produced in the IBCENASB;
2. creation the RA model in mice and rats;
3. evaluate the state of locomotor apparatus and the expression level of inflammatory process in model animals;
4. characterize the structural and metabolic states of the cells of the immune system;
5. analysis of the regulatory action of cytokines on the maintenance of pluripotency of MSCs ex vivo;
6. study of the influence of MSC transplantation on the development of RA;
7. analysis of the efficacy of cellular therapy using .

This work is in HEALTH framework in order to elaborate the approaches for the treatment of RA under the model conditions using MSCs that can be useful for therapeutic intervention in human.

The IBCENASB role consists in obtaining the new data on the influence of various inductors such as LIF, SCF, and IL-6 in combination with TGF- β ; on growth, proliferation, formation of colony, and also intrinsic growth factors (LIF) using RT-PCR, and vital capacity of MSCs.

The objectives of IBCENASB proposal - to elaborate the methods of MSC utilization for arthritis treatment. The importance of IBCENASB contribution is to establish of relationship between local joint inflammation and system inflammatory process in organism and also with the structure-function changes in the cells of immune system.

The proposed investigations will be performed using RA model that provides for the complementarity between original participants and IBCENASB.

Development of experimental RA model.

RA can be induced by the injection of Freund's complete adjuvant (FCA) containing heat-inactivated Mycobacterium tuberculosis. Two groups of experimental animals will be investigated.

Evaluation of inflammatory process expression during the experimental RA will be done using different determinations as follows:

1. serum acid glycoproteins;
2. serum TNF;
3. C-reactive protein (CPR);
4. content of tyrosine-containing and hydrophobic peptides in serum and synovia;
5. biophysical parameters of synovia;
6. ROS under lipid peroxidation and activity of phospholipases in synovia.

Evaluation of functional state of locomotor apparatus in experimental animals.

This study includes elucidation of presence of osteoporosis, constriction of joint slit, degree of joint erosion. Progression of adjuvant arthritis will be clinically evaluated for their

characteristic signs and symptoms by employing an arthritis score. Besides, the pigmentation of skin in joint region will be tested by luminescence method and evaluation of joint morphology will be done using light microscopy. For that, tissue sections on the glass slides stained with hematoxylin and eosin will be prepared.

Characterization of metabolic state of immune system.

Adjuvant arthritis is a typical autoimmune disease accompanied by the disturbance of T-cell immunity. Therefore, the analysis of their immune status including energy cell status, structure-function state of membranes, parameters of antioxidant system gives a valuable information on the expression of inflammatory process.

Analysis of regulatory influence of cytokines on MSC development ex vivo.

The experiments will pursue the following objectives:

1. To select the conditions for the cultivation of GENOSTEM MSCs in presence of regulatory growth factors such as LIF, SCF or IL-3, TGF- β ; the determination of optimal cell/factor ratio in cultural medium. Collection of MSC biomass for analysis of proliferation potential of the cells, determination of their spectroscopic and microscopic parameters.

The determine the dose and time course dependencies of apoptosis manifestation of MSCs in presence of growth factors (LIF, SCF, IL-6).

The study of influence of MSC transplantation into RA damaged knee-joints of experimental animals under model conditions. The efficiency of MSC therapy.

The experiments will include: the determination of expression of inflammatory process (Task 2); the evaluation of the state of the locomotor apparatus; the characterization of the metabolic state of the cells of immune system.

Keywords:

Rheumatoid arthritis, chronic system inflammatory diseases, cytokines, growth factors, in mesenchymal stem cells, tissue engineering.>

<Organisation Type: Centro di Ricerca>

<Partner Sought: Commitment/Work to be offered:

The given project will be performed in our Laboratories by the research team consisting of biochemists, biophysicists, morphologists, cytologists under supervision of the director of our Institute. We are a leading research organisation in Belarus in the field of biophysics, proteomics, and genomics of cells including stem cells. This Institute is known by virtue of its researches on structure and dynamics of cellular membranes under the action of regulatory molecules (hormones, lectines, secondary messengers etc.). It has also experience in cell researches under pathological processes in organism (rheumatoid arthritis, disseminated sclerosis, lupus erythromatosis, cancer, etc.).

Profile of Partner Sought

Role:

- technology development
- research
- training
- dissemination
- demonstration

Country /region

- All country

Start of partnership

- start-up phase

Expertise required:

Molecular genetic field specially for congenital heart disease

Epidemiologist interested in the field of pediatric cardiology