JAGIELLONIAN UNIVERSITY
IN KRAKÓW

COBALT PORPHYRINS AS A NEW AGENT FOR MOBILIZATION OF CELLS FROM BONE MARROW TO PERIPHERAL BLOOD

(PROJECT no. P-234)

Potential drug: The cobalt porphyrins

Application: For the preparation of a new agent for cell mobilization from bone marrow to peripheral blood

The stem cells and progenitor hematopoietic cells (HSPCs) repeatedly divide in bone marrow and pass through successive stages of differentiation. Then mature and functional cells are released from the bone marrow into the bloodstream. It is now known that this process could be adjusted by pharmacological manipulations. Administration of granulocyte colony-stimulating factor (G-CSF) results in an enhanced production of granulocyte progenitor cells in bone marrow, and increases their release into the bloodstream. This process is called mobilization and has important clinical applications.

A steep decline in cell numbers in the blood are often observed in patients receiving chemotherapy as anti-tumor therapy. It increases the risk of infections which may have serious consequences and is necessary to interrupt the anticancer treatment. In this case, **administration of G-CSF increases mobilization of cells from bone marrow to the circulation system and restores to normal levels of blood cells.**

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Another important use of mobilization by G-CSF is preparation of a donor during the bone marrow transplantation. Currently peripheral blood cells are transplanted during the bone marrow reconstruction and the number of transplanted stem cells is crucial for the success of transplantation. In clinical applications for mobilization of cells into the bloodstream analogs of G-CSF (recombinant protein) are used. However, their production process is complicated and expensive.

The present invention relates to use of cobalt porphyrins, particularly protoporphyrin IX, for the **preparation of an agent for mobilization of cells from bone marrow to peripheral blood**. Administration of presented agent raises the level of G-CSF in the blood, causing the release of leukocytes, particularly immature granulocytes, into the peripheral blood.

The proposed agent and its derivatives may be potentially useful in the treatment of:

- congenital neutropenia (cyclic, autoimmune and idiopathic),
- neutropenia induced by chemotherapy, radiotherapy and pharmacological neutropenia,
- myeloid leukemia and acute lymphocytic leukemia,
- myelodysplastic syndromem.

The proposed agent may also find application in both allogeneic and autologous bone marrow transplantations. It increases the amount of hematopoietic stem cells circulating in the peripheral blood and facilitates their isolation in the apheresis process. At the same time it is easier and less expensive to produce compared to currently used solutions.

The offered invention is subject of a patent application. Further research and development are conducted at the Faculty of Biochemistry, Biophysics and Biotechnology of the Jagiellonian University. Currently the **Centre for Technology Transfer CITTRU** is looking for partners interested in development of the invention and its commercial application.

For detailed information please contact with:

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