

USE OF SSRI ALONE OR IN COMBINATION WITH GROWTH FACTORS FOR TREATING CYTOPENIA

Effect of selective serotonin reuptake inhibitors (SSRI) alone or in combination with G-CSF as a valuable treatment in therapy-induced aplasia in patients.

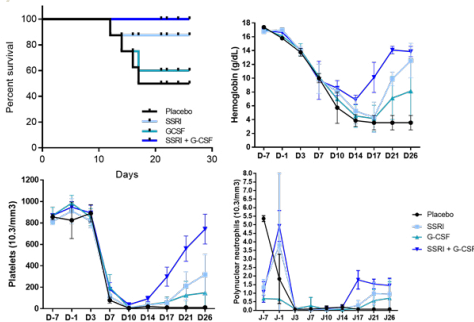
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PRESENTATION

Following acute stresses like chemotherapy or radiation, the hematopoietic system quickly adapts by a process termed “emergency” or “stress” hematopoiesis. In erythroid progenitors, the researchers recently identified a functional cell-autonomous serotonergic network with pro-survival and proliferative functions (Cell Reports 2019). Pharmacologic restoration of serotonin levels using selective serotonin reuptake inhibitors (SSRIs) such as fluoxetine, a common antidepressant, can rescue the anemic phenotype in mice models. In this project, the team has shown that the serotonergic system could be a valuable therapeutic target in radiation or chemotherapy-induced cytopenia, alone and in cooperation with known hematopoietic growth factors, such as G-CSF. Particularly, fluoxetine alone or in combination with G-CSF showed an additive effect on the recovery of the three myeloid lineages and on overall survival of mice following sub-lethal irradiation. This new combination of drugs offers interesting avenues to fasten hematopoietic recovery of cytopenia thereby decreasing the risk of complications for patients during aplasia.

Cytopenia - Serotonergic system - Hematopoiesis - Aplasia
Serotonin reuptake inhibitors (SSRI) - Bone marrow failure



COMPETITIVE ADVANTAGES

- Unique simultaneous action of SSRIs on the three myeloid lineages, showing faster recovery after cytopenia, saving at least 2 days of hospitalization
- Additional synergistic effect of SSRI with G-CSF
- Lower cost of SSRIs compared to the current treatment (mainly G-CSF alone)

DEVELOPMENT PHASE

- ☑ In vivo proof-of-concept in mice showing the effect of SSRI alone or in combination with G-CSF on the hematopoietic recovery of cytopenia (on the 3 myeloid lineages)
- ☑ Clinical data showing the role of SSRI on the hematopoietic recovery of cytopenia on a retrospective cohort of adult patients who underwent autologous hematopoietic stem cell transplantation (ASCT)

APPLICATIONS

- Chemotherapy or radiation-induced cytopenia
- Bone marrow failure
- Reduction of the hospitalization time after chemo- or radiotherapy

INTELLECTUAL PROPERTY

Patent application WO 2020/109520 ; EP, US, CA

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PUBLICATIONS

- Fouquet et al., *Pharmacological Research* 2019
- Sibon et al., *Cell Reports* 2019