

# Evaluation of the effect of growth factors on the mobilization and the genetic traits of stem cells and circulating tumor cells in the peripheral blood

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## 1. BACKGROUND

- HSCT currently uses G-CSF for the mobilization of progenitor cells in the peripheral blood. G-CSF however can have a significant role in cancer progression.
- Identifying growth factors that can influence the current outcomes of PBSCT in terms of better mobilization and increased tolerability could prove beneficial.
- Nongonadal tissues express gonadotropin receptors (LHCG-R) which are essential for their growth during fetal development.
- MSCs continue to express LHCG-R in the adulthood.
- MSCs have been shown to support hematopoiesis, tissue repair and reduce GVHD in PBSCT patients.
- HCG treatment could potentially stimulate the mobilization of more versatile MSCs in the peripheral blood and induce hematopoietic cell proliferation.

## 2. MATERIALS AND METHODS

- We evaluated the effect of hCG treatment on primary human cultures of bone marrow SCs. We assessed the proliferation rate and expression level of stemness genes.
- Next, we evaluated the effect of the treatment in an *in vivo* model of lymphoma developing mice undergoing PBSCT.



Figure 1. B6.Cg-Tg(IghMyc)22Bri/J mice

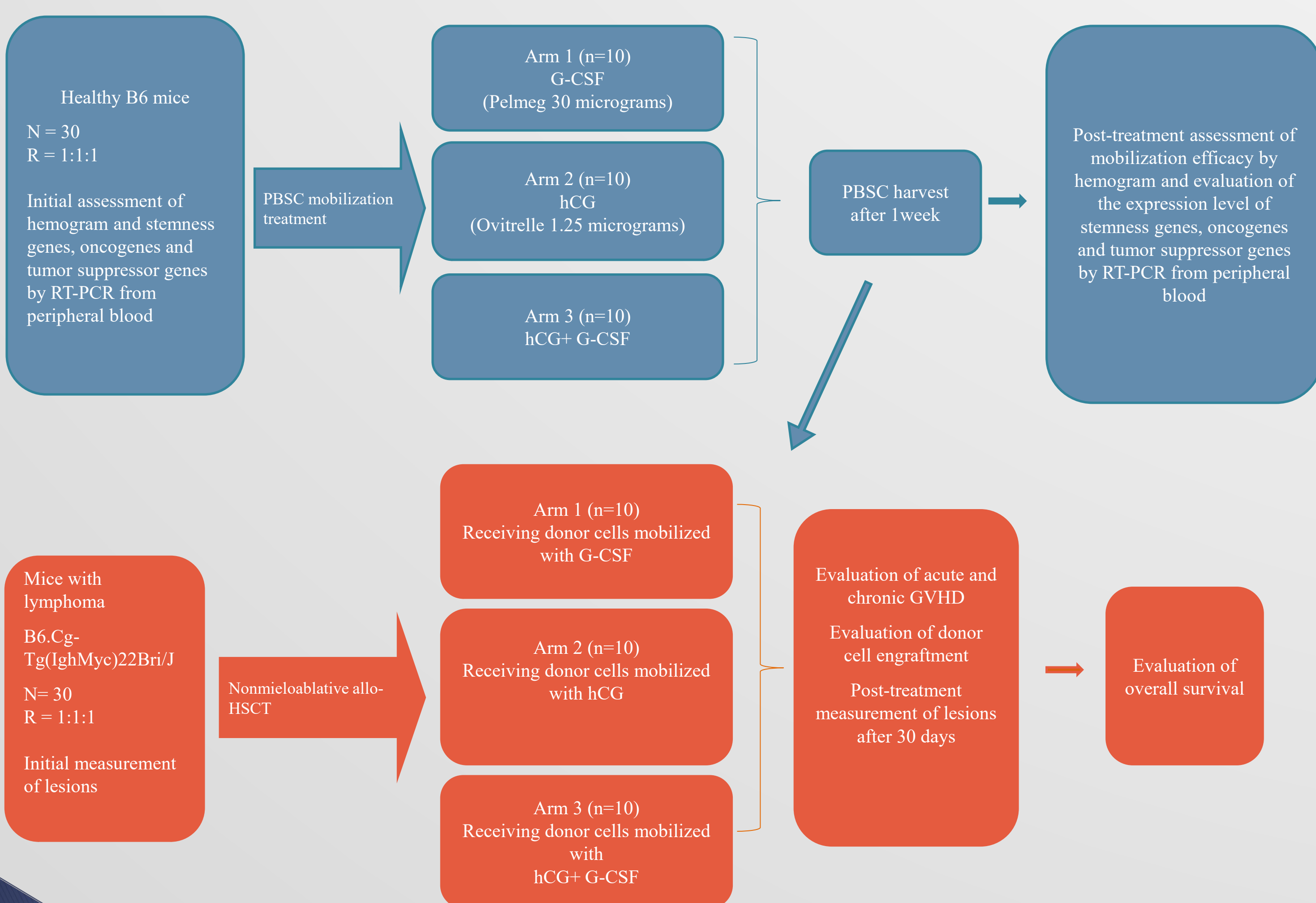


Figure 2. *in-vivo* study workflow

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## 3. RESULTS

- Our results *in vitro* showed a stimulating effect of hCG on the proliferation and expression of stemness genes in adherent bone marrow SCs (MSCs).

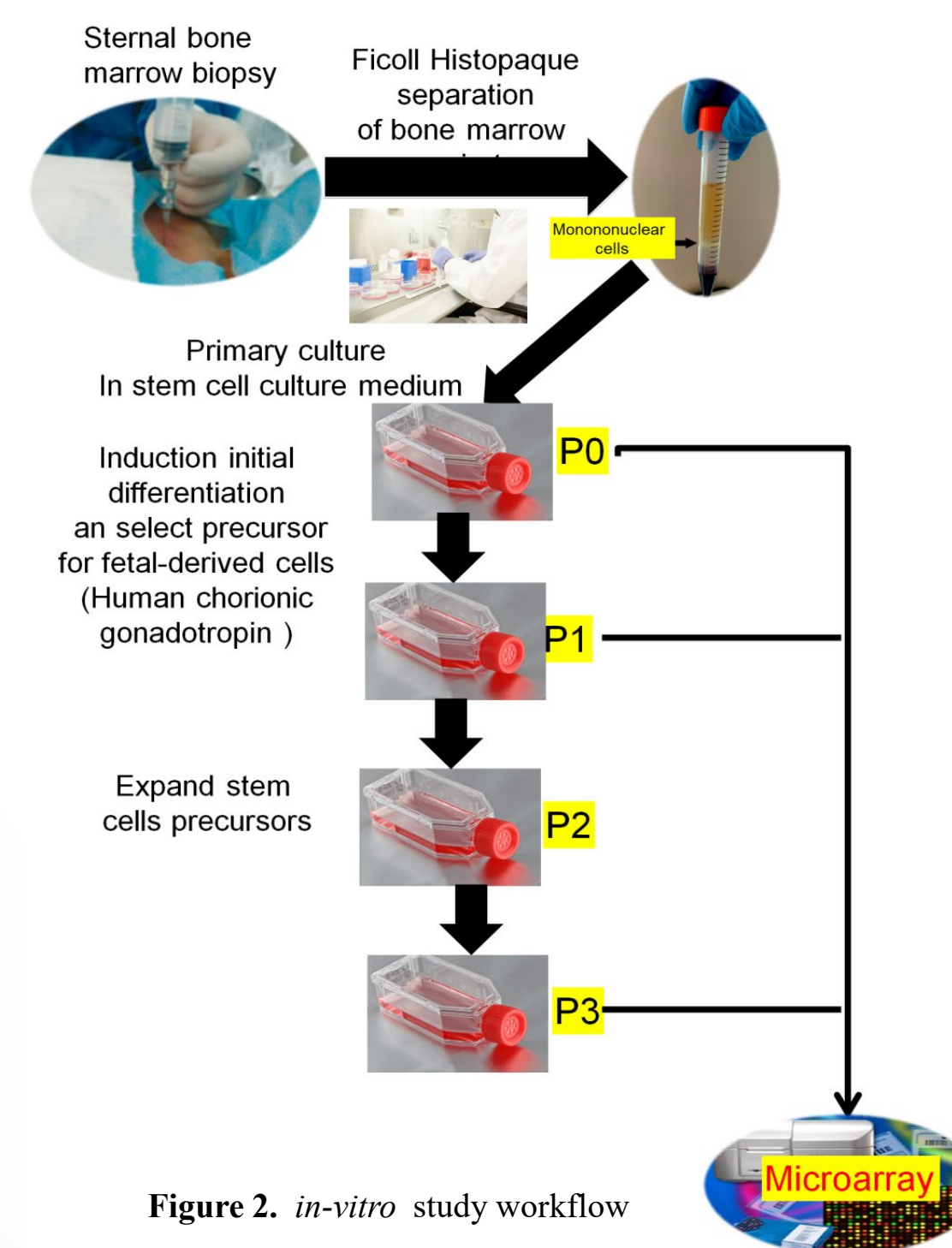


Figure 2. *in-vitro* study workflow

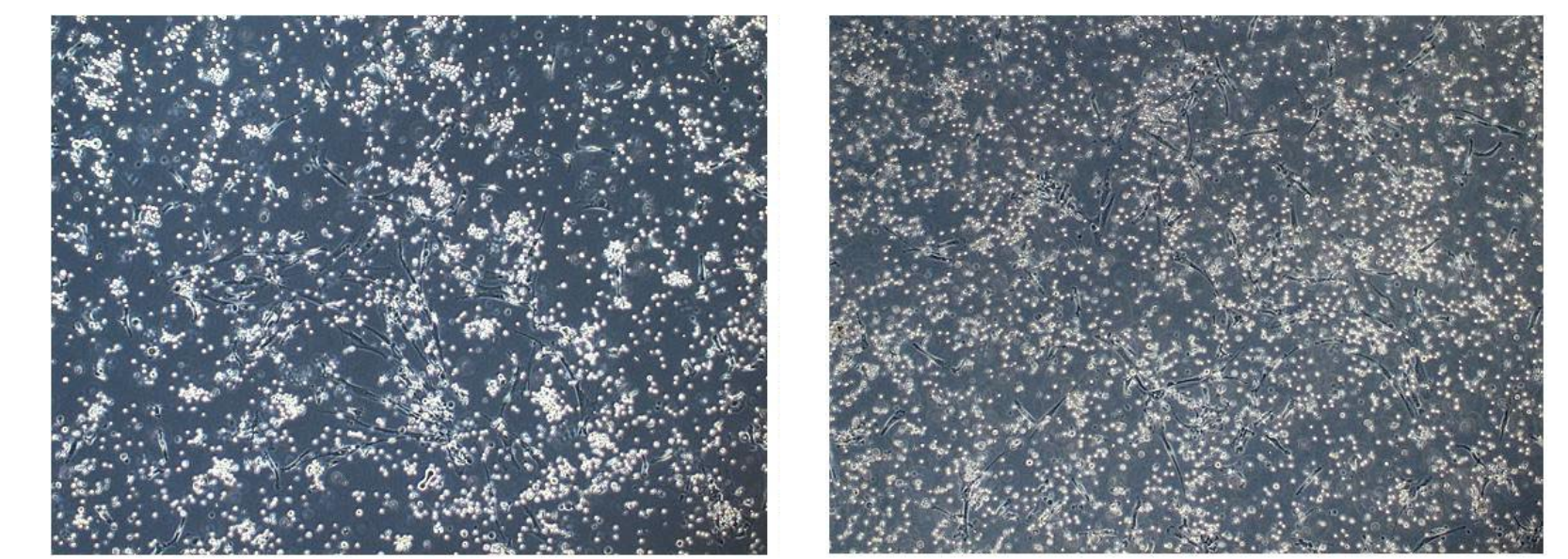


Figure 3. MSCs proliferation after hCG exposure, 5 days of primary culture

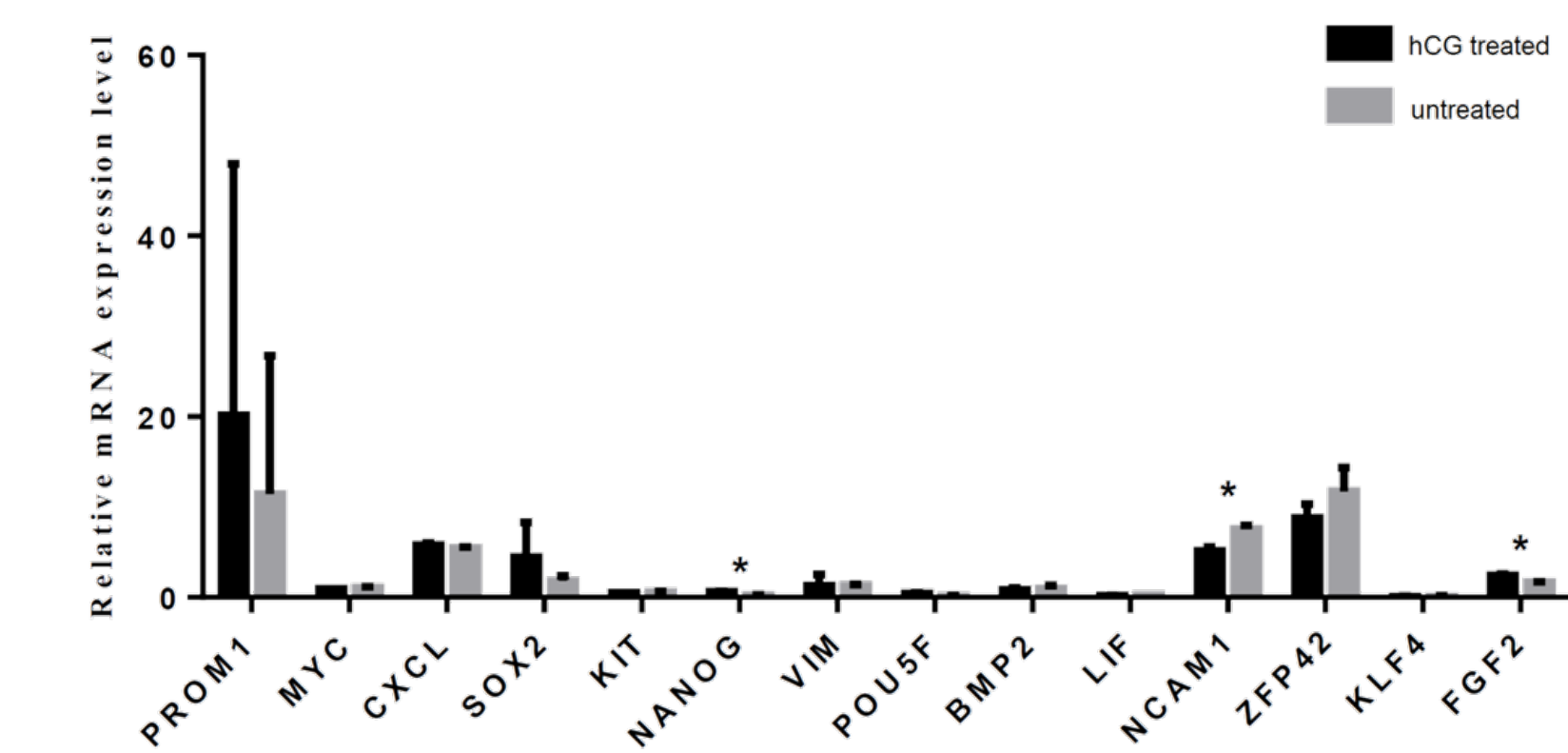


Figure 4. RT-qPCR evaluation of stemness gene expression

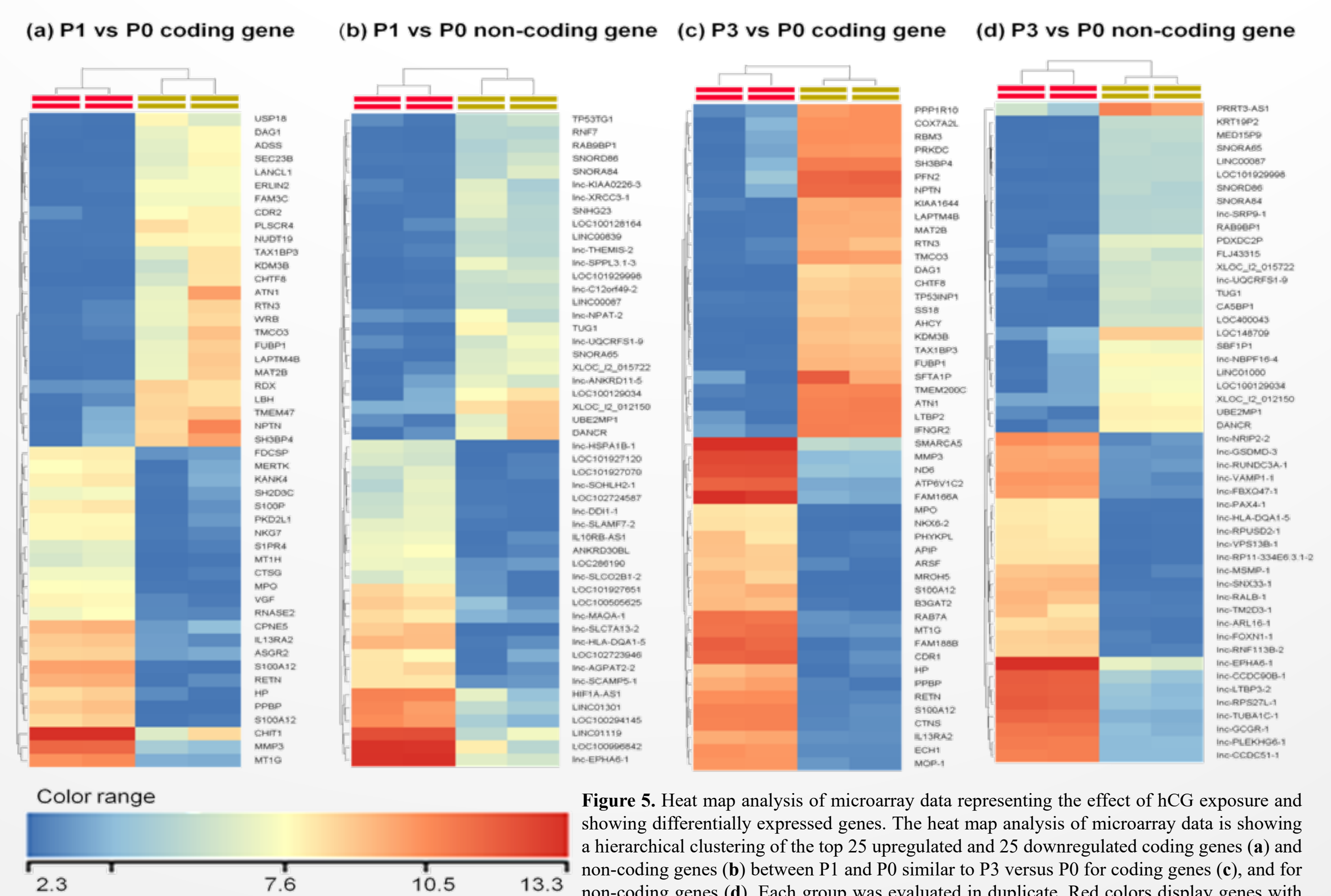


Figure 5. Heat map analysis of microarray data representing the effect of hCG exposure and showing differentially expressed genes. The heat map analysis of microarray data is showing a hierarchical clustering of the top 25 upregulated and 25 downregulated coding genes (a) and non-coding genes (b) between P1 and P0 similar to P3 versus P0 for coding genes (c), and for non-coding genes (d). Each group was evaluated in duplicate. Red colors display genes with an increased expression level and blue colors display genes with a reduced expression level.

- We are currently validating the *in-vivo* results of the expression profile of stemness genes, oncogenes and tumor suppression genes in stem cells and circulating tumor cells relative to the exposure to G-CSF, hCG or the combination of the two growth factors.

## 4. CONCLUSIONS

- Our findings bring new insights into the perspective of using hCG alone or in combination with G-CSF for SCs mobilization. This approach could improve the outcomes of PBSCT and may also represent a complementary therapeutic strategy for addressing granulocytopenia after chemotherapy.

## 5. REFERENCES

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Evaluation of the effect of human chorionic

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