In vitro megakaryocyte and platelet production

Commonly used acronym: *MK, PLT*

Created on: 20-01-2021 - Last modified on: 26-05-2022

Contact person

Kathleen Freson

Organisation

Name of the organisation Katholieke Universiteit Leuven (KUL)

Department Cardiovascular Sciences

Country Belgium

Geographical Area Flemish Region

SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Basic Research, Translational - Applied Research
Type of method	In vitro - Ex vivo
Used species	human
Targeted organ system or type of research	blood

DESCRIPTION

Method keywords

megakaryocyte

platelet

bone marrow

differentiation

Scientific area keywords

thrombocytopenia
platelet production
megakaryopoiesis

Method description

In vitro differentiation of hematopoietic stem cells (HSC) or inducible pluripotent stem cells (IPS) to megakaryocytes and platelets using specific differentiation conditions (liquid and 3D media). CRISPR/cas mutagenesis of HSC or IPS to study the effect of gene depletion or specific mutants on megakaryopoiesis and the production of platelets.

Lab equipment

- Cell culture equipment;
- FACS;
- Amaxa nucleotransfector;
- Cell culture reagents and specific cytokines;
- Molecular reagents and technologies.

Method status

Still in development
Internally validated
Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Reduces the need for producing KO mice or other functional mice studies.

Challenges

Impossible to generate high numbers of platelets that have the same characteristics as blood platelets.

Modifications

Other groups are working on improving the capacity of platelet generation (for transfusion purposes).

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

PMID: 30467204

PMID: 26936507

Coordinated by

Financed by