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

<table>
<thead>
<tr>
<th>The Method relates to</th>
<th>Human health</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Method is situated in</td>
<td>Basic Research, Translational - Applied Research</td>
</tr>
<tr>
<td>Type of method</td>
<td>In vitro - Ex vivo</td>
</tr>
<tr>
<td>Used species</td>
<td>human</td>
</tr>
<tr>
<td>Targeted organ system or type of research</td>
<td>blood</td>
</tr>
</tbody>
</table>

DESCRIPTION

Method keywords
megakaryocyte
platelet
bone marrow
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