# In vitro megakaryocyte and platelet production

**Commonly used acronym:** MK, PLT  
**Created on:** 20-01-2021 - **Last modified on:** 26-05-2022

## 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>This method makes use of</td>
<td>Animal derived cells / tissues / organs</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
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

Associated documents

PARTNERS AND COLLABORATIONS

Organisation
Name of the organisation Katholieke Universiteit Leuven (KUL)
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Flemish Region

Coordinated by

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