P. knowlesi model to study P. vivax

Commonly used acronym: Pk model

Contact person
Anna Rosanas-Urgell

Organisation
Name of the organisation: Institute of Tropical Medicine, Antwerp
Department: department of Biomedical Sciences
Country: Belgium

Partners and collaborations
Royal Veterinary College

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</td>
</tr>
<tr>
<td>Type of method</td>
<td>In vitro - Ex vivo</td>
</tr>
<tr>
<td>Specify the type of cells/tissues/organs</td>
<td>red blood cells</td>
</tr>
</tbody>
</table>

DESCRIPTION

Method keywords
P. knowlesi
P.vivax
malaria
transgenics
CRISPR-Cas9

Scientific area keywords
malaria
drug-resistance
genetics
parasitology

Method description
The lack of a continuous *in vitro* culture system for *P. vivax* has made it impossible to genetically engineer *P. vivax* for mechanistic research studies. One alternative that is being used is the infection of non-human primates, however this is restricted to few laboratories across the world. An additional alternative is the use of *P. knowlesi*, a *Plasmodium* species closely related to *P. vivax* that can be cultured *in vitro*. *P. knowlesi* is the zoonotic monkey parasite, which was adapted to grow in human erythrocytes. The ease of genetic manipulation of *P. knowlesi* using CRISPR-Cas9 methodologies and its successful use as surrogate for homologous genes of *P. vivax* make it an ideal model to study the function of *P. vivax* genes. We use genetic-engineering strategies in a *P. knowlesi* transgenic model to replace *P. knowlesi* genes with *P. vivax* homologues using CRISPR-Cas9 technology.

Lab equipment
- L2 culture facilities;
- Genomic platforms.

Method status
Internally validated
Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages
*P. knowlesi* transgenic model / *in vitro* culture allows to investigate gene function of *P. vivax* as an alternative model to *P. vivax* infection of non-human primates.
Challenges

The expression of P. vivax genes in a P. knowlesi parasite.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

Links

https://pubmed.ncbi.nlm.nih.gov/31205...