

# P. knowlesi model to study P. vivax

*Commonly used acronym: Pk model*

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## Contact person

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## 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

<b>The Method relates to</b>	Human health
<b>The Method is situated in</b>	Basic Research
<b>Type of method</b>	In vitro - Ex vivo
<b>Specify the type of cells/tissues/organs</b>	red blood cells

## 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/33654746/>

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

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