

## Plasmodium Specific

Plasmodium is a parasitic protozoa that causes the disease malaria. Malaria is a mosquito-borne illness that is widespread in tropical and subtropical regions across Sub-Saharan Africa and Asia and is a major cause of morbidity and mortality in these regions. There are several species of Plasmodium that cause disease including *P. malariae*, *P. vivax* and *ovale*, and *P. falciparum*. *P. falciparum* causes the most severe symptoms. Vast majority of deaths are caused by *P. falciparum* while *P. vivax*, *P. ovale*, and *P. malariae* cause a milder form that is rarely fatal. The classic symptom of cyclical fever and chills associated with malaria occurs every 2 days in *P. vivax* and *P. ovale* infections and every three days for *P. malariae*. *P. falciparum* however can cause daily cycles of fever that is almost continuous. Plasmodium falciparum can also cause the surface properties of infected red blood cells to change, causing them to adhere to blood vessels. This causes obstruction of the microcirculation and can occlude capillaries in the brain, kidney, and lungs. Plasmodium vivax and ovale are associated with persistent liver stages that allow relapse up to five years after elimination of the erythrocytic stage that can be treated with the addition of primaquine. Plasmodium vivax is also associated with the Duffy antigen, which is a receptor located on the surface of red blood cells that is the receptor for Plasmodium vivax. It is thought that the black population has a higher percentage of individuals missing the Duffy antigen, thus conferring resistance to this form of malaria.



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### Malariae

#### Mullet-mosquito

The species Plasmodium malariae causes a milder form of disease as compared to falciparum. This species is associated with a cyclical fever that occurs every 3 days. Asymptomatic infection can persist for years.

### Fever Every Three Days

#### Fever-beaver and (3) Tree

The species Plasmodium malariae causes a milder form of disease as compared to falciparum. This species is associated with a cyclical fever that occurs every 3 days.

### Vivax/Ovale

#### Violin Oval

These species of Plasmodium cause a milder form of disease as compared to falciparum. This species is associated with a cyclic fever that occurs every 2 days and is also associated with persistent liver stages that allow relapse up to five years after elimination of the erythrocytic stage.

### Fever Every Two Days

#### Fever-beaver in (2) Tutu

These species of Plasmodium cause a milder form of disease as compared to falciparum. This species is associated with a cyclic fever that occurs every 2 days.

### Duffy Antigen Binding Site

#### Duffle-bag Ant-gem

The Duffy antigen is a protein located on the surface of red blood cells and is a non-specific receptor for several chemokines. This receptor is also the receptor for Plasmodium vivax. Therefore, individuals whose erythrocytes do not express the receptor are believed to be more resistant to this form of malaria.

## Duffy often absent in Black Population

### Duffle-bag with White-ant

The Duffy antigen is a protein located on the surface of red blood cells and is a non-specific receptor for several chemokines. This receptor is also the receptor for Plasmodium vivax. It is thought the black population has a higher percentage of individuals missing the duffy antigen, thus conferring resistance to this form of malaria. Infection is still possible, however.

## Primaquine treats dormant form in liver

### Prom-queen smacking Dozing Liver

Plasmodium vivax and ovale is associated with persistent liver stages that allow relapse up to five years after elimination of the erythrocytic stage of disease. The dormant form in the liver can be treated with the addition of primaquine, which treats liver hypnozoites.

## Falciparum

### Faucet

Plasmodium falciparum is a species of Plasmodium that causes the most severe symptoms. Vast majority of deaths are caused by P. falciparum while P. vivax, P. ovale, and P. malariae cause a milder form that is rarely fatal.

## Most severe

### On fire

Plasmodium falciparum is a species of Plasmodium that causes the most severe symptoms. Vast majority of deaths are caused by P. falciparum while P. vivax, P. ovale, and P. malariae cause a milder form that is rarely fatal.

## Irregular Cycles

### Irregular Circle

The classic symptom of cyclical fever and chills associated with malaria occurs every 2 days in P. vivax and P. ovale infections and every three days for P. malariae. P. falciparum however, greatly varies in its paroxysms. Often, there is no distinct periodicity, but hovers around 48h. Of the Plasmodium strains, falciparum has the most unpredictable fever course.

## Occludes capillaries in the brain, kidneys, and lungs

### Caterpillar, Brain, Kidneys, and Lungs

Plasmodium falciparum can cause the surface properties of infected red blood cells to change, causing them to adhere to blood vessels. This causes obstruction of the microcirculation and can occlude capillaries in the brain, kidney, and lungs.