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.

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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.

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