**What Are the Different Types of Malaria Parasites?**

* Plasmodium falciparum (or P. falciparum)
* Plasmodium malariae (or P. malariae)
* Plasmodium vivax (or P. vivax)
* Plasmodium ovale (or P. ovale)
* Plasmodium knowlesi (or P. knowlesi)



The malaria parasite life cycle involves two hosts. During a blood meal, a malaria-infected female Anopheles mosquito inoculates sporozoites into the human host  . Sporozoites infect liver cells  and mature into schizonts , which rupture and release merozoites . (Of note, in P. vivax and P. ovale a dormant stage [hypnozoites] can persist in the liver (if untreated) and cause relapses by invading the bloodstream weeks, or even years later.) After this initial replication in the liver (exo-erythrocytic schizogony ), the parasites undergo asexual multiplication in the erythrocytes (erythrocytic schizogony ). Merozoites infect red blood cells . The ring stage trophozoites mature into schizonts, which rupture releasing merozoites . Some parasites differentiate into sexual erythrocytic stages (gametocytes) . Blood stage parasites are responsible for the clinical manifestations of the disease. The gametocytes, male (microgametocytes) and female (macrogametocytes), are ingested by an Anopheles mosquito during a blood meal . The parasites’ multiplication in the mosquito is known as the sporogonic cycle . While in the mosquito’s stomach, the microgametes penetrate the macrogametes generating zygotes . The zygotes in turn become motile and elongated (ookinetes)  which invade the midgut wall of the mosquito where they develop into oocysts . The oocysts grow, rupture, and release sporozoites, which make their way to the mosquito’s salivary glands. Inoculation of the sporozoites  into a new human host perpetuates the malaria life cycle.

 **Comparative properties of antimalarial drugs**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | PRE | ERYTHRO | ERYTH |  | Phase | Hypnozoite | Gamete | Resistance | Toxicity Grading |
| S/N | DRUG | Fal | Viv | Activity | Onset | Duration |  |  |  |  |
| 1 | Chloroquine | \_ | - | + | Fast | Long | \_ | - | Slow | + |
| 2 | Mefloquine  | \_ | - | + | Int | Long | \_ | - | Minor | ++ |
| 3 | Quinine | - | - | + | Int | Short | - | - | Minor | +++ |
| 4 | Proguanil | + | - | + | Int | Short | - | \* | Rapid | ± |
| 5 | .Pyrimethamine | \_ | - | + | Slow | Long | \_ | - | Rapid | + |
| 6 | Primaquine | + | + | - | - | - | + | + | Minor | ++ |
| 7 | Sulfonamides | \_ | - | ± | slow | Long | \_ | - | Minor | +± |
| 8 | Tetracyclines | \_ | - | + | slow | Short | \_ | - | Nil | + |
| 9 | Clindamycin | \_ | - | + | slow | Short | \_ | - | Nil | + |
| 10 | Artemisinin | \_ | - | + | Fastest | Short | \_ | + | Nil | + |
| 11 | Lumefantrine | \_ | - | + | Int | Long | \_ | - | Nil | + |

\*Do not kill gametes but may inhibit their development in mosquito.

Pre-erythro. — Preerythrocytic stage; Fal. — *P. falciparum*; Viv — *P. vivax*; Int — Intermediate