Abstract

Although malaria is a well-studied infectious disease, we are still unable to fight it effectively, as evidenced by a large number of infected people. Many drugs are available against malaria. However, because of incessantly emerging resistances, new, more effective antimalarials need to be developed. One possibility is to target the parasite's iron metabolism, the essential element of all organisms. Iron participates in DNA synthesis, respiration, energy production. It acts as a cofactor of ribonucleotide reductase, and metalloproteins with FeS clusters or heme. During the infection, the parasite must compete with the host for nutrients, including iron. The mechanism of iron uptake or excretion in malaria parasite is not completely clear. Only two iron transporters are known, but it is already evident, that there must be more of them. The *Plasmodium* parasite digests a large amount of hemoglobin, which is degraded into free heme and denatured globin. Free heme is toxic to the cell though. *Plasmodium* defends itself from the toxicity of free heme by forming chemically inert hemozoin. This unique mechanism of protection against the free heme toxicity is very useful for *Plasmodium* and other blood parasites, but it also becomes an advantageous target for drugs because the mechanism is present only in the parasite, not in the host. Another option for chemotherapy is to use the iron chelators. Chelators have a dual nature. They can either withhold iron and make it unavailable for the organism, or they can form a toxic complex with iron. The efficacy of chelators during the treatment of malaria is a bit contradictory. The most used chelator, in clinical practice, deferoxamine, has many disadvantages that make the treatment of malaria difficult. This is the reason for developing new compounds, which could eliminate these disadvantages. Therefore, iron chelators are still an interesting potential strategy concerning the treatment of malaria.

Key words: *Plasmodium*, malaria, iron metabolism, chemotherapeutics, chelators