

New Highly Effective Antimalarial Drug



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A female mosquito probes for a meal

A research organization has developed a chemically-altered form of a commonly prescribed osteoporosis drug that can easily enter red blood cells and dispatch malaria parasites without harming the host (in this case, a mouse). "The lead compounds are chemically modified forms of the bisphosphonate osteoporosis drugs Actonel (Risedronate) and Zometa (Zoledronate)." A typical hurdle facing many anti-malarial drugs is how to get them into the red blood cells where malaria-causing Plasmodium parasites reside. "The modified forms include a long lipid tail that helps them pass through the lipid-rich membrane of red blood cells, and also enhances the drug's ability to bind to the target enzyme, geranylgeranyl diphosphate synthase (GGPPS)."

As it turns out, the promising new compound impacts a biochemical pathway (termed isoprenoid biosynthesis) crucial for the parasite's sustenance and self-defense from the host's immune system. It works by effectively inhibiting GGPPS, an enzyme which is essential to the isoprenoid biosynthesis process.

The team observed the properties of nearly 1,000 different substances. "They found that compounds that were really active had a very long hydrocarbon chain." "These compounds can cross the cell membrane and work at very low concentrations." They pointed out that their team was the first to identify the GGPPS enzyme as a legitimate target in the battle against malaria.

Since many existing anti-malarial drugs frequently exhibit severe side-effects, the promise of a potentially non-toxic therapeutic comes as welcome news, indeed.

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