

ケミカルバイオロジー研究所

Research Institute for Chemical Biology

第 48 回 ケミカルバイオロジー研究所セミナー
第 129 回 生物科学フロンティアセミナー

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Artemisinin, a strange but useful organic endoperoxide from nature

令和 5 年 7 月 31 日 (月) 11:00~12:00

A12 棟 サイエンスホール

Artemisinin, a molecule isolated from the plant *Artemisia annua* L in the early 1970s, is widely used in Africa as a potent antimalarial. Artemisinin contains an endoperoxide group, a -C-O-O-C- moiety in the molecule. When artemisinin encounters an iron atom, the endoperoxide breaks up, and forms free radicals (molecule with unpaired electron). The highly reactive radicals, when formed in cells, can damage proteins, nucleic acids and other cellular structures. Malaria parasites contain large amount of heme-iron, a product from the digestion of hemoglobin within host red blood cells. Interaction of artemisinin with the intracellular heme-irons leads to facile death of the parasite. Interestingly, iron is an essential nutrient for almost all living organisms on earth. When cells become cancerous, more iron is needed to support their uncontrolled growth. In many cancer tissues, iron uptake mechanism through transferrin (iron transport protein) is upregulated. Artemisinin, therefore, becomes selectively toxic to cancer cells. We will present our work on engineered artemisinin to develop novel anti-cancer therapeutics.

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