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Gancidin W, a potential low-toxicity antimalarial agent isolated from an endophytic Streptomyces SUK10 (Article) (Open Access)

Zin, N.M.[a], Baba, M.S.[b], Zainal-Abidin, A.H.[c], Latip, J.[d], Mazlan, N.W.[e], Edrada-Ebel, R.[f]

[a]School of Diagnostic and Applied Health Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia
[b]Department of Biomedical Sciences, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Kuantan, Malaysia
[c]Department of Parasitology, Faculty of Medicine, Universiti Teknologi MARA, Shah Alam, Malaysia

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Abstract

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Endophytic Streptomyces strains are potential sources for novel bioactive molecules. In this study, the diketopiperazine gancidin W (GW) was isolated sfrom the endophytic actinobacterial genus Streptomyces, SUK10, obtained from the bark of Shorea ovalis tree, and it was tested in vivo against Plasmodium berghei PZZ1/100. GW exhibited an inhibition rate of nearly 80% at 6.25 and 3.125 ï¿½g kg^{-1} body weight on day four using the 4-day suppression test method on male ICR strain mice. Comparing GW at both concentrations with quinine hydrochloride and normal saline as positive and negative controls, respectively, 50% of the mice treated with 3.125 ï¿½g kg^{-1} body weight managed to survive for more than 11 months after infection, which almost reached the life span of normal mice. Biochemical tests of selected enzymes and proteins in blood samples of mice treated with GW were also within normal levels; in addition, no abnormalities or injuries were found on internal vital organs. These findings indicated that this isolated bioactive compound from Streptomyces SUK10 exhibits very low toxicity and is a good candidate for potential use as an antimalarial agent in an animal model. ï¿½ 2017 Zin et al.

Reaxys Database Information

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Author keywords

Antimalarial Endophytic Gancidin W In vivo Shorea ovalis Streptomyces

Indexed keywords

EMTREE drug terms: alanine aminotransferase alkaline phosphatase antimalarial agent aspartate aminotransferase gancidin w quinine unclassified drug antimalarial agent gancidin W piperazine derivative

EMTREE medical terms: alanine aminotransferase blood level, alkaline phosphatase blood level, animal experiment, animal model, animal tissue, antimalarial activity, Article, aspartate aminotransferase blood level, controlled study, drug dose comparison, drug efficacy, drug identification, drug isolation, drug purification, drug purity, drug screening, drug structure, enzyme activity, in vivo study, male, nonhuman, Plasmodium berghei, Plasmodium berghei infection, protein blood level, protein determination, Streptomyces, survival time, animal, chemistry, conformation, disease model, dose response, drug effects, drug sensitivity, Institute for Cancer Research mouse, isolation and purification, malaria, mouse, parasitology

MeSH: Animals, Antimalarials, Disease Models, Animal, Dose-Response Relationship, Drug, Malaria, Male, Mice, Mice, Inbred ICR, Molecular Conformation, Parasitic Sensitivity Tests, Piperazines, Plasmodium berghei, Streptomyces

Chemicals and CAS Registry Numbers:

alanine aminotransferase, 9000-86-6, 9014-30-6; alkaline phosphatase, 9001-78-9; aspartate aminotransferase, 9000-97-9; quinine, 130-89-2, 130-95-0, 14358-44-2, 549-48-4, 549-49-5, 60-93-5, 7549-43-1;

Antimalarials; gancidin W; Piperazines

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Zin, N.M.; School of Diagnostic and Applied Health Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, Kuala Lumpur, Malaysia; email:noraziah.zin@ukm.edu.my

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