

植物の"チカラ"を利用した新しい抗真菌剤 New antifungal agent using the "Plant Power"

【Keywords】

antifungal agent

defensin

rice

peptide

superficial mycosis

■Summary

Superficial mycosis such as schistosomiasis is a serious disease that affects one out of every five to ten people. We found that the rice defensin OsAFP1 exhibits antifungal activity against human pathogenic fungi by a specific mechanism. We also designed a short-chain peptide, OsAFP1-8L, which exhibits a similar mechanism of action as OsAFP1. This peptide may be a new approach for the treatment of fungal infections that inhibits the development of multidrug-resistant fungi.

■Subject Details/Topic

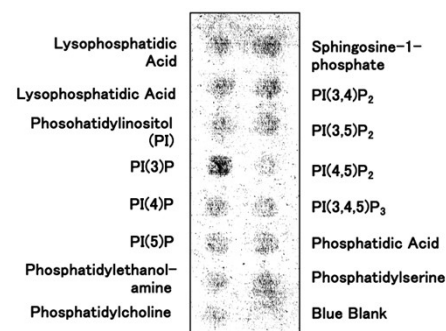
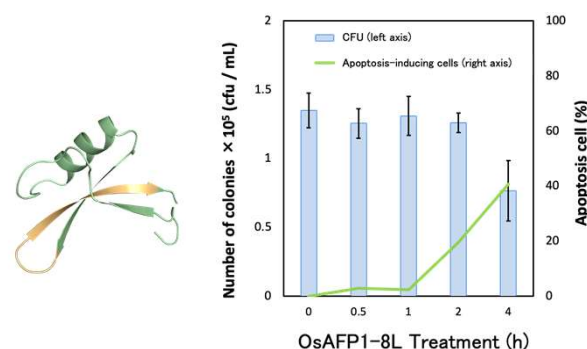
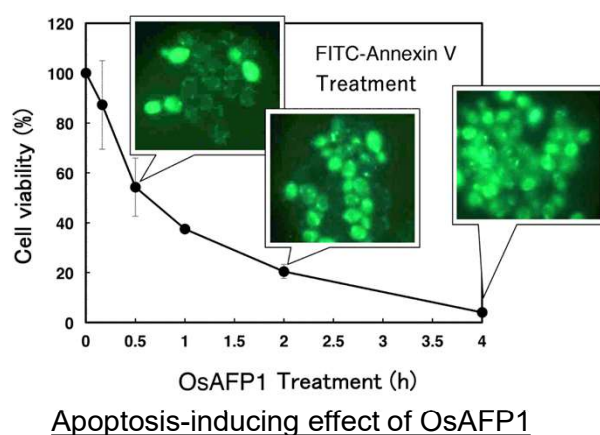
Defensins are antibacterial peptides that function in the innate immune system. We found that OsAFP1, which consists of 49 amino acid residues, exhibits antifungal activity against human pathogenic fungi by inducing apoptosis. Furthermore, OsAFP1-8L, which was designed from the structure of OsAFP1, showed strong antifungal activity comparable to that of OsAFP1.

FITC-labeled peptide and peptide-lipid interaction analysis showed that OsAFP1-8L accumulated on the cell membrane surface and bound to PI(3)P, a lipid component present in the plasma membrane. Gene expression analysis revealed increased expression of genes related to cell wall organization or biosynthesis, ion transport, and response to osmotic stress.

OsAFP1-8L has a novel mechanism of action that affects the fungal cell wall and also affects intracellular and extracellular ion transport and signaling pathways.

■We hope to collaborate with...

Drug discovery (e.g., antifungal agents)



Peptide-Lipid Interaction analysis