Ekspresi trasporter PMAA 067100 Penicillium marneffei pada Saccharomyces cerevisiae ADΔ untuk menguji resistensi terhadap antifungi = The expression of PMAA 067100 Penicillium marneffei transporter in Saccharomyces cerevisiae ADΔ for testing the antifungal resistance

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Abstrak

[Penicillium marneffei merupakan fungi patogen yang ditemukan di Asia Tenggara, khususnya Thailand. Penisiliosis dapat menyebabkan mikosis sistemik sehingga membahayakan nyawa penderita immunocompromised, khususnya penderita HIV/AIDS. Antifungi seperti Fluconazole dan Ketoconazole, digunakan untuk mengatasi infeksi P. marneffei. Akan tetapi, penggunaan antifungi secara jangka panjang dapat memicu kemungkinan munculnya mutan resisten P. marneffei. Resistensi pada fungi dapat dipengaruhi beberapa faktor, salah satunya, overekspresi transporter pengeluaran obat (drug efflux transporter). Mekanisme pompa pengeluaran obat diatur oleh berbagai transporter. Transporter yang paling umum diketahui ialah transporter ABC (ATP-binding-cassette) dan MFS (Major Facilitator Superfamily). Transporter ABC multidrug (MDR) pada P. marneffei telah dipelajari dengan baik, sedangkan transporter MFS MDR pada fungi tersebut, belum mendapatkan perhatian yang sama. Penelitian ini fokus pada satu transporter MFS MDR P. marneffei, yakni PMAA 067100, yang diekspresikan pada Saccharomyces cerevisiae ADΔ; sistem ekspresi yang sangat rentan terhadap berbagai macam antifungi. Pengamatan melalui mikroskop konfokal dan uji Disk Diffusion menunjukkan bahwa transporter PMAA 067100 terlokalisasi pada membran sel S. cerevisiae ADΔ dan resisten terhadap Fluconazole dan Terbinafine.;Penicillium marneffei has been known as a pathogenic fungi which is found in Southeast Asia, especially Thailand. The infection by this fungi recognized as Penicilliosis, that caused systemic mycosis, might be lethal in immunocompromised patient, specifically HIV/AIDS patient. Antifungal such as Fluconazole and Ketoconazole, had been used against P. marneffei infection. However, the long-term-use of antifungal might cause an emerging resistant strain of P. marneffei. The resistance phenomenon in fungi is caused by several factors, one of it is the overexpression of drug efflux transporter. Mechanism of this efflux pump is regulated by some of transporters such as ABC (ATP-binding-cassette) and MFS (Major Facilitator Superfamily) transporter. The ABC multidrug (MDR) transporter of P. marneffei has been studied well, yet the underrated MFS MDR transporter of the same fungi has not received the same attention. This study focus on one of P. marneffei MFS MDR transporter, known as PMAA 067100, which was expressed in Saccharomyces cerevisiae ADΔ; an expression system which is

very susceptible to many kind of antifungal. Observation through confocal microscope and Disk Diffusion test showed that PMAA 067100 transporter was localized in S. cerevisiae ADΔ cell membrane and resistant against Fluconazole and Terbinafine., Penicillium marneffei has been known as a pathogenic fungi which is found in Southeast Asia, especially Thailand. The infection by this fungi recognized as Penicilliosis, that caused systemic mycosis, might be lethal in immunocompromised patient, specifically HIV/AIDS patient. Antifungal such as Fluconazole and Ketoconazole, had been used against P. marneffei infection. However, the long-term-use of antifungal might cause an emerging resistant strain of P. marneffei. The resistance phenomenon in fungi is caused by several factors, one of it is the overexpression of drug efflux transporter. Mechanism of this efflux pump is regulated by some of transporters such as ABC (ATP-binding-cassette) and MFS (Major Facilitator Superfamily) transporter. The ABC multidrug (MDR) transporter of P. marneffei has been studied well, yet the underrated MFS MDR transporter of the same fungi has not received the same attention. This study focus on one of P. marneffei MFS MDR transporter, known as PMAA 067100, which was expressed in Saccharomyces cerevisiae ADΔ; an expression system which is very susceptible to many kind of antifungal. Observation through confocal microscope and Disk Diffusion test showed that PMAA 067100 transporter was localized in S. cerevisiae ADΔ cell membrane and resistant against Fluconazole and Terbinafine.]