

Ekspresi trasporter PMAA 067100 *Penicillium marneffei* pada *Saccharomyces cerevisiae* AD&#916; untuk menguji resistensi terhadap antifungi = The expression of PMAA 067100 *Penicillium marneffei* transporter in *Saccharomyces cerevisiae* AD&#916; 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 trasporter pengeluaran obat (drug efflux transporter). Mekanisme pompa pengeluaran obat diatur oleh berbagai trasporter. Trasporter yang paling umum diketahui ialah trasporter ABC (ATP-binding-cassette) dan MFS (Major Facilitator Superfamily). Trasporter ABC multidrug (MDR) pada *P. marneffei* telah dipelajari dengan baik, sedangkan trasporter MFS MDR pada fungi tersebut, belum mendapatkan perhatian yang sama. Penelitian ini fokus pada satu trasporter MFS MDR *P. marneffei*, yakni PMAA 067100, yang diekspresikan pada *Saccharomyces cerevisiae* AD&#916;; sistem ekspresi yang sangat rentan terhadap berbagai macam antifungi. Pengamatan melalui mikroskop konfokal dan uji Disk Diffusion menunjukkan bahwa trasporter PMAA 067100 terlokalisasi pada membran sel *S. cerevisiae* AD&#916; 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* AD&#916;; 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* AD#916; 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* AD#916;; 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* AD#916; cell membrane and resistant against Fluconazole and Terbinafine.]