

Supporting Information

Diatretol, an α , α' -dioxo-diketopiperazine, is a potent *in vitro* and *in vivo* antimalarial

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Fig. S1. Structures of naturally occurring α , α' -dioxo-diketopiperazines

Fig. S2. *In vitro* antimalarial activity of diatretole (1)

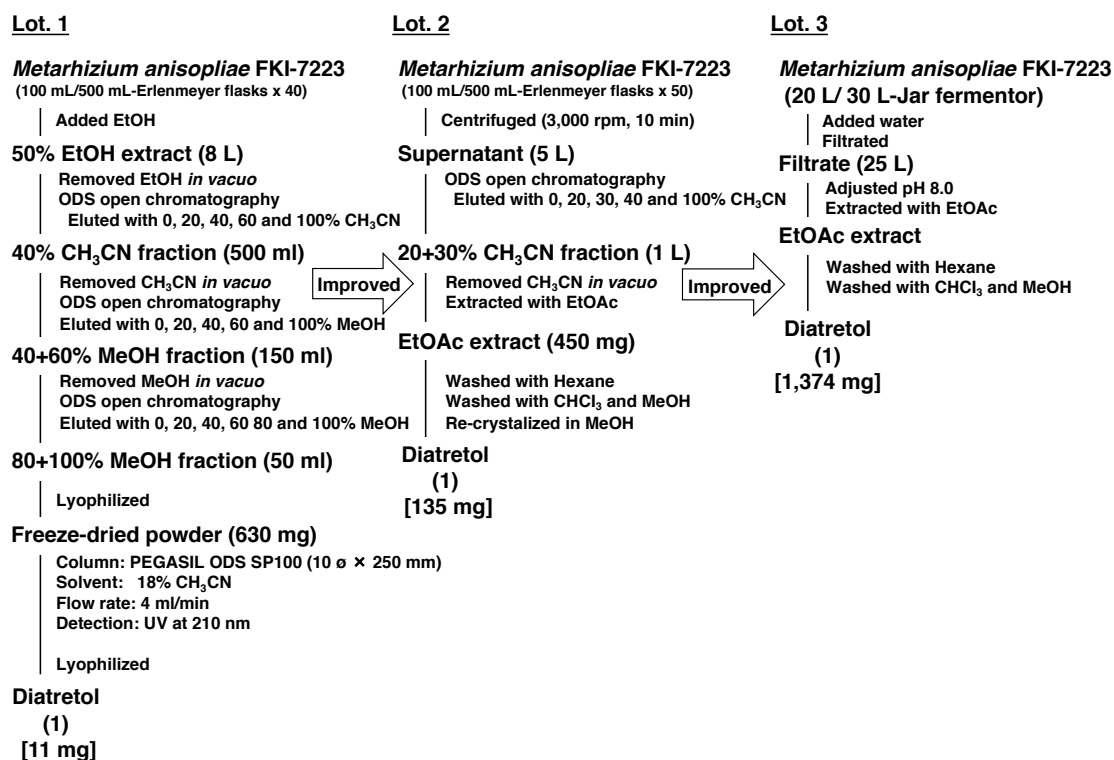
S1. Isolation and taxonomy of *Metarhizium anisopliae* FKI-7223

The fungal strain FKI-7223 isolated from a soil around root of *Angelica keiskei* collected in Nijima, Izu Islands, Tokyo, Japan. This strain was identified with genus *Metarhizium* by producing branched conidiophores, with apices of branches bearing one to several phialides, and producing conidial chains. The ITS sequence of FKI-7223 was compared to sequences in the GenBank database by BLASTN 2.11.0 analysis (Stephen et al. 1997). The sequence of FKI-7223 was 99.8% similar to the sequence of AESEF 7487 (ex-type of *Metarhizium anisopliae*, GenBank accession number NR_132017). The producing strain FKI-7223 was assigned to the genus *Metarhizium* based on its morphology and sequence analysis.

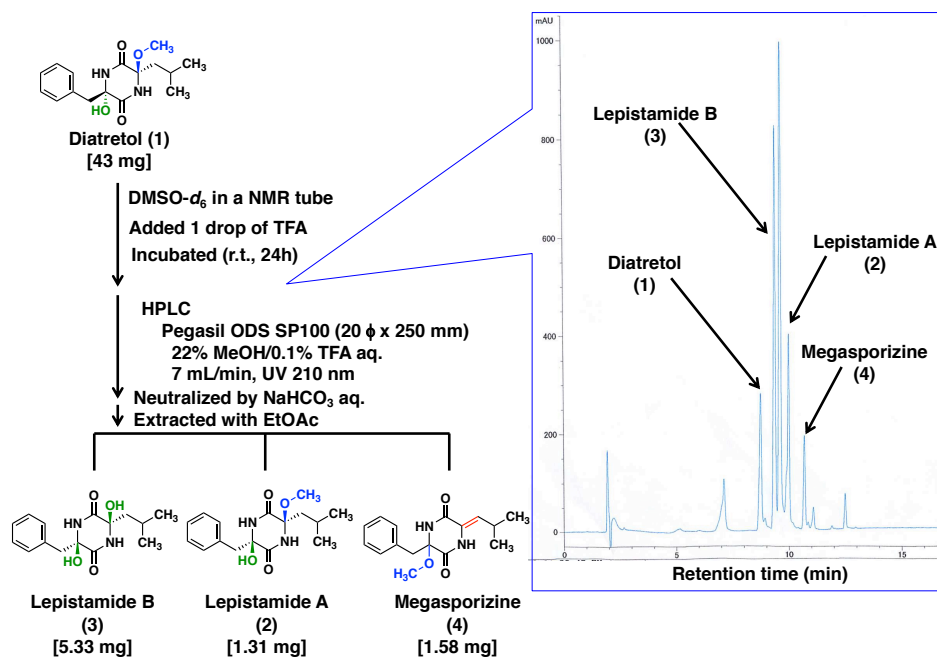
Reference

Stephen F. Altschul, Thomas L. Madden, Alejandro A. Schäffer, Jinghui Zhang, Zheng Zhang, Webb Miller, and David J. Lipman (1997), "Gapped BLAST and PSI-BLAST: a new generation of protein database search programs", *Nucleic Acids Res.* 25:3389-3402.

Scheme S1. Fermentation and isolation of diatretole (1) from *Metarhizium anisopliae* FKI-7223



Scheme S2. Preparation of lepistamide A (2), lepistamide B (3), and megasporizine (4) from diatretole (1)



Scheme S3. Preparation of albonoursin (5) from diatretole (1)

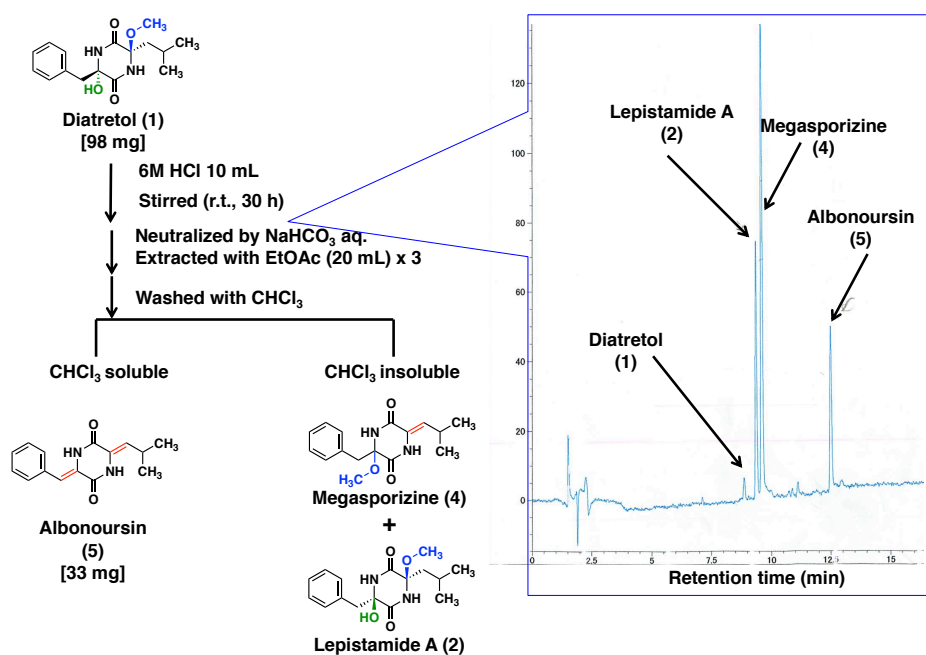
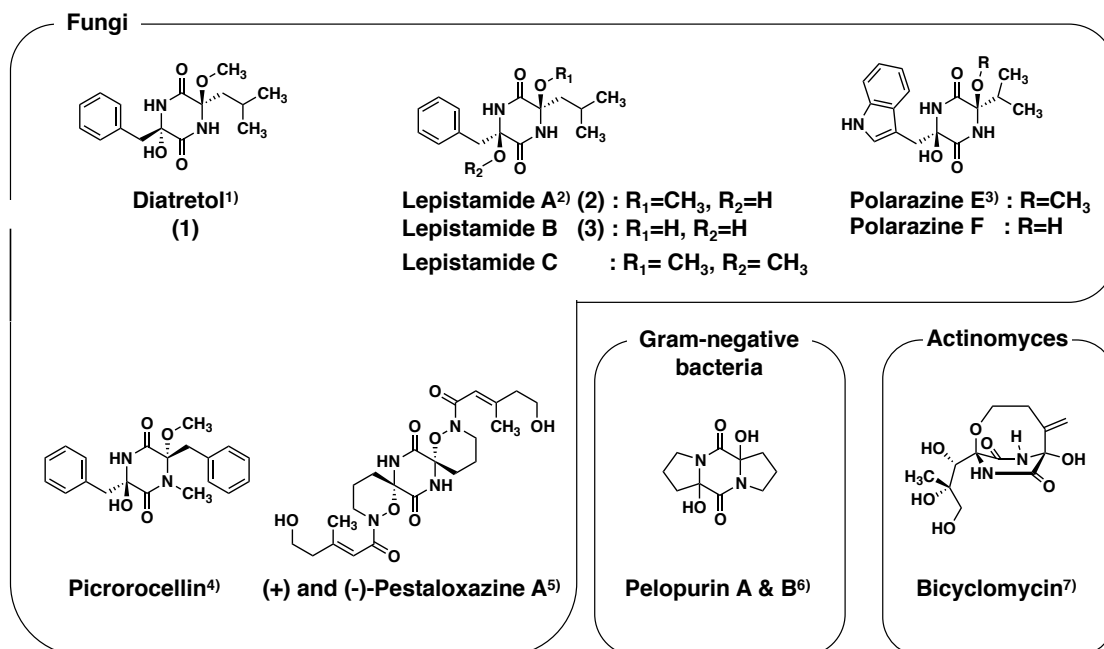


Fig. S1. Structures of naturally occurring α, α' -dioxo-diketopiperazines



1) *Leibigs Ann.* 11, 1875 (1996)

4) *J. Chem. Soc.* 816 (1922)

6) *Nat. Prod. Res.*, 28, 680 (2014)

2) *Helv. Chem. Acta* 94, 1426 (2011)

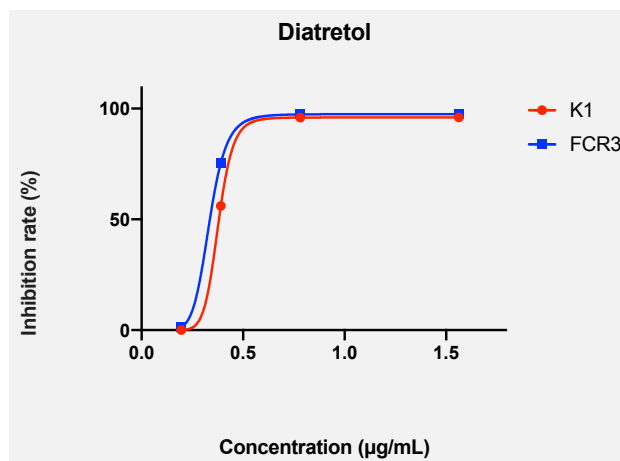
5) *Tetrahedron Lett.*, 24, 1445 (1983)

7) *J. Antibiot.*, 25, 582 (1972)

3) *Phytochemistry* 58, 905 (2001)

5) *Org. Lett.*, 17, 4216 (2015)

Fig. S2. *In vitro* antimalarial activity of diatretol (1)



X	K1			FCR3		
	Mean	SD	N	Mean	SD	N
1.5625	95.9883333	0.24826062	3	97.4866667	0.30022214	3
0.78125	95.941	0.08313844	3	97.3706667	0.60855265	3
0.390625	56.065	0.87527196	3	75.5273333	1.17966789	3
0.195313	0	0	3	1.30966667	1.14739807	3