

**To mate or tomato?**

## Fungal sex receptors recalibrated to track host signals

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植物病原菌は、どのように宿主植物を見つけ、感染しているのだろうか？ Turra ら (2015) は、*Fusarium oxysporum* の MAPK シグナル経路の遺伝子破壊株を用いて、植物からの化学シグナルを伝達する経路を調査した。その結果、Mpk1 が植物滲出物の受容に続くシグナル伝達に関わることが明らかになった。また、 $\alpha$ -pheromone の受容体 Ste2 は、植物からの化学シグナルの受容に関わっていた。

*F. oxysporum* は交配不全性の糸状菌であるにも関わらず、ゲノム配列中にはフェロモン前駆体や受容体の遺伝子が保持されている。本報告は、交配不全性菌にとって不要と考えられる、性フェロモンシグナル経路の機能を明らかにした点が興味深い。これらシグナル伝達に関わる MAP kinase や受容体は、*F. oxysporum* の感染行動阻害剤のターゲットとしての利用が期待される。

**紹介論文**

Fungal pathogen uses sex pheromone receptor for chemotropic sensing of host plant signals.

Turra et al. *Nature* (2015) **527**: 521–524

**Abstract**

For more than a century, fungal pathogens and symbionts have been known to orient hyphal growth towards chemical stimuli from the host plant. However, the nature of the plant signals as well as the mechanisms underlying the chemotropic response have remained elusive. Here we show that directed growth of the soil-inhabiting plant pathogen *Fusarium oxysporum* towards the roots of the host tomato (*Solanum lycopersicum*) is triggered by the catalytic activity of secreted class III peroxidases, a family of haem-containing enzymes present in all land plants. The chemotropic response requires conserved elements of the fungal cell integrity mitogen-activated protein kinase (MAPK) cascade and the seven-pass transmembrane protein Ste2, a functional homologue of the *Saccharomyces cerevisiae* sex pheromone  $\alpha$  receptor. We further show that directed hyphal growth of *F. oxysporum* towards nutrient sources such as sugars and amino acids is governed by a functionally distinct MAPK cascade. These results reveal a potentially conserved chemotropic mechanism in root-colonizing fungi, and suggest a new function for the fungal pheromone-sensing machinery in locating plant hosts in a complex environment such as the soil.