



VeA, a Global Regulator of Secondary Metabolism, Can Increase Production of Secondary Metabolites

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WARF: P09056US02

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing methods of using VeA, a newly identified global regulator of secondary metabolism, to increase or decrease production of secondary metabolites in fungi.

Overview

Microorganisms, such as fungi, produce a variety of secondary metabolites. These secondary metabolites display a broad range of activities, including antibiotic, immunosuppressant, phytotoxic and mycotoxic activities, and are useful for drug or technological development. For example, the antibiotic penicillin and the cholesterol-lowering drug lovastatin are secondary metabolites.

However, producing large amounts of secondary metabolites is difficult, and available techniques often provide unpredictable results. Because they are formed from a relatively small number of metabolic pathways, identifying the genes that control these pathways may provide an alternative method of generating secondary metabolites.

The inventors previously identified a global regulator of secondary metabolism, called LaeA, in fungi (see WARF reference number P02379US). Overexpression of the *laeA* gene upregulates production of secondary metabolites, greatly increasing penicillin production in *Aspergillus nidulans* and lovastatin production in *A. terreus*. On the other hand, deletion of *laeA* in *A. fumigatus* eliminates the production of gliotoxin and other secondary metabolites, decreasing the virulence of this human pathogen.

The Invention

UW-Madison researchers now have identified another global regulator of secondary metabolism, called VeA. VeA is a conserved protein that interacts with LaeA in an as yet unknown mechanism. Overexpression of *veA* upregulates secondary metabolism in *A. flavus* to a greater degree than overexpression of *laeA*. This gene could be used to increase the production of important natural products, including novel products with medicinal value.

Applications

- Increasing production of useful secondary metabolites, such as penicillin or lovastatin
- Decreasing production of toxic secondary metabolites, such as aflatoxin

Key Benefits

- Provides a simple method of increasing or decreasing secondary metabolite production
- Upregulates secondary metabolism to a greater degree than LaeA
- May enable new treatments for fungal infections
- May be used to identify new secondary metabolite biosynthesis gene clusters

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Additional Information

For More Information About the Inventors

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Related Technologies

- [See WARF reference number P02379US for more information on LaeA, another global regulator of secondary metabolism.](#)

Related Intellectual Property

- [View Continuation Patent in PDF format.](#)

Publications

- Bayram O., Krappmann S., Ni M., Bok J.W., Helmstaedt K., Valerius O., Braus-Stromeyer S., Kwon N.J., Keller N.P., Yu J.H. & Braus G.H. 2008. VelB/VeA/LaeA Coordinated Light Information, Fungal Development and Secondary Metabolism. *Science* 320, 1504-1506.
- Amaike S. & Keller N.P. 2009. Distinct Roles for VeA and LaeA in Development and Pathogenesis of *Aspergillus flavus*. *Eukary. Cell* 8, 1051-1060.

Tech Fields

- [Drug Discovery & Development : Drug production & design](#)

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