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Molecular Plant-Microbe Interactions
Volume 31, Issue 1, January 2018, Pages 101-111

Inappropriate expression of an NLP effector in *Colletotrichum orbiculare* impairs infection on cucurbitaceae cultivars via plant recognition of the C-terminal region (Article)

Azmi, N.S.A.^a, Singkaravanit-Ogawa, S.^a, Ikeda, K.^a, Kitakura, S.^a, Inoue, Y.^a, Narusaka, Y.^b, Shirasu, K.^c, Kaido, M.^a, Mise, K.^a, Takano, Y.^a [✉](#) [👤](#)

^aGraduate School of Agriculture, Kyoto University, Kyoto, Japan

^bResearch Institute for Biological Sciences Okayama, Okayama, Japan

^cRIKEN Center for Sustainable Resource Science, Yokohama, Japan

Abstract

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The hemibiotrophic pathogen *Colletotrichum orbiculare* preferentially expresses a necrosis and ethylene-inducing peptide 1 (Nep1)-like protein named NLP1 during the switch to necrotrophy. Here, we report that the constitutive expression of NLP1 in *C. orbiculare* blocks pathogen infection in multiple Cucurbitaceae cultivars via their enhanced defense responses. NLP1 has a cytotoxic activity that induces cell death in *Nicotiana benthamiana*. However, *C. orbiculare* transgenic lines constitutively expressing a mutant NLP1 lacking the cytotoxic activity still failed to infect cucumber, indicating no clear relationship between cytotoxic activity and the NLP1-dependent enhanced defense. NLP1 also possesses the microbe-associated molecular pattern (MAMP) sequence called nlp24, recognized by *Arabidopsis thaliana* at its central region, similar to NLPs of other pathogens. Surprisingly, inappropriate expression of a mutant NLP1 lacking the MAMP signature is also effective for blocking pathogen infection, uncoupling the infection block from the corresponding MAMP. Notably, the deletion analyses of NLP1 suggested that the C-terminal region of NLP1 is critical to enhance defense in cucumber. The expression of mCherry fused with the C-terminal 32 amino acids of NLP1 was enough to trigger the defense of cucurbits, revealing that the C-terminal region of the NLP1 protein is recognized by cucurbits and, then, terminates *C. orbiculare* infection. © 2018 The American Phytopathological Society.

SciVal Topic Prominence [ⓘ](#)

Topic: Magnaporthe | *Oryza sativa* | plant infection

Prominence percentile: 95.306 [ⓘ](#)

Reaxys Database Information

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Indexed keywords

EMTREE drug terms: [fungal protein](#)

EMTREE medical terms: [amino acid sequence](#) [cell death](#) [chemistry](#) [Colletotrichum](#) [Cucurbitaceae](#)

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de Queiroz, C.B. , Correia, H.L.N. , Santana, M.F.
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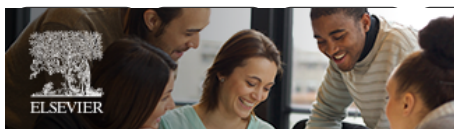
Focal effector accumulation in a biotrophic interface at the primary invasion sites of *Colletotrichum orbiculare* in multiple susceptible plants

Irieda, H. , Ogawa, S. , Takano, Y.
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Colletotrichum orbiculare secretes virulence effectors at a biotrophic interface at the primary hyphal neck via

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(2016) *Physiological and Molecular Plant Pathology*

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Chemicals and CAS Registry Numbers:

Fungal Proteins

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Funding sponsor	Funding number	Acronym
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Akita Prefectural University	15H05780	
Ministry of Education, Culture, Sports, Science and Technology		MEXT

Funding text

We thank Y. Kubo (Kyoto Prefectural University, Japan) for *C. orbiculare* cst1 mutant RCS2-1. This work was supported in part by Grants-in-Aid for Scientific Research (15H05780 and 15H04457) from the Ministry of Education, Culture, Sports, Science and Technology of Japan, by an Institution for Fermentation, Osaka (IFO) research grant, and by the Science and Technology Research Promotion Program for Agriculture, Forestry, Fisheries and Food industry.

ISSN: 08940282

CODEN: MPMIE

Source Type: Journal

Original language: English

DOI: 10.1094/MPMI-04-17-0085-FI

PubMed ID: 29059009

Document Type: Article

Publisher: American Phytopathological Society

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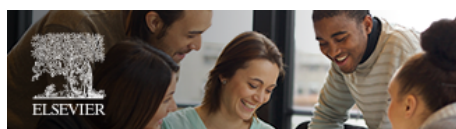
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