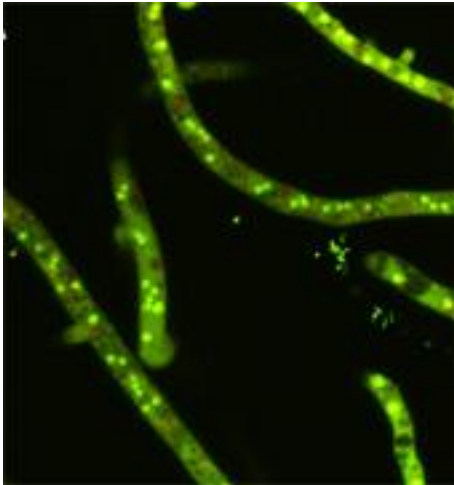


FUNGUS AGAINST FUNGUS - FUNGICIDE FROM PENICILLIUM

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Press release from: [Austrian Science Fund FWF](#)



A fungus protein that attacks pathogenic fungi is the focal point of a project recently launched by the Austrian Science Fund FWF. As well as examining the structure of the protein, the project will also closely analyse the physiological changes that it causes in the cells of pathogenic fungi. Combined with findings from an earlier project, the new data could form the basis for the development of an effective treatment of certain fungal infections.

PAF, NAF, AFP and ANAPF make up the new class of proteins that can restrict the growth of certain hyphomycetes - and which are themselves a product of this type of fungi. Although one can only speculate about their biological function, they offer enormous potential for the development of an effective treatment of fungal infections in plants, animals and people. Prof. Florentine Marx from the Biocenter of Innsbruck Medical University has been working on one of these proteins - PAF, or Penicillium Antifungal Protein - for several years. The Austrian Science Fund FWF has been providing ongoing support for her work since 2001 and is now continuing this support.

A SHINING EXAMPLE

During the new project, Prof. Marx's team will be using a modified strain of the PAF-sensitive fungus *Aspergillus nidulans* as a model organism. As the concentration of calcium ions in the cells of this fungus increases, it produces light emissions that can be measured. Prof. Marx explains the significance of calcium in this context: "Calcium acts as a universal signal that controls certain processes in the cells. A gradient of the ion controls growth in the filamentous fungus cells, or hyphae. The exposure to small amounts of PAF in the hyphae of *A. nidulans* leads to a significant increase in the concentration of calcium and a major change in growth patterns. During this new project, we will be investigating whether these developments are linked and, if so, how."

Another aim of the project is to identify mutated forms of *A. nidulans* that are resistant to PAF. By analysing these mutated fungi, the project team will characterise any molecular targets that must be responsible for sensitivity to PAF in the case of wild types. During a subsequent stage in the project, the team will produce modified forms of PAF and analyse the effects they produce in *A. nidulans*. By also analysing the structure of the modified forms of the protein, the project team will be able to draw conclusions about which structural motifs of PAF are responsible for its effect in the target organism. On a molecular genetic level, Prof. Marx's team will identify the genes that are regulated by PAF.

RADICAL RESPONSE

The previous project has already enabled Prof. Marx and her team to clarify key questions regarding the effect of PAF. Prof. Marx explains: "A high dosage of PAF provokes apoptosis - programmed cell death - in the hyphae of sensitive fungi such as

A. nidulans. A dramatic succession of events that take place on a cellular level are primarily responsible for this. These include an increase in the electrical potential of the cell membrane, the activation of potassium channels and a rise in the concentration of cell-damaging free radicals. This latter event seems to be a key causative factor of cell death."

Prof. Marx's project meets the urgent need for the characterisation of new, effective fungicides. This need has increased dramatically over recent years as a result of the growing resistance to existing treatments exhibited by pathogenic fungi and, more significantly, due to major improvements in intensive care medicine. Such medical advances often weaken the immune system of patients, which enables fungal infections to take hold that would normally be easily fought off by the body's defences. By continuing to support the successful work of Prof. Marx and her team, the FWF is helping to lay the foundations for finding a solution to this medical problem.

Image and text will be available online from Monday, 17th March 2008, 09.00 a.m. CET onwards:

www.fwf.ac.at/en/public_relations/press/pv200803-en.html

Scientific Contact:

Prof. Florentine Marx

Innsbruck Medical University

Biozentrum

T +43 / 512 / 9003 - 70207

E florentine.marx@i-med.ac.at

Austrian Science Fund FWF:

Mag. Stefan Bernhardt

Haus der Forschung

Sensengasse 1

1090 Vienna

Austria

T +43 / 1 / 505 67 40 - 8111

E stefan.bernhardt@fwf.ac.at

Copy Editing & Distribution:

PR&D - Public Relations for Research & Education

Campus Vienna Biocenter 2

1030 Vienna

Austria

T +43 / 1 / 505 70 44

E contact@prd.at

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The Austrian Science Fund (FWF) is Austria's central body for the promotion of basic research. It is equally committed to all branches of science and in all its activities is guided solely by the standards of the international scientific community.

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