

Research Institute of Molecular Pathology

Dr. Bohr-Gasse 7, 1030 Vienna, Austria  
Tel: ++43-1-797 30/ext.  
Fax: ++43-1-798 71-56  
[www.imp.univie.ac.at](http://www.imp.univie.ac.at)

**September 15, 2005**

## **What Causes Psoriasis?**

**Scientists at the Research Institute of Molecular Pathology in Vienna have developed the first true animal model for psoriasis and have been able to address the initial steps and possible causes of the disease. The science journal NATURE publishes a coverstory in its September 15 issue.**

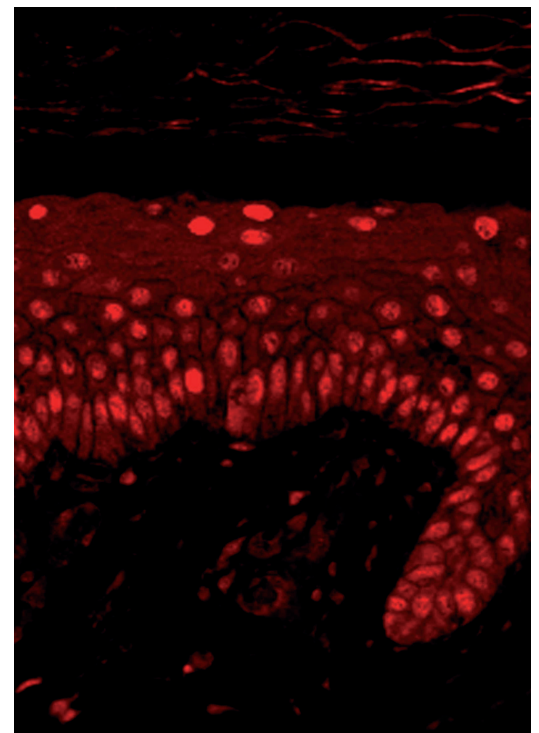
Psoriasis is a chronic disease of unsolved pathogenesis affecting between one and three percent of the general population. It is characterized by inflamed, scaly and frequently disfiguring skin lesions and often accompanied by arthritis of the small joints of the hands and feet.

The underlying causes of psoriasis are as yet unknown. It has been widely regarded as an autoimmune disease that affects the skin and the joints. Alternatively, it was characterized as a skin disorder with immunological consequences. Up to now, it was hard to get a clearer picture, mostly because the disease could not be reproduced and studied in animals.

Scientists at the Research Institute of Molecular Pathology (IMP), the basic research center of Boehringer Ingelheim in Vienna (Austria), have now been able to solve some of the puzzling aspects of the mystery. A team led by Senior Scientist Erwin F. Wagner was able to design a particularly useful strain of mice. The animals carry the disposition for psoriasis which can be activated on purpose at any time by a "genetic switch". Within two weeks following the trigger, the adult mice develop the hallmarks of psoriasis. Whereas previous models were only able to reproduce the skin lesions, the new strain also develops psoriatic arthritis. Due to the close resemblance of the clinical and histological picture of human psoriasis, the new disease-model is ideally suited to study in detail all aspects of pathogenesis.

The science journal NATURE publishes the research results in its current issue (September 15, 2005). The magazine also devotes the cover to the psoriasis-mice, hoping that they will solve the mystery about the cause of the disease. Author Rainer Zenz from the IMP is optimistic. "We strongly believe that this model will be highly suitable for future pre-clinical studies ultimately aimed at understanding and curing this widespread disease."

The work at the IMP was carried out in collaboration with researchers from the German Cancer Research Center in Heidelberg and with clinicians from the Medical University of Vienna. The first clues as to the genetic basis of psoriasis came from skin biopsies from the Department of Dermatology at Vienna's University hospital. In lesional skin of severe psoriasis, the IMP-scientists found greatly reduced activity of the JunB-gene. Human JunB belongs to a family of transcription factors and is known to regulate cell proliferation, differentiation and stress responses. However, mice lacking JunB do not show any signs of psoriasis. It is the combined deletion of JunB and c-Jun, a closely related gene, that brings forth the typical symptoms of the disease in mice. The disease-prone animals which were generated at the IMP carry a double mutation which can be induced by tamoxifen.



In healthy human skin, the activity of JunB is high (shown in red).  
In psoriatic lesions, the gene is considerably downregulated.

Copyright: Nature/IMP

### **Contact:**

Dr. Heidemarie Hurlt (Communications)  
+43 1 79730-358  
mobile: +43 664 8247910  
[hurlt@imp.univie.ac.at](mailto:hurlt@imp.univie.ac.at)

Prof. Erwin Wagner  
[wagner@imp.univie.ac.at](mailto:wagner@imp.univie.ac.at)

### **Links:**

[www.imp.univie.ac.at/wagner](http://www.imp.univie.ac.at/wagner)  
[www.boehringer-ingelheim.com](http://www.boehringer-ingelheim.com)  
[www.fwf.ac.at](http://www.fwf.ac.at)

# IMP Press Release

Further studies on the mutant mice already prove the model to be very powerful. Recent experiments could even shake some long-held beliefs: The IMP-researchers found that they could induce psoriasis even in mice lacking B- and T-cells, that is without a functioning immune system. This result contradicts the picture of an autoimmune disease mediated by T-cells as the initial event leading to the disease. Instead, current data support the hypothesis that epidermal alterations are sufficient to initiate both skin lesions and arthritis in psoriasis. Or, as Nature puts it, "outside-in" rather than "inside-out".

The work was supported by grants from the Austrian Science Fund FWF.

## **IMP**

The IMP is a basic research institute in Vienna, Austria. Its main sponsor is Boehringer Ingelheim International, headquartered in Germany. With over 200 employees from 28 different nations, the IMP is a Center of Excellence in the life sciences and the core unit of the Campus Vienna Biocenter. Research at the IMP aims at elucidating the molecular basis of normal development and disease.

## **IMP- IMBA Research Center**

The Research Institute of Molecular Pathology (IMP), established in 1988 by Boehringer Ingelheim, and the Institute of Molecular Biotechnology of the Austrian Academy of Sciences (IMBA), which went into operation in 2003, have agreed on a close research collaboration. Under the name "IMP-IMBA Research Center", the two institutes share most of the administrative and scientific infrastructure. Together, IMBA and IMP employ over 300 people from 30 different nations. Both institutes are members of the Campus Vienna Biocenter.

### Policy regarding use:

IMP press releases may be freely reprinted and distributed via print and electronic media. Text, photographs and graphics are copyrighted by the IMP. They may be freely reprinted and distributed in conjunction with this new story, provided that proper attribution to authors, photographers and designers is made. High-resolution copies of the images can be downloaded from the IMP web site: [www.imp.univie.ac.at](http://www.imp.univie.ac.at)