DSM Press Release

DSM, Corporate Communications
P.O. Box 6500, 6401 JH Heerlen, The Netherlands
Telephone (31) 45 5782421, Telefax (31) 45 5740680
Internet: www.dsm.com
E-mail: media.relations@dsm.com

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DSM publishes DNA sequence of *Aspergillus niger* genome in "Nature Biotechnology"

DSM is publishing a paper in the February 2007 issue of the renowned scientific journal "Nature Biotechnology" announcing the release of the DNA sequence of the fungus *Aspergillus niger*. The article – which has 69 co-authors – is the result of a research project carried out by DSM in which twenty-nine international research groups participated.

Rob van Leen, Chief Innovation Officer at DSM, commented: *"DSM realizes that the Aspergillus niger genome is of great interest to many other parties, both in industry and the academic world. DSM is releasing the DNA sequence to enable further research in this field. We are very pleased about this publication, which fits perfectly in our open-innovation policy. The Aspergillus niger research project is a foundation for our efforts in the area of 'white' or industrial biotechnology – and that area is an important part of the innovation boost in DSM's strategy* Vision 2010 – Building on Strengths*."*

Aspergillus niger is a micro-organism that DSM uses for the production of enzymes and other compounds, such as citric acid. These are mainly used in foodstuffs (bread, cheese, fruit juices, beer) to improve taste, shelf life, texture, nutritional value, etc. At the beginning of this century, DSM started work on the determination of the complete DNA sequence of *Aspergillus niger* and the identification of the functions of the different genes. The research grew into one of the most important industrial genomics projects in Europe, and earned DSM a position among Europe's leading biotechnology companies. The project has resulted in a high-quality genome sequence of 33.9 million base pairs with more than 14,000 unique genes. The (possible) functions of around 6500 of these genes could be established.

The genome sequencing forms part of a major genomics project. Dr Herman Pel, Principal Scientist Genomics and Bioinformatics at DSM who coordinated the execution of the sequencing project: "*The unraveling of the DNA sequence not only accelerates the development of new products, but also enables us to study the highly complex physiological behavior of* Aspergillus niger *with the help of the most advanced biological analysis techniques such as DNA micro-array analysis, proteomics and bio-informatics and use the insights gained to improve production processes."* Dr Hein Stam, Principal Scientist Applied Genomics and Fermentation who coordinated the publication of the genome: *"Further research on* Aspergillus niger *could help identify other possible uses of this micro-organism (such as in the sustainable use of raw materials). With the functions of some 7500 genes still unknown, scientific researchers have plenty of challenges to deal with in the future."*

The *Aspergillus niger* genome project has resulted in numerous patent filings by DSM and has laid the basis for a number of new DSM products such as PeptoPro® (ingredient for muscular recovery after physical exertion), Brewers Clarex™ (enzyme for preventing chill-haze in beers) and PreventASe™ (enzyme for preventing the formation of the toxic compound acrylamide during baking or frying of certain foodstuffs).

In addition, the project has resulted in a valuable scientific network. DSM's partners include Gene Alliance (a consortium of German companies involved in the sequence analysis); Biomax (annotation, bio-informatics; Germany); Affymetrix (DNA chips; USA); and the Micro Array Department (MAD) of the University of Amsterdam (analysis of the DNA arrays). Some of the research projects based on the genome were carried out as part of the research programs of consortia such as the Kluyver Centre for Genomics of Industrial Fermentation in Delft (Netherlands) and a number of sub-projects were carried out in collaboration with various universities, knowledge institutes and companies.

DSM
DSM is active worldwide in nutritional and pharma ingredients, performance materials and industrial chemicals. The company creates innovative products and services that help improve the quality of life. DSM's products are used in a wide range of end markets and applications such as human and animal nutrition and health, cosmetics, pharmaceuticals, automotive and transport, coatings, housing and electrics & electronics (E&E). DSM's strategy, named Vision 2010 – Building on Strengths, focuses on accelerating profitable and innovative growth of the company's specialties portfolio. Market-driven growth, innovation and increased presence in emerging economies are key drivers of this strategy. The group has annual sales of over EUR 8 billion and employs some 22,000 people worldwide. DSM ranks among the global leaders in many of its fields. The company is headquartered in the Netherlands, with locations in Europe, Asia, Africa and the Americas. More information on DSM can be found at www.dsm.com.

For further information:

DSM Corporate Communications
Nelleke Barning
tel. +31 (0) 45 5782017
fax +31 (0) 45 5740680
e-mail media.relations@dsm.com

DSM Investor Relations
Dries Ausems
tel. +31 (0) 45 5782864
fax +31 (0) 45 5782595
e-mail investor.relations@dsm.com

Forward-looking statements

This press release contains forward-looking statements. These statements are based on current expectations, estimates and projections of DSM management and information currently available to the company. The statements involve certain risks and uncertainties that are difficult to predict and therefore DSM does not guarantee that its expectations will be realized. Furthermore, DSM has no obligation to update the statements contained in this press release.