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Protein secretion and associated stress in industrially employed filamentous fungi

Reshma Jadhav^{1,2}, Robert L Mach¹, Astrid R Mach-Aigner^{1,2*}

¹Institute of Chemical, Environmental and Bioscience Engineering, TU Wien, Gumpendorfer Str. 1a, A-1060 Vienna, Austria

²Christian Doppler Laboratory for Optimized Expression of Carbohydrate-Active Enzymes, Institute of Chemical, Environmental and Bioscience Engineering, TU Wien, Gumpendorfer Str. 1a, A-1060 Vienna, Austria

*Corresponding author: Astrid Mach-Aigner, PhD

E-mail address: astrid.mach-aigner@tuwien.ac.at

Supplementary Table S1. Overview on the availability of information on protein secretion and ER stress mechanisms in industrially employed filamentous fungi for enzymes production. IA, information is available, information is not available.

Enzyme	Microorganism	Protein secretion	ER stress	Application
Acid proteinase	<i>Aspergillus</i> sp.	IA	INA	Milk coagulation
Aminopeptidase	<i>A. niger</i>	IA	INA	Synthesis of biopeptides and amino acids
	<i>A. oryzae</i>	INA	INA	
AMP deaminase	<i>A. melleus</i>	INA	INA	
Amylase	<i>A. niger</i>	INA	IA	Fibre splitting, carbohydrate stain removal, used in brewing and fermentation industries, and the laundry industry
	<i>A. oryzae</i>	IA	IA	
	<i>Lichtheimia ramosa</i>	INA	INA	
	<i>Thermoascus aurantiacus</i>	INA	INA	
	<i>Rhizopus oryzae</i>	INA	INA	
Arabinofuranosidase	<i>A. niger</i>	INA	INA	Clarification of fruit juices, digestion enhancement of animal feedstuffs and as a natural improver for bread
Catalase	<i>A. niger</i>	INA	INA	Improving the quality of cheese
Cellobiase	<i>A. niger</i>	IA	INA	Hydrolysis of cellobiose
	<i>T. reesei</i>	INA	INA	
Cellulases	<i>T. reesei</i>	IA	IA	Fruit liquefaction, hydrolysis of cellulose
	<i>T. atroviride</i>	IA	INA	
	<i>Penicillium funiculosum</i>	INA	INA	
	<i>A. niger</i>	INA	INA	
	<i>A. fumigatus</i>	INA	INA	
	<i>Sporotrichum thermophile</i>	INA	INA	
Dextranase	<i>Chaetomium erraticum</i>	INA	INA	Hydrolysis of dextran
Feedase	<i>Penicillium funiculosum</i>	INA	INA	Hydrolysis of the indigestible fraction of feed
Galactosidase	<i>A. niger</i>	INA	INA	Beet sugar refining, antitumor activity
Glucanase	<i>A. niger</i>	INA	INA	Hydrolysis of the barley gums in the brewing industry
	<i>T. reesei</i>	INA	INA	
	<i>Talaromyces emersonii</i>	INA	INA	
	<i>Humicola insolens</i>	INA	INA	

Glucose oxidase	<i>A. niger</i>	INA	INA	Dough strengthening, oxygen removal from beer
	<i>A. tubingensis</i>	INA	INA	
	<i>P. chrysogenum</i>	INA	INA	
	<i>Penicillium purpurgenum</i>	INA	INA	
	<i>P. INAtatum</i>	INA	INA	
Glucosidase	<i>Myceliophthora heterothalica</i>	INA	INA	Metabolism of glycolipids and dietary glucosides, and signaling functions
	<i>Gongronella butleri</i>	INA	INA	
	<i>F. oxysporum</i>	INA	INA	
	<i>Penicillium sp. LMI01</i>	INA	INA	
Hemicellulase	<i>A. niger</i>	INA	INA	Modification of the structure of xylan and glucomannan in pulp fibers in order to enhance the chemical delignification
	<i>Trichoderma sp.</i>	IA	IA	
	<i>Humicola sp.</i>	INA	INA	
Invertase	<i>A. flavus</i>	INA	INA	Soft-centered candies, artificial honeys, confectioneries, liqueurs
	<i>A. caespitosus</i>	INA	INA	
	<i>Cladosporium herbarum</i>	INA	INA	
Chitinase	<i>T. viride</i>	INA	INA	Breakdown of chitin
	<i>P. chrysogenum</i>	INA	INA	
	<i>T. koningiopsis</i>	INA	INA	
Laccase	<i>Trametes versicolor</i>	INA	IA	Biodegradation, oligomerization of proteins and sugar derivatives, polymerization to form functional polymers
	<i>Trametes villosa</i>	INA	INA	
	<i>Trametes hirsuta</i>	INA	INA	
	<i>Trametes pubescens</i>	INA	INA	
	<i>P. chrysogenum</i>	INA	INA	
	<i>Ganoderma lucidum</i>	INA	INA	
	<i>A. fumigatus</i>	INA	INA	
L-asparaginase	<i>A. niger</i> <i>A. terreus</i> <i>P. digitatum</i> <i>F. equiseti</i> <i>Emericella nidulans</i>	INA INA INA INA INA	INA INA INA INA INA	Hydrolyzes L-asparagine to L-aspartic acid and ammonia, applied in pharmaceutical and food industries
Ligininase	<i>A. niger</i> <i>P. ostreatus</i> <i>Xylaria sp.</i>	INA INA INA	INA INA INA	Degrade a wide variety of structurally diverse organic compounds, including a

				number of environmentally persistent organic pollutants
Lipase	<i>Trichoderma</i> sp. <i>Penicillium</i> sp. <i>A. niger</i>	INA INA INA	INA INA	Cheese ripening, flavored cheese, Fat stain removal, degreasing
Lysophospholipase	<i>A. niger</i>	INA	INA	Processing of starch for glucose syrups production, and for degumming of fats and oils
Naringinase	<i>A. niger</i> <i>A. oryzae</i> <i>A. usamii</i> <i>Rhizopus nigricans</i>	INA INA INA INA	INA INA INA INA	Debittering in beverage industry
Pectinase	<i>A. niger</i> <i>P. funiculosum</i> <i>P. oxalicum</i>	INA INA INA	INA INA INA	Depectinization
Peroxidase	<i>Mushroom</i> <i>Coprinus</i>			
Protease	<i>A. melleus</i> <i>A. oryzae</i> <i>A. niger</i> <i>A. flavus</i> <i>A. flavipes</i> <i>A. brasiliensis</i> <i>Penicillium citrinum</i> <i>Rhizomucor miehei</i>	INA INA INA INA INA INA INA INA	INA INA INA INA INA INA INA INA	Protein stain removal, restrict haze formation, to improve the aroma of bread, dehairing, soaking
Ribonuclease	<i>Penicillium citrinum</i>	INA	INA	Catalyzes degradation of RNA
Tannase	<i>A. oryzae</i>	INA	INA	Preparation of instantaneouse tea, action on tea polyphenols, production of gallic acid, beer chillproofing and wine making
Xylanase	<i>T. reesei</i> <i>T. longibrachiatum</i> <i>Humicola insolens</i> <i>A. niger</i> <i>Rhizopus oryzae</i> <i>A. fumigatus</i>	INA INA INA INA INA INA	INA INA INA INA INA INA	Dough conditioning