

Publications

Goldmann M^{*}, Schmidt F^{*}, Cseresnyés Z, Orasch T, Jahreis S, Hartung S, Figge MT, von Lilienfeld-Toal M, Heinekamp T, Brakhage AA[#] (2023) The lipid raft-associated protein stomatin is required for accumulation of dectin-1 in the phagosomal membrane and for full activity of macrophages against *Aspergillus fumigatus*. *mSphere* 8(1), e00523-22.

González K^{*}, Gangapurwala G^{*}, Alex J^{*}, Vollrath A, Cseresnyés Z, Weber C, Czaplewska JA, Hoeppener S, Svensson CM, Orasch T, Heinekamp T, Guerrero-Sánchez C, Figge MT, Schubert US, Brakhage AA (2023) Targeting of phagolysosomes containing conidia of the human pathogenic fungus *Aspergillus fumigatus* with polymeric particles. *Appl Microbiol Biotechnol* 107(2-3), 819-834.

Jia LJ, Rafiq M, Radosa L, Hortschansky P, Cunha C, Cseresnyés Z, Krüger T, Schmidt F, Heinekamp T, Straßburger M, Loeffler B, Doenst T, Lacerda JF, Campos A, Figge MT, Carvalho A, Kniemeyer O, Brakhage AA[#] (2023) *Aspergillus fumigatus* hijacks human p11 to redirect fungal-containing phagosomes to non-degradative pathway. *Cell Host Microbe* 31(3), 373-388.e10.

König S, Schroeder J, Nietzsche S, Heinekamp T, Brakhage AA, Zell R, Löffler B, Ehrhardt C (2023) The influenza A virus promotes fungal growth of *Aspergillus fumigatus* via direct interaction *in vitro*. *Microbes Infect* 26(3), 105264.

Mirhakkak MH^{*}, Chen X^{*}, Heinekamp T, Sae-Ong T, Xu LL, Ni Y, Kurzai O, Barber AE, Brakhage AA, Boutin S, Schäuble S[#], Panagiotou G[#] (2023) Genome-scale Metabolic modeling of *Aspergillus fumigatus* strains reveals growth dependencies on the lung microbiome. *Nat Commun* 14(1), 4369.

Balkenhol J, Bencurova E, Gupta SK, Schmidt H, Heinekamp T, Brakhage AA, Pottikkadavath A, Dandekar T (2022) Prediction and validation of host-pathogen interactions by a versatile inference approach using *Aspergillus fumigatus* as a case study. *Comput Struct Biotechnol J* 20, 4225-4237.

Schmidt F, Heinekamp T, Brakhage AA (2022) Lebensbedrohliche Pilzinfektionen - Unterschätzte Gefahr durch pilzliche Krankheitserreger. *BiuZ* 52(3), 268-277. (Review)

Xu R, Lou Y, Tidu A, Bulet P, Heinekamp T, Martin F, Brakhage A, Li Z, Liégeois S, Ferrandon D (2022) The toll pathway mediates *Drosophila* resilience to *Aspergillus* mycotoxins through specific bomanins. *EMBO Rep* 24(1), e56036.

Brantl V, Boysen JM, Yap A, Golubtsov E, Ruf D, Heinekamp T, Straßburger M, Dichtl K, Haas H, Hillmann F, Wagener J (2021) Peroxiredoxin Asp f3 is essential for *Aspergillus fumigatus* to overcome iron limitation during infection. *mBio* 12(4), e0097621.

Scharf DH, Chankhamjon P, Scherlach K, Dworschak J, Heinekamp T, Roth M, Brakhage AA, Hertweck C (2021) N-heterocyclization in gliotoxin biosynthesis is catalyzed by a distinct cytochrome P450 monooxygenase. *Chembiochem* 22(2), 336-339.

Strømmand Ø, Kallio JP, Pschibul A, Skoge RH, Harðardóttir HM, Sverkeli LJ, Heinekamp T, Kniemeyer O, Migaud M, Makarov MV, Gossmann TI, Brakhage AA, Ziegler M (2021) Discovery of fungal surface NADases predominantly present in pathogenic species. *Nat Commun* 12(1), 1631.

Valente S, Piombo E, Schroeckh V, Meloni GR, Heinekamp T, Brakhage AA, Spadaro D (2021) CRISPR-Cas9-based discovery of the verrucosidin biosynthesis gene cluster in *Penicillium polonicum*. *Front Microbiol* 12, 660871.

Yu Y, Wolf AK, Thusek S, Heinekamp T, Bromley M, Krappmann S, Terpitz U, Voigt K, Brakhage AA, Beilhack A (2021) Direct visualization of fungal burden in filamentous fungus-infected silkworms. *J Fungi (Basel)* 7(2), 136.

Alex J, Gonzalez K, Kindel T, Bellstedt P, Weber C, Heinekamp T, Orasch T, Guerrero-Sanchez C, Schubert US, Brakhage AA (2020) Caspofungin functionalized polymethacrylates with antifungal properties. *Biomacromolecules* 21(6), 2104-2115.

Frawley D, Stroe MC, Oakley BR, Heinekamp T, Straßburger M, Fleming AB, Brakhage AA, Bayram Ö (2020) The pheromone module SteC-MkkB-MpkB-SteD-HamE regulates development, stress responses and secondary metabolism in *Aspergillus fumigatus*. *Front Microbiol* 11, 811.

Schmidt F, Thywißen A, Goldmann M, Cunha C, Cseresnyés Z, Schmidt H, Rafiq M, Galiani S, Gräler MH, Chamilos G, Lacerda JF, Campos Jr A, Eggeling C, Figge MT, Heinekamp T, Filler SG, Carvalho A, Brakhage AA (2020) Flotillin-dependent lipid-raft microdomains are required for functional phagolysosomes against fungal infections. *Cell Rep* 32(7), 108017.

Zukovskaja O, Ryabchykov O, Straßburger M, Heinekamp T, Brakhage AA, Hennings CJ, Hübner CA, Wegmann M, Cialla-May D, Bocklitz TW, Weber K, Popp J (2020) Towards Raman spectroscopy of urine as screening tool. *J Biophotonics* 13(1), e201900143.

König S, Pace S, Pein H, Heinekamp T, Kramer J, Romp E, Straßburger M, Troisi F, Proschak A, Dworschak J, Scherlach K, Rossi A, Sautebin L, Haeggström JZ, Hertweck C, Brakhage AA, Gerstmeier J, Proschak E, Werz O (2019) Gliotoxin from *Aspergillus fumigatus* abrogates leukotriene B4 formation through inhibition of leukotriene A4 hydrolase. *Cell Chem Biol* 26(4), 524-534.

Manfiolli AO, Siqueira FS, Dos Reis TF, Van Dijck P, Schrevens S, Hoefgen S, Föge M, Straßburger M, de Assis LJ, Heinekamp T, Rocha MC, Janevska S, Brakhage AA, Malavazi I, Goldman GH, Valiante V (2019) Mitogen-activated protein kinase cross-talk interaction modulates the production of melanins in *Aspergillus fumigatus*. *mBio* 10(2), e00215-19.

Zhao C, Fraczek M, Dineen L, Lebedinec R, Macheleidt J, Heinekamp T, Delneri D, Bowyer P, Brakhage AA, Bromley M (2019) High throughput gene replacement in *Aspergillus fumigatus*. *Curr Protoc Microbiol* 54(1), e88.

Bakti F, Sasse C, Heinekamp T, Pócsi I, Braus GH (2018) Heavy metal-induced expression of PcaA provides cadmium tolerance to *Aspergillus fumigatus* and supports its virulence in the *Galleria mellonella* model. *Front Microbiol* 9, 744.

Long N, Orasch T, Zhang S, Gao L, Xu X, Hortschansky P, Ye J, Zhang F, Xu K, Gsaller F, Straßburger M, Binder U, Heinekamp T, Brakhage AA, Haas H, Lu L (2018) The Zn2Cys6-type transcription factor LeuB cross-links regulation of leucine biosynthesis and iron acquisition in *Aspergillus fumigatus*. *PLOS Genet* 14(10), e1007762.

Scharf DH, Dworschak JD, Chankhamjon P, Scherlach K, Heinekamp T, Brakhage AA, Hertweck C (2018) Reconstitution of enzymatic carbon-sulfur bond formation reveals detoxification-like strategy in fungal toxin biosynthesis. *ACS Chem Biol* 13(9), 2508-2512.

Schmidt H, Vlaic S, Krüger T, Schmidt F, Balkenhohl J, Dandekar T, Guthke R, Kniemeyer O, Heinekamp T, Brakhage AA (2018) Proteomics of *Aspergillus fumigatus* conidia-containing phagolysosomes identifies processes governing immune evasion. *Mol Cell Proteomics* 17(6), 1084-1096.

Voltersen V, Blango MG, Herrmann S, Schmidt F, Heinekamp T, Strassburger M, Krüger T, Bacher P, Lothar J, Weiss E, Hünninger K, Liu H, Hortschansky P, Scheffold A, Loeffler J, Krappmann S, Nietzsche S, Kurzai O, Einsele H, Kniemeyer O, Filler S, Reichard U, Brakhage AA (2018) Proteome analysis reveals the conidial surface protein CcpA essential for virulence of the pathogenic fungus *Aspergillus fumigatus*. *mBio* 9(5), e01557-18.

Johns A†, Scharf DH†, Gsaller F, Schmidt H, Heinekamp T, Straßburger M, Oliver JD, Birch M, Beckmann N, Dobb KS, Gilsenan J, Rash B, Bignell E, Brakhage AA*, Bromley MJ* †shared first authors, *corresponding authors (2017) A nonredundant phosphopantetheinyl transferase, PptA, is a novel antifungal target that directs secondary metabolite, siderophore, and lysine biosynthesis in *Aspergillus fumigatus* and is critical for pathogenicity. *MBio* 8(4), e01504-e01516.

Hillmann F, Bagramyan K, Straßburger M, Heinekamp T, Hong TB, Bzymek KP, Williams JC, Brakhage AA, Kalkum M (2016) The crystal structure of peroxiredoxin Asp f3 provides mechanistic insight into oxidative stress resistance and virulence of *Aspergillus fumigatus*. *Sci Rep* 6, 33396.

Joehnk B, Bayram O, Valerius O, Heinekamp T, Jacobsen ID, Mattern D, Brakhage AA, Braus G (2016) SCF Ubiquitin Ligase F-box Protein Fbx15 Controls Nuclear Co-repressor Localization, Stress Response and Virulence of the Human Pathogen *Aspergillus fumigatus* *PLOS Pathog* 12(9), e1005899.

Kalb D, Heinekamp T, Schieferdecker S, Nett M, Brakhage AA, Hoffmeister D (2016) An Iterative O-Methyltransferase Catalyzes 1,11-Dimethylation of *Aspergillus fumigatus* Fumaric Acid Amides. *ChemBioChem* 17, 1813-1817.

Kroll K, Shekhova E, Mattern DJ, Thywissen A, Jacobsen ID, Strassburger M, Heinekamp T, Shelest E, Brakhage AA, Kniemeyer O (2016) The hypoxia-induced dehydrogenase HorA is required for coenzyme Q10 biosynthesis, azole sensitivity and virulence of *Aspergillus fumigatus* *Mol Microbiol* 101(1), 92-108.

Valiante V, Baldin C, Hortschansky P, Jain R, Thywißen A, Straßburger M, Shelest E, Heinekamp T, Brakhage AA (2016) The *Aspergillus fumigatus* conidial melanin production is regulated by the bifunctional bHLH DevR and MADS-box RlmA transcription factors. *Mol Microbiol* 102(2), 321-335.

Heinekamp T, Schmidt H, Lapp K, Pätz V, Shopova I, Köster-Eiserfunke N, Krüger T, Kniemeyer O, Brakhage AA (2015) Interference of *Aspergillus fumigatus* with the immune response. *Semin Immunopathol* 37(2), 141-152. (Review)

Hillmann F, Novohradská S, Mattern DJ, Forberger T, Heinekamp T, Westermann M, Winckler T, Brakhage AA (2015) Virulence determinants of the human pathogenic fungus *Aspergillus fumigatus* protect against soil amoeba predation. *Environ Microbiol* 17(8), 2858-2869.

Kalb D, Heinekamp T, Lackner G, Scharf DH, Dahse HM, Brakhage AA, Hoffmeister D (2015) Genetic engineering activates biosynthesis of aromatic fumaric acid amides in the human pathogen *Aspergillus fumigatus*. *Appl Environ Microbiol* 81, 1594-1600.

Lin CJ, Sasse C, Gerke J, Valerius O, Irmer H, Frauendorf H, Heinekamp T, Straßburger M, Tran VT, Herzog B, Braus-Stromeyer SA, Braus GH (2015) Transcription Factor SomA Is Required for Adhesion, Development and Virulence of the Human Pathogen *Aspergillus fumigatus* *PLOS Pathogens* 11(11), e1005205.

Macheleidt J, Scherlach K, Neuwirth T, Schmidt-Heck W, Straßburger M, Spraker J, Baccile JA, Schroeder FC, Keller NP, Hertweck C, Heinekamp T, Brakhage AA (2015) Transcriptome analysis of cAMP-dependent protein kinase A regulated genes reveals the production of the novel natural compound fumipyrrole by *Aspergillus fumigatus* *Mol Microbiol* 96(1), 148-162.

Rambach G, Blum G, Latgé JP, Fontaine T, Heinekamp T, Hagleitner M, Jeckström H, Weigel G, Würtinger P, Pfaller K, Krappmann S, Löffler J, Lass-Flörl C, Speth C (2015) Identification of *Aspergillus fumigatus* surface components that mediate interaction of conidia and hyphae with human platelets. *J Infect Dis* 212(7), 1140-1149.

Wlaź P, Knaga S, Kasperek K, Wlaź A, Poleszak E, Jeżewska-Witkowska G, Winiarczyk S, Wyska E, Heinekamp T, Rundfeldt C (2015) Activity and Safety of Inhaled Itraconazole Nanosuspension in a Model Pulmonary *Aspergillus fumigatus* Infection in Inoculated Young Quails. *Mycopathologia* 180(1-2), 35-42.

Heinekamp T, Valiante V, Koester-Eiserfunke N, Brakhage AA (2014) Functional genomics to characterize opportunistic pathogens. In: Nowrousian M (ed.) *The Mycota* 13, pp. 321-347. Springer. ISBN: 9783642452178.

Hillmann F, Linde J, Beckmann N, Cyrulies M, Strassburger M, Heinekamp T, Haas H, Guthke R, Kniemeyer O, Brakhage AA (2014) The novel globin protein fungoglobulin is involved in low oxygen adaptation of *Aspergillus fumigatus*. *Mol Microbiol* 93(3), 539-553.

Lapp K, Vödisch M, Kroll K, Strassburger M, Kniemeyer O, Heinekamp T, Brakhage AA (2014) Characterisation of the *Aspergillus fumigatus* detoxification systems for reactive nitrogen intermediates and impact on virulence. *Frontiers in Microbiology* 5, 469.

Scharf DH, Groll M, Habel A, Heinekamp T, Hertweck C, Brakhage AA, Huber EM (2014) Flavoenzyme-catalyzed formation of disulfide bonds in natural products. *Angew Chem Int Ed* 53(8), 2221-2224.

Scharf DH, Habel A, Heinekamp T, Brakhage AA, Hertweck C (2014) Opposed effects of enzymatic gliotoxin N- and S-methylations. *J Am Chem Soc* 136(33), 11674-11679.

Scharf DH, Heinekamp T, Brakhage AA (2014) Human and plant fungal pathogens: the role of secondary metabolites. *PLOS Pathog* 10(1), e1003859. (Review)

Scharf DH, Chankhamjon P, Scherlach K, Heinekamp T, Willing K, Brakhage AA, Hertweck C (2013) Epidithiodiketopiperazine biosynthesis: A four-enzyme cascade converts glutathione conjugates into transannular disulfide bridges. *Angew Chem Int Ed* 52(42), 11092-11095.

Heinekamp T, Thywißen A, Macheleidt J, Keller S, Valiante V, Brakhage AA (2012) *Aspergillus fumigatus* melanins: interference with the host endocytosis pathway and impact on virulence. *Front Microbiol* 3, 440.

Horn F, Heinekamp T, Kniemeyer O, Pollmächer J, Valiante V, Brakhage AA (2012) Systems biology of fungal infection. *Front Microbiol* 3, 108.

Scharf DH, Chankhamjon P, Scherlach K, Heinekamp T, Roth M, Brakhage AA, Hertweck C (2012) Epithiol formation by an unprecedented twin carbon-sulfur lyase in the gliotoxin pathway. *Angew Chem Int Ed* 51(40), 10064-10068.

Scharf DH, Heinekamp T, Remme N, Hortschansky P, Brakhage AA, Hertweck C (2012) Biosynthesis and function of gliotoxin in *Aspergillus fumigatus*. *Appl Microbiol Biotechnol* 93(2), 467-472.

Jain R, Valiante V, Remme N, Docimo T, Heinekamp T, Hertweck C, Gershenzon J, Haas H, Brakhage AA (2011) The MAP kinase MpkA controls cell wall integrity, oxidative stress response, gliotoxin production and iron adaptation in *Aspergillus fumigatus*. *Mol Microbiol* 82(1), 39-53.

Keller S, Macheleidt J, Scherlach K, Schmalzer-Ripcke J, Jacobsen ID, Heinekamp T, Brakhage AA (2011) Pyomelanin formation in *Aspergillus fumigatus* requires HmgX and the transcriptional activator HmgR but is dispensable for virulence. *PLOS One* 6(10), e26604.

Scharf DH, Remme N, Habel A, Chankhamjon P, Scherlach K, Heinekamp T, Hortschansky P, Brakhage AA, Hertweck C (2011) A dedicated glutathione S-transferase mediates carbon-sulfur bond formation in gliotoxin biosynthesis. *J Am Chem Soc* 133(32), 12322-12325.

Thywißen A, Heinekamp T, Dahse HM, Schmalzer-Ripcke J, Nietzsche S, Zipfel PF, Brakhage AA (2011) Conidial dihydroxynaphthalene melanin of the human pathogenic fungus *Aspergillus fumigatus* interferes with the host endocytosis pathway. *Front Microbiol / Fungi and their interactions* 2, 96.

Wartenberg D, Lapp K, Jacobsen ID, Dahse HM, Kniemeyer O, Heinekamp T, Brakhage AA (2011) Secretome analysis of *Aspergillus fumigatus* reveals Asp-hemolysin as a major secreted protein. *Int J Med Microbiol* 301(7), 602-611.

Bruns S, Kniemeyer O, Hasenberg M, Aimaganianda V, Nietzsche S, Thywissen A, Jeron A, Latgé JP, Brakhage AA, Gunzer M (2010) Production of extracellular traps against *Aspergillus fumigatus* *in vitro* and in infected lung tissue is dependent on invading neutrophils and influenced by hydrophobin RodA. *PLOS Pathog* 6(4), e1000873.

Gehrke A, Heinekamp T, Jacobsen ID, Brakhage AA (2010) Heptahelical receptors GprC and GprD of *Aspergillus fumigatus* are essential regulators of colony growth, hyphal morphogenesis, and virulence. *Appl Environ Microbiol* 76(12), 3989-3998.

Scharf DH, Remme N, Heinekamp T, Hortschansky P, Brakhage AA, Hertweck C (2010) Transannular disulfide formation in gliotoxin biosynthesis and its role in self-resistance of the human pathogen *Aspergillus fumigatus*. *J Am Chem Soc* 132(29), 10136-10141.

Schrettl M, Beckmann N, Varga J, Heinekamp T, Jacobsen ID, Jöchl C, Moussa TA, Wang S, Gsaller F, Blatzer M, Werner ER, Niermann WC, Brakhage AA, Haas H (2010) HapX-mediated adaption to iron starvation is crucial for virulence of *Aspergillus fumigatus*. *PLOS Pathog* 6(9), e1001124-e1001124.

Schmalzer-Ripcke J, Sugareva V, Gebhardt P, Winkler R, Kniemeyer O, Heinekamp T, Brakhage AA (2009) Production of pyomelanin, a second type of melanin, via the tyrosine degradation pathway in *Aspergillus fumigatus*. *Appl Environ Microbiol* 75(2), 493-503.

Valiante V, Jain R, Heinekamp T, Brakhage AA (2009) The MpkA MAP kinase module regulates

cell wall integrity signaling and pyomelanin formation in *Aspergillus fumigatus*. *Fungal Genet Biol* 46(12), 909-918.

Grosse C, Heinekamp T, Kniemeyer O, Gehrke A, Brakhage AA (2008) Protein kinase A regulates growth, sporulation, and pigment formation in *Aspergillus fumigatus*. *Appl Environ Microbiol* 74(15), 4923-4933.

Mota Júnior AO, Malavazi I, Soriani FM, Heinekamp T, Jacobsen I, Brakhage AA, Savoldi M, Goldman MH, da Silva Ferreira ME, Goldman GH (2008) Molecular characterization of the *Aspergillus fumigatus* NCS-1 homologue, NcsA. *Mol Genet Genomics* 280(6), 483-495.

Schrettl M, Kim HS, Eisendle M, Kragl C, Nierman WC, Heinekamp T, Werner ER, Jacobsen I, Illmer P, Yi H, Brakhage AA, Haas H (2008) SreA-mediated iron regulation in *Aspergillus fumigatus*. *Mol Microbiol* 70(1), 27-43.

Valiante V, Heinekamp T, Jain R, Härtl A, Brakhage AA (2008) The mitogen-activated protein kinase MpkA of *Aspergillus fumigatus* regulates cell wall signaling and oxidative stress response. *Fungal Genet Biol* 45(5), 618-627.

da Silva Ferreira ME, Heinekamp T, Härtl A, Brakhage AA, Semighini CP, Harris SD, Savoldi M, de Gouvêa PF, de Souza Goldman MH, Goldman GH (2007) Functional characterization of the *Aspergillus fumigatus* calcineurin. *Fungal Genet Biol* 44(3), 219-230.

da Silva Ferreira ME, Kress MR, Savoldi M, Goldman MH, Härtl A, Heinekamp T, Brakhage AA, Goldman GH (2006) The akuB(KU80) mutant deficient for nonhomologous end joining is a powerful tool for analyzing pathogenicity in *Aspergillus fumigatus*. *Eukaryot Cell* 5(1), 207-211.

Kupfahl C, Heinekamp T, Geginat G, Ruppert T, Härtl A, Hof H, Brakhage AA (2006) Deletion of the gliP gene of *Aspergillus fumigatus* results in loss of gliotoxin production but has no effect on virulence of the fungus in a low-dose mouse infection model. *Mol Microbiol* 62(1), 292-302.

Sugareva V, Härtl A, Brock M, Hübner K, Rohde M, Heinekamp T, Brakhage AA (2006) Characterisation of the laccase-encoding gene abr2 of the dihydroxynaphthalene-like melanin gene cluster of *Aspergillus fumigatus*. *Arch Microbiol* 186(5), 345-355.

*equal contribution #corresponding author