

# Publications

Böttcher B, Kienast SD, Leufken J, Eggers C, Sharma P, Leufken CM, Morgner B, Drexler HCA, Schulz D, Allert S, Jacobsen ID, Vylkova S, Leidel SA, Brunke S<sup>#</sup> (2024) A highly conserved tRNA modification contributes to *C. albicans* filamentation and virulence. *Microbiol Spectr* [Epub ahead of print]

Sekeresova Kralova J, Donic C, Dassa B, Livyatan I, Jansen PM, Ben-Dor S, Fidel L, Trzebanski S, Narunsky-Haziza L, Asraf O, Brenner O, Dafni H, Jona G, Boura-Halfon S, Stettner N, Segal E, Brunke S, Pilpel Y, Straussman R, Zeevi D, Bacher P, Hube B, Shlezinger N, Jung S (2024) Competitive fungal commensalism mitigates candidiasis pathology. *J Exp Med* 221(5), e20231686.

Alings F, Scharmann K, Eggers C, Böttcher B, Sokołowski M, Shvetsova E, Sharma P, Roth J, Rashiti L, Glatt S, Brunke S, Leidel SA (2023) Ncs2\* mediates *in vivo* virulence of pathogenic yeast through sulphur modification of cytoplasmic transfer RNA. *Nucleic Acids Res* 51(15), 8133-8149.

Götze S, Vij R, Burow K, Thome N, Urbat L, Schlosser N, Pflanze S, Müller R, Hänsch VG, Schlabach K, Fazlikhani L, Walther G, Dahse HM, Regestein L, Brunke S, Hube B, Hertweck C, Franken P, Stallforth P (2023) Ecological niche-inspired genome mining leads to the discovery of crop-protecting nonribosomal lipopeptides featuring a transient amino acid building block. *J Am Chem Soc* 145(4), 2342-2353.

Lange T, Kasper L, Gresnigt MS, Brunke S, Hube B (2023) "Under Pressure" - How fungi evade, exploit, and modulate cells of the innate immune system. *Semin Immunol* 66, 101738. (Review)

Martini GR, Tikhonova E, Rosati E, DeCelie MB, Sievers LK, Tran F, Lessing M, Bergfeld A, Hinz S, Nikolaus S, Kümpers J, Matysiak A, Hofmann P, Saggau C, Schneiders S, Kamps AK, Jacobs G, Lieb W, Maul J, Siegmund B, Seegers B, Hinrichsen H, Oberg HH, Wesch D, Bereswill S, Heimesaat MM, Rupp J, Kniemeyer O, Brakhage AA, Brunke S, Hube B, Aden K, Franke A, Iliev ID, Scheffold A, Schreiber S, Bacher P (2023) Selection of cross-reactive T cells by commensal and food-derived yeasts drives cytotoxic TH1 cell responses in Crohn's disease. *Nat Med* 29(10), 2602-2614.

Schwarz C, Eschenhagen P, Schmidt H, Hohnstein T, Iwert C, Grehn C, Roehmel J, Steinke E, Stahl M, Lozza L, Tikhonova E, Rosati E, Stervbo U, Babel N, Mainz JG, Wisplinghoff H, Ebel F, Jia LJ, Blango MG, Hortschansky P, Brunke S, Hube B, Brakhage AA, Kniemeyer O, Scheffold A, Bacher P (2023) Antigen specificity and cross-reactivity drive functionally diverse anti-*Aspergillus fumigatus* T cell responses in cystic fibrosis. *J Clin Invest* 133(5), e161593.

Seelbinder B<sup>#</sup>, Lohinai Z<sup>\*</sup>, Vazquez-Uribe R, Brunke S, Chen X, Mirhakkak M, Lopez-Escalera S, Dome B, Megyesfalvi Z, Berta J, Galffy G, Dulka E, Wellejus A, Weiss GJ, Bauer M, Hube B, Sommer MOA, Panagiotou G (2023) *Candida* expansion in the gut of lung cancer patients associates with an ecological signature that supports growth under dysbiotic conditions. *Nat Commun* 14(1), 2673.

Sonnberger J, Kasper L, Lange T, Brunke S, Hube B (2023) "We've got to get out"-Strategies of human pathogenic fungi to escape from phagocytes. *Mol Microbiol* 121(3), 341-358. (Review)

Allert S, Schulz D, Kämmer P, Großmann P, Wolf T, Schäuble S, Panagiotou G, Brunke S, Hube

B (2022) From environmental adaptation to host survival: Attributes that mediate pathogenicity of *Candida auris*. *Virulence* 13(1), 191-214.

Gómez AC, Lyons T, Mamat U, Yero D, Bravo M, Daura X, Elshafee O, Brunke S, Gahan CGM, O'Driscoll M, Gibert I, O'Sullivan TP (2022) Synthesis and evaluation of novel furanones as biofilm inhibitors in opportunistic human pathogens. *Eur J Med Chem* 242, 114678.

Mogavero S, Höfs S, Lauer AN, Müller R, Brunke S, Allert S, Gerwien F, Groth S, Dolk E, Wilson D, Gutsmann T, Hube B (2022) Candidalysin is the hemolytic factor of *Candida albicans*. *Toxins (Basel)* 14(12), 874.

Siscar-Lewin S, Hube B, Brunke S (2022) Emergence and evolution of virulence in human pathogenic fungi. *Trends Microbiol* 30(7), 693-704. (Review)

Graf K, Hube B, Brunke S (2021) Experimental evolution of *Candida* by serial passaging in host cells. *Methods Mol Biol* 2260, 145-154.

Mirhakkak M, Schäuble S, Klassert T, Brunke S, Brandt P, Loos D, Uribe R, de Oliveira Lino FS, Ni Y, Vylkova S, Slevogt H, Hube B, Weiss G, Sommer M, Panagiotou G<sup>#</sup> (2021) Metabolic modeling predicts specific gut bacteria as key determinants for *Candida albicans* colonization levels. *ISME J* 15(5), 1257-1270.

Mogavero S, Sauer FM, Brunke S, Allert S, Schulz D, Wisgott S, Jablonowski N, Elshafee O, Krüger T, Kniemeyer O, Brakhage AA, Naglik JR, Dolk E, Hube B (2021) Candidalysin delivery to the invasion pocket is critical for host epithelial damage induced by *Candida albicans*. *Cell Microbiol* 23(10), e13378.

Pekmezovic M, Hovhannisyan H, Gresnigt MS, Iracane E, Oliveira-Pacheco J, Siscar-Lewin S, Seemann E, Qualmann B, Kalkreuter T, Müller S, Kamradt T, Mogavero S, Brunke S, Butler G, Gabaldón T, Hube B (2021) *Candida* pathogens induce protective mitochondria-associated type I interferon signalling and a damage-driven response in vaginal epithelial cells. *Nat Microbiol* 6(5), 643-657.

Schaefer S, Pham TTP, Brunke S, Hube B, Jung K, Lenardon MD, Boyer C (2021) Rational design of an antifungal polyacrylamide library with reduced host-cell toxicity. *ACS Appl Mater Interfaces* 13(23), 27430-27444.

Siscar-Lewin S, Gabaldón T, Aldejohann AM, Kurzai O, Hube B, Brunke S (2021) Transient mitochondria dysfunction confers fungal cross-resistance against phagocytic killing and fluconazole. *mBio* 12(3), e0112821.

Sprenger M, Brunke S, Hube B, Kasper L (2021) A TRP1-marker-based system for gene complementation, overexpression, reporter gene expression, and gene modification in *Candida glabrata*. *FEMS Yeast Res* 20(8), foaa066.

Van Ende M, Timmermans B, Vanreppelen G, Siscar-Lewin S, Fischer D, Wijnants S, Romero CL, Yazdani S, Rogiers O, Demuyser L, Van Zeebroeck G, Cen Y, Kuchler K, Brunke S, Van Dijck P (2021) The involvement of the *Candida glabrata* trehalase enzymes in stress resistance and gut colonization. *Virulence* 12(1), 329-345.

Vij R, Hube B, Brunke S (2021) Uncharted territories in the discovery of antifungal and antivirulence natural products from bacteria. *Comput Struct Biotechnol J* 19, 1244-1252.

(Review)

Commichau FM, Anstatt J, Krappmann S, Stegmann E, Banhart S, Papenfort K, Brunke S, Hube B, Bramkamp M, Herbert M, Sander J, Mueller JW, Wagner M, Daus ML (2020) Wetträsten zwischen Pilz und Wirt. *BIOspektrum* 26(3), 280-286. (Review)

Kämmer P, McNamara S\*, Wolf T, Conrad T, Allert S, Gerwien F, Hünniger K, Kurzai O, Guthke R, Hube B, Linde J, Brunke S (2020) Survival strategies of pathogenic *Candida* species in human blood show independent and specific adaptations. *mBio* 11(5), e02435-20.

Ruben S, Garbe E, Mogavero S, Albrecht-Eckardt D, Hellwig D, Häder A, Krüger T, Gerth K, Jacobsen ID, Elshafee O, Brunke S, Hünniger K, Kniemeyer O, Brakhage AA, Morschhäuser J, Hube B, Vylkova S, Kurzai O, Martin R (2020) Ahr1 and Tup1 contribute to the transcriptional control of virulence-associated genes in *Candida albicans*. *mBio* 11(2), e00206-20.

Seelbinder B, Chen J, Brunke S, Vazquez-Uribe R, Santhanam R, Meyer AC, de Oliveira Lino FS, Chan KF, Loos D, Imamovic L, Tsang CC, Lam RP, Sridhar S, Kang K, Hube B, Woo PCY, Sommer MOA, Panagiotou G (2020) Antibiotics create a shift from mutualism to competition in human gut communities with a longer-lasting impact on fungi than bacteria. *Microbiome* 8(1), 133.

Bacher P, Hohnstein T, Beerbaum E, Röcker M, Blango MG, Kaufmann S, Röhmel J, Eschenhagen P, Grehn C, Seidel K, Rickerts V, Lozza L, Stervbo U, Nienen M, Babel N, Milleck J, Assenmacher M, Cornely OA, Ziegler M, Wisplinghoff H, Heine G, Worm M, Siegmund B, Maul J, Creutz P, Tabeling C, Ruwwe-Glösenkamp C, Sander LE, Knosalla C, Brunke S, Hube B, Kniemeyer O, Brakhage AA, Schwarz C, Scheffold A (2019) Human anti-fungal Th17 immunity and pathology rely on cross-reactivity against *Candida albicans*. *Cell* 176(6), 1340-1355.

Fischer D, Gessner G, Fill TP, Barnett R, Tron K, Dornblut K, Kloss F, Stallforth P, Hube B, Heinemann SH, Hertweck C, Scherlach K, Brunke S (2019) Disruption of membrane integrity by the bacteria-derived antifungal jagaricin. *Antimicrob Agents Chemother* 63(9), e00707-19.

Ishchuk OP, Ahmad KM, Koruza K, Bojanović K, Sprenger M, Kasper L, Brunke S, Hube B, Säll T, Hellmark T, Gullstrand B, Brion C, Freel K, Schacherer J, Regenberg B, Knecht W, Piškur J (2019) RNAi as a tool to study virulence in the pathogenic yeast *Candida glabrata*. *Front Microbiol* 10, 1679.

Siscar-Lewin S, Hube B, Brunke S (2019) Antivirulence and avirulence genes in human pathogenic fungi. *Virulence* 10(1), 935-947. (Review)

Brunke S, Hube B (2018) The needle and the damage done. *Nat Microbiol* 3(8), 860-861. (Review)

Gerwien F, Skrahina V, Kasper L, Hube B, Brunke S (2018) Metals in fungal virulence. *FEMS Microbiol Rev* 42(1), fux050. (Review)

Guerrero QW, Fan L, Brunke S, Milkowski A, Rosado-Mendez IM, Hall TJ (2018) Power spectrum consistency among systems and transducers. *Ultrasound Med Biol* 44(11), 2358-2370.

Sieber P, Voigt K, Kämmer P, Brunke S, Schuster S, Linde J (2018) Comparative study on alternative splicing in human fungal pathogens suggests its involvement during host invasion. *Front Microbiol* 9, 2313.

Wolf T, Kämmer P, Brunke S, Linde J (2018) Two's company: studying interspecies relationships with dual RNA-seq. *Curr Opin Microbiol* 42, 7-12. (Review)

Gerwien F, Safyan A, Wisgott S, Brunke S, Kasper L, Hube B (2017) The fungal pathogen *Candida glabrata* does not depend on surface ferric reductases for iron acquisition. *Front Microbiol* 8, 1055.

Hsieh SH, Brunke S, Brock M (2017) Encapsulation of antifungals in micelles protects *Candida albicans* during gall-bladder infection. *Front Microbiol* 8, 117.

Ramírez-Zavala B, Mottola A, Haubenreißer J, Schneider S, Allert S, Brunke S, Ohlsen K, Hube B, Morschhäuser J (2017) The Snf1-activating kinase Sak1 is a key regulator of metabolic adaptation and *in vivo* fitness of *Candida albicans*. *Mol Microbiol* 104(6), 989-1007.

Skrahina V, Brock M, Hube B, Brunke S (2017) *Candida albicans* Hap43 domains are required under iron starvation but not excess. *Front Microbiol* 8, 2388.

Allert S, Brunke S, Hube B (2016) *In vivo* transcriptional profiling of human pathogenic fungi during infection: reflecting the real life? *PLOS Pathog* 12(4), e1005471. (Review)

Böttcher B, Pöllath C, Staib P, Hube B, Brunke S (2016) *Candida* species rewired hyphae developmental programs for chlamydospore formation. *Front Microbiol* 7, 1697.

Brunke S, Mogavero S, Kasper L, Hube B (2016) Virulence factors in fungal pathogens of man. *Curr Opin Microbiol* 32, 89-95. (Review)

Gerwien F, Safyan A, Wisgott S, Hille F, Kämmer P, Linde J, Brunke S, Kasper L, Hube B (2016) A novel hybrid iron regulation network combines features from pathogenic and non-pathogenic yeasts. *mBio* 7(5), e01782-16.

Hebecker B, Vlaic S, Conrad T, Bauer M, Brunke S, Kapitan M, Linde J, Hube B, Jacobsen ID (2016) Dual-species transcriptional profiling during systemic candidiasis reveals organ-specific host-pathogen interactions. *Sci Rep* 6, 36055.

Hellwig D, Voigt J, Bouzani M, Löffler J, Albrecht-Eckardt D, Weber M, Brunke S, Martin R, Kurzai O, Hünniger K (2016) *Candida albicans* induces metabolic reprogramming in human NK cells and responds to perforin with a Zinc depletion response. *Front Microbiol* 7, 750.

Naranjo-Ortíz MA, Brock M, Brunke S, Hube B, Marcet-Houben M, Gabaldón T (2016) Widespread inter- and intra-Ddmain horizontal gene transfer of d-amino acid metabolism enzymes in eukaryotes. *Front Microbiol* 7, 2001.

Böttcher B, Palige K, Jacobsen ID, Hube B, Brunke S (2015) Csr1/Zap1 maintains zinc homeostasis and influences virulence in *Candida dubliniensis* but is not coupled to morphogenesis. *Eukaryot Cell* 14(7), 661-670.

Brunke S, Quintin J, Kasper L, Jacobsen ID, Richter ME, Hiller E, Schwarzmüller T, d'Enfert C, Kuchler K, Rupp S, Hube B, Ferrandon D (2015) Of mice, flies - and men? Comparing fungal infection models for large-scale screening efforts. *Dis Model Mech* (8), 473-486.

Cavet JS, Perry RD, Brunke S, Darwin KH, Fierke CA, Imlay JA, Murphy M, Schryvers AB, Thiele DJ, Weiser JN (2015) Metal ions in host microbe interactions: The microbe perspective. In: Nriagu

JO, Skaar EP (eds.) Trace Metals and Infectious Diseases. The MIT Press. Strüngmann Forum Reports. ISBN: 9780262029193.

Kasper L, Miramón P, Jablonowski N, Wisgott S, Wilson D, Brunke S, Hube B (2015) Antifungal activity of clotrimazole against *Candida albicans* depends on carbon sources, growth phase, and morphology. *J Med Microbiol* 64, 714-723.

Brunke S, Hube B (2014) Adaptive prediction as a strategy in microbial infections. *PLOS Pathog* 10(10), e1004356.

Brunke S, Seider K, Fischer D, Jacobsen ID, Kasper L, Jablonowski N, Wartenberg A, Bader O, Enache-Angoulvant A, Schaller M, d'Enfert C, Hube B (2014) One small step for a yeast - Microevolution within macrophages renders *Candida glabrata* hypervirulent due to a single point mutation. *PLOS Pathog* 10(10), e1004478.

Brunke S, Seider K, Richter ME, Bremer-Streck S, Ramachandra S, Kiehntopf M, Brock M, Hube B (2014) Histidine degradation via an aminotransferase increases the nutritional flexibility of *Candida glabrata*. *Eukaryot Cell* 13(6), 758-765.

Ene IV, Brunke S, Brown AJ, Hube B (2014) Metabolism in Fungal Pathogenesis. *Cold Spring Harb Perspect Med* 4(12),

Fischer D, Hube B, Brunke S (2014) Fine-scale chromosomal changes in fungal fitness. *J Curr Fungal Infect Rep* Vol. 8(2), 171-178. (Review)

Kasper L, Seider K, Gerwien F, Allert S, Brunke S, Schwarzmüller T, Ames L, Zubiria-Barrera C, Mansour MK, Becken U, Barz D, Vyas JM, Reiling N, Haas A, Haynes K, Kuchler K, Hube B (2014) Identification of *Candida glabrata* genes involved in pH modulation and modification of the phagosomal environment in macrophages. *PLOS One* 9(5), e96015.

Ramachandra S, Linde J, Brock M, Guthke R, Hube B, Brunke S (2014) Regulatory networks controlling nitrogen sensing and uptake in *Candida albicans*. *PLOS One* 9(3), e92734.

Schwarzmüller T, Ma B, Hiller E, Istdel F, Tscherner M, Brunke S, Ames L, Firon A, Green B, Cabral V, Marcket-Houben M, Jacobsen ID, Quintin J, Seider K, Frohner I, Glaser W, Jungwirth H, Bachellier-Bassi S, Chauvel M, Zeidler U, Ferrandon D, Gabaldón T, Hube B, d'Enfert C, Rupp S, Cormack B, Haynes K, Kuchler K (2014) Systematic phenotyping of a large-scale *Candida glabrata* deletion collection reveals novel antifungal tolerance genes. *PLOS Pathog* 10(6), e1004211.

Seider K, Gerwien F, Kasper L, Allert S, Brunke S, Jablonowski N, Schwarzmüller T, Barz D, Rupp S, Kuchler K, Hube B (2014) Immune evasion, stress resistance, and efficient nutrient acquisition are crucial for intracellular survival of *Candida glabrata* within macrophages. *Eukaryot Cell* 13(1), 170-183.

Wartenberg A, Linde J, Martin R, Schreiner M, Horn F, Jacobsen ID, Jenull S, Wolf T, Kuchler K, Guthke R, Kurzai O, Forche A, d'Enfert C, Brunke S, Hube B (2014) Microevolution of *Candida albicans* in macrophages restores filamentation in a nonfilamentous mutant. *PLOS Genet* 10(12), e1004824.

Brunke S, Hube B (2013) Two unlike cousins: *Candida albicans* and *C. glabrata* infection strategies. *Cell Microbiol* 15(5), 701-708. (Review)

Lüttich A, Brunke S, Hube B, Jacobsen ID (2013) Serial passaging of *Candida albicans* in systemic murine infection suggests that the wild type strain SC5314 is well adapted to the murine kidney. *PLOS One* 8(5), e64482.

Martin R, Albrecht-Eckardt D, Brunke S, Hube B, Hünniger K, Kurzai O (2013) A core filamentation response network in *Candida albicans* is restricted to eight genes. *PLOS One* 8(3), e58613.

Citiulo F, Jacobsen ID, Miramón P, Schild L, Brunke S, Zipfel PF, Brock M, Hube B, Wilson D (2012) *Candida albicans* scavenges host zinc via Pra1 during endothelial invasion. *PLOS Pathog* 8(6), e1002777.

Jacobsen ID, Wilson D, Wächtler B, Brunke S, Naglik JR, Hube B (2012) *Candida albicans* dimorphism as a therapeutic target. *Expert Rev Anti Infect Ther* 10(1), 85-93. (Review)

Lüttich A, Brunke S, Hube B (2012) Isolation and amplification of fungal RNA for microarray analysis from host samples. In: Brand AC, MacCallum DM (eds.) *Methods in Molecular Biology. Host-fungus interactions. Methods and Protocols*. 845, pp. 411-421. Humana Press (Springer).

Tierney L, Linde J, Müller S, Brunke S, Molina JC, Hube B, Schöck U, Guthke R, Kuchler K (2012) An interspecies regulatory network inferred from simultaneous RNA-seq of *Candida albicans* invading innate immune cells. *Front Microbiol* 3, 85.

Seider K, Brunke S, Schild L, Jablonowski N, Wilson D, Majer O, Barz D, Haas A, Kuchler K, Schaller M, Hube B (2011) The facultative intracellular pathogen *Candida glabrata* subverts macrophage cytokine production and phagolysosome maturation. *J Immunol* 187(6), 3072-3086.

Brunke S, Seider K, Almeida RS, Heyken A, Fleck CB, Brock M, Barz D, Rupp S, Hube B (2010) *Candida glabrata* tryptophan-based pigment production via the Ehrlich pathway. *Mol Microbiol* 76(1), 25-47.

Jacobsen ID, Brunke S, Seider K, Schwarzmüller T, Firon A, d'Enfert C, Kuchler K, Hube B (2010) *Candida glabrata* persistence in mice does not depend on host immunosuppression and is unaffected by fungal amino acid auxotrophy. *Infect Immun* 78(3), 1066-1077.

Butler G, Rasmussen MD, Lin MF, Santos MA, Sakthikumar S, Munro CA, Rheinbay E, Grabherr M, Forche A, Reedy JL, Agrafioti I, Arnaud MB, Bates S, Brown AJ, Brunke S, Costanzo MC, Fitzpatrick DA, de Groot PW, Harris D, Hoyer LL, Hube B, Klis FM, Kodira C, Lennard N, Logue ME, Martin R, Neiman AM, Nikolaou E, Quail MA, Quinn J, Santos MC, Schmitzberger FF, Sherlock G, Shah P, Silverstein KA, Skrzypek MS, Soll D, Staggs R, Stansfield I, Stumpf MP, Sudbery PE, Srikantha T, Zeng Q, Berman J, Berriman M, Heitman J, Gow NA, Lorenz MC, Birren BW, Kellis M, Cuomo CA (2009) Evolution of pathogenicity and sexual reproduction in eight *Candida* genomes. *Nature* 459(7247), 657-662.

Hort W, Lang S, Brunke S, Mayser P, Hube B (2009) Analysis of differentially expressed genes associated with tryptophan-dependent pigment synthesis in *M. furfur* by cDNA subtraction technology. *Med Mycol* 47(3), 248-258.

Wilson D, Thewes S, Zakikhany K, Fradin C, Albrecht A, Almeida R, Brunke S, Grosse K, Martin R, Mayer F, Leonhardt I, Schild L, Seider K, Skibbe M, Slesiona S, Waechter B, Jacobsen I, Hube B (2009) Identifying infection-associated genes of *Candida albicans* in the postgenomic era. *FEMS Yeast Res* 9(5), 688-700. (Review)

Almeida RS, Brunke S, Albrecht A, Thewes S, Laue M, Edwards JE, Filler SG, Hube B (2008) The hyphal-associated adhesin and invasin Als3 of *Candida albicans* mediates iron acquisition from host ferritin. *PLOS Pathog* 4(11), e1000217.

Brunke S, Hube B (2006) MfLIP1, a gene encoding an extracellular lipase of the lipid-dependent fungus *Malassezia furfur*. *Microbiology* 152(Pt 2), 547-554.

\*equal contribution #corresponding author