

# Publications

Dumjahn L, Wein P, Molloy EM, Scherlach K, Trottmann F, Meisinger P, Judd LM, Pidot SJ, Stinear TP, Richter I, Hertweck C (2025) Dual-use virulence factors of the opportunistic pathogen *Chromobacterium haemolyticum* mediate haemolysis and colonization. *bioRxiv* [Preprint]

Nikitashina V, Bartels B, Mansour JS, LeKieffre C, Decelle J, Hertweck C, Not F, Pohnert G (2025) The give and take in photosymbiosis unraveled by metabolomics of *Radiolaria*. *bioRxiv* [Preprint]

Büttner H, Rassbach J, Schultz C, Popp J, Gressler M, Hertweck C (2024) Beneficial soil fungus kills predatory nematodes with dehydropeptides translocating into the animal gut. *J Am Chem Soc* 146(50), 34702-34710.

Carrasco Flores D, Hotter V, Vuong T, Hou Y, Bando Y, Scherlach K, Burgunter-Delamare B, Hermenau R, Komor AJ, Aiyar P, Rose M, Sasso S, Arndt HD, Hertweck C, Mittag M (2024) A mutualistic bacterium rescues a green alga from an antagonist. *Proc Natl Acad Sci U S A* 121(15), e2401632121.

Dell M, Tran MA, Capper MJ, Sundaram S, Fiedler J, Koehnke J, Hellmich UA, Hertweck C (2024) Trapping of a polyketide synthase module after C-C bond formation reveals transient acyl carrier domain interactions. *Angew Chem Int Ed* 63(9), e202315850.

Dörner S, Trottmann F, Jordan P, Bartels B, Rogge K, Werz O, Hertweck C, Hoffmeister D (2024) The fatal mushroom neurotoxin muscarine is released from a harmless phosphorylated precursor upon cellular injury. *Angew Chem Int Ed* 63(52), e202417220.

Ehinger FJ, Hertweck C (2024) Biosynthesis and recruitment of reactive amino acids in nonribosomal peptide assembly lines. *Curr Opin Chem Biol* 81, 102494. (Review)

Ehinger FJ, Scherlach K, Trottmann F, Fiedler J, Richter I, Hertweck C (2024) A catch-release strategy for the genomics-driven discovery of antiproliferative furan-functionalized peptides. *Angew Chem Int Ed*, e202421760.

Fiedler J, Trottmann F, Ishida K, Mie II, Hertweck C (2024) Direct  $\alpha$ -hydroxy acid loading onto a bacterial thiotemplate assembly line via a multienzyme gateway. *Angew Chem Int Ed* 63(30), e202405165.

Giger GH, Ernst C, Richter I, Gassler T, Field CM, Sintsova A, Kiefer P, Gäbelein CG, Guillaume-Gentil O, Scherlach K, Bortfeld-Miller M, Zambelli T, Sunagawa S, Künzler M, Hertweck C, Vorholt JA (2024) Inducing novel endosymbioses by implanting bacteria in fungi. *Nature* 635(8038), 415-422.

Haensch VG, Hertweck C (2024) Photosensitizers enable the formation of biphenyls with UV-LEDs and sunlight. *Chemistry* 30(27), e202400605.

Hoffmann A, Steffens U, Maček B, Franz-Wachtel M, Nieselt K, Harbig TA, Scherlach K, Hertweck C, Sahl HG, Bierbaum G (2024) The unusual mode of action of the polyketide glycoside antibiotic cervimycin C. *mSphere* 9(5), e0076423.

Ishida K, Litomska A, Dunbar KL, Hertweck C (2024) An enzymatic prodrug-like route to thio and

selenoamides. *Angew Chem Int Ed* 63(31), e202404243.

Kries H, Trottmann F, Hertweck C (2024) Novel biocatalysts from specialized metabolism. *Angew Chem Int Ed* 63(4), e202309284. (Review)

Little RF, Trottmann F, Hashizume H, Preissler M, Unger S, Sawa R, Kries H, Pidot S, Igarashi M, Hertweck C (2024) Analysis of the valgamycin biosynthetic pathway reveals a general mechanism for cyclopropanol formation across diverse natural product scaffolds. *ACS Chem Biol* 19(3), 660-668.

Mlotek MD, Dose B, Hertweck C (2024) Bacterial isothiocyanate biosynthesis by Rhodanese-catalyzed sulfur transfer onto Isonitriles. *ChemBioChem* 25(3), e202300732.

Reinhold A, Gessner AL, Scherlach K, Walther G, Nyirenda S, Borkowetz A, Mothes AR, Hertweck C, Mothes H (2024) Maize flour processing determines the fumonisin intake of South Malawi residents. *J Food Process Preserv* Vol 2024(1),

Richter I, Hasan M, Kramer JW, Wein P, Krabbe J, Woitas KP, Stinear TP, Pidot SJ, Kloss F, Hertweck C, Lackner G (2024) Deazaflavin metabolite produced by endosymbiotic bacteria controls fungal host reproduction. *ISME J* 18(1), wrae074.

Roman D, Meisinger P, Guillonneau R, Peng CC, Peltner LK, Jordan PM, Haensch V, Götze S, Werz O, Hertweck C, Chen Y, Beemelmans C (2024) Structure revision of a widespread marine sulfonolipid class based on isolation and total synthesis. *Angew Chem Int Ed* 63(23), e202401195.

Schaefer S, Vij R, Sprague JL, Austermeier S, Dinh H, Judzewitsch PR, Müller-Loennies S, Lopes Silva T, Seemann E, Qualmann B, Hertweck C, Scherlach K, Gutschmann T, Cain AK, Corrigan N, Gresnigt MS, Boyer C, Lenardon MD, Brunke S (2024) A synthetic peptide mimic kills *Candida albicans* and synergistically prevents infection. *Nat Commun* 15(1), 6818.

Büttner H, Hörl J, Krabbe J, Hertweck C (2023) Discovery and biosynthesis of anthrochelin, a growth-promoting metallophore of the human pathogen *Luteibacter anthropi*. *ChemBioChem* 24(17), e202300322.

Büttner H, Pidot SJ, Scherlach K, Hertweck C (2023) Endofungal bacteria boost anthelmintic host protection with the biosurfactant symbiosin. *Chem Sci* 14(1), 103-112.

Ehinger F, Niehs S, Dose B, Dell M, Krabbe J, Pidot SJ, Stinear TP, Scherlach K, Ross C, Lackner G, Hertweck C (2023) Analysis of rhizonin biosynthesis reveals origin of pharmacophoric furylalanine moieties in diverse cyclopeptides. *Angew Chem Int Ed* 62(42), e202308540.

Götze S, Vij R, Burow K, Thome N, Urvat 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.

Herrisse M, Ishida K, Staiger-Creed J, Judd L, Williams SJ, Howden BP, Stinear TP, Dahse HM, Voigt K, Hertweck C, Pidot SJ (2023) Discovery and biosynthesis of the cytotoxic polyene terpenomycin in human pathogenic *Nocardia*. *ACS Chem Biol* 18(8), 1872-1879.

Joch M, Wojtas KP, Torres-Gómez H, Li Y, Meyer F, Straßburger M, Kerndl V, Dahse HM, Hertweck C, Hoffmann H, Görls H, Walter K, Hölscher C, Kloss F (2023) Whole cell hydride Meisenheimer complex biotransformation guided optimization of antimycobacterial benzothiazinones. *Eur J Med Chem* 264, 116023.

Klapper M\*, Hübner A\*, Ibrahim A\*, Wasmuth I, Borry M, Haensch VG, Zhang S, Al-Jammal WK, Suma H, Fellows Yates JA, Frangenberg J, Velsko IM, Chowdhury S, Herbst R, Bratovanov EV, Dahse HM, Horch T, Hertweck C, González Morales MR, Straus LG, Vilotijevic I, Warinner C, Stallforth P (2023) Natural products from reconstructed bacterial genomes of the Middle and Upper paleolithic. *Science* 380(6645), 619-624.

Krespach MKC, Stroe MC, Netzker T, Rosin M, Zehner LM, Komor AJ, Beilmann JM, Krüger T, Scherlach K, Kniemeyer O, Schroeckh V, Hertweck C, Brakhage AA (2023) *Streptomyces* polyketides mediate bacteria-fungi interactions across soil environments. *Nat Microbiol* 8(7), 1348-1361.

Rassbach J, Hilsberg N, Haensch VG, Dörner S, Gressler J, Sonnabend R, Semm C, Voigt K, Hertweck C, Gressler M (2023) Non-canonical two-step biosynthesis of anti-oomycete indole alkaloids in Kickxellales. *Fungal Biol Biotechnol* 1010(1), 19.

Richter I, Uzum Z, Wein P, Molloy EM, Moebius N, Stinear TP, Pidot SJ, Hertweck C (2023) Transcription activator-like effectors from endosymbiotic bacteria control the reproduction of their fungal host. *mBio* 14(6), e0182423.

Richter I, Wein P, Uzum Z, Stanley CE, Krabbe J, Molloy EM, Moebius N, Ferling I, Hillmann F, Hertweck C (2023) Transcription activator-like effector protects bacterial endosymbionts from entrapment within fungal hyphae. *Curr Biol* 33(13), 2646-2656.e4..

Schäfer E, Seibold PS, Bartram S, Trottmann F, Hänsch V, Gressler M, Chadeayne A, Hertweck C, O'Connor S, Hoffmeister D (2023) A "Magic Mushroom" multi-product sesquiterpene synthase. *ChemBioChem* 24(21), e202300511.

Stallforth P\*, Mittag M, Brakhage AA, Hertweck C, Hellmich UA\* (2023) Functional modulation of chemical mediators in microbial communities. *Trends Biochem Sci* 48(1), 71-81. (Review)

Trottmann F, Fiedler J, Ishida K, Ishida-Ito M, Little RF, Hertweck C (2023) Bacterial pathogen channels medium-sized fatty acids into malleicyprol biosynthesis. *ACS Chem Biol* 18(7), 1557-1563.

Weber JN, Minner-Meinen R, Behnecke M, Biedendieck R, Hänsch VG, Hercher TW, Hertweck C, van den Hout L, Knüppel L, Sivov S, Schulze J, Mendel RR, Hänsch R, Kaufholdt D (2023) Moonlighting Arabidopsis molybdate transporter 2 family and GSH-complex formation facilitate molybdenum homeostasis. *Commun Biol* 6(1), 801.

Wein P, Dornblut K, Herkersdorf S, Krüger T, Molloy EM, Brakhage AA, Hoffmeister D, Hertweck C (2023) Bacterial secretion systems contribute to rapid tissue decay in button mushroom soft rot disease. *mBio* 14(4), e0078723.

Bredy F, Ishida K, Hertweck C (2022) A type III polyketide synthase specific for sporulating negativicutes is responsible for alkylpyrone biosynthesis. *ChemBioChem* 23(21), e202200431.

Dell M, Dunbar KL, Hertweck C (2022) Ribosome-independent peptide biosynthesis: the challenge

of a unifying nomenclature. *Nat Prod Rep* 39(3), 453-459. (Review)

Dietrich A, Steffens U, Gajdiss M, Boschert AL, Dröge JK, Szekat C, Sass P, Malik IT, Bornikoel J, Reinke L, Maček B, Franz-Wachtel M, Nieselt K, Harbig T, Scherlach K, Brötz-Oesterhelt H, Hertweck C, Sahl HG, Bierbaum G (2022) Cervimycin-resistant *Staphylococcus aureus* strains display Vancomycin-intermediate resistant phenotypes. *Microbiol Spectr* 10(5), e0256722.

Gude F, Molloy EM, Horch T, Dell M, Dunbar KL, Krabbe J, Groll M, Hertweck C (2022) A specialized polythioamide-binding protein confers antibiotic self-resistance in anaerobic bacteria. *Angew Chem Int Ed* 61(37), e202206168.

Haensch V, Neuwirth T, Bergner A, Bruhnke J, Kloss F, Hertweck C (2022) Sustainable and highly controlled aryl couplings revealed by systematic assessment of photoactivatable linkers. *Chem Sci* 13(19), 5680-5686.

Haensch VG, Görls H, Hertweck C (2022) A photochemical macrocyclization route to asymmetric strained [3.2] paracyclophanes. *Chemistry* 28(69), e202202577.

Horch T, Molloy EM, Bredy F, Haensch VG, Scherlach K, Dunbar KL, Franke J, Hertweck C (2022) Alternative benzoxazole assembly discovered in anaerobic bacteria provides access to privileged heterocyclic scaffold. *Angew Chem Int Ed* 61(32), e202205409.

Janke RS, Kaftan F, Niehs SP, Scherlach K, Rodrigues A, Svatoš A, Hertweck C, Kaltenpoth M, Flórez LV (2022) Bacterial ectosymbionts in cuticular organs chemically protect a beetle during molting stages. *ISME J* 16(12), 2691-2701.

Kim HJ, Ishida K, Hertweck C (2022) Thiotemplated biosynthesis of bacterial polyene fatty acids by a designated desaturase triad. *ChemBioChem* 23(21), e202200430.

Kim HJ, Ishida K, Ishida-Ito M, Hertweck C (2022) Sequential allylic alcohol formation by a multifunctional cytochrome P450 monooxygenase with rare redox partners. *Angew Chem Int Ed* 61(26), e202203264.

Klemm P, Solomun JI, Rodewald M, Kuchenbrod MT, Hänsch VG, Richter F, Popp J, Hertweck C, Hoepfener S, Bonduelle C, Lecommandoux S, Traeger A, Schubert S (2022) Efficient gene delivery of tailored amphiphilic polypeptides by polyplex surfing. *Biomacromolecules* 23(11), 4718-4733.

Krumbholz J, Ishida K, Baunach M, Teikari JE, Rose MM, Sasso S, Hertweck C, Dittmann E (2022) Deciphering chemical mediators regulating specialized metabolism in a symbiotic cyanobacterium. *Angew Chem Int Ed* 61(26), e202204545.

Lenz C, Dörner S, Trottmann F, Hertweck C, Sherwood A, Hoffmeister D (2022) Assessment of bioactivity-modulating pseudo-ring formation in psilocin and related tryptamines. *ChemBioChem* 23(13), e202200183.

Little R, Trottmann F, Preissler M, Hertweck C (2022) An intramodular thioesterase domain catalyses chain release in the biosynthesis of a cytotoxic virulence factor. *RSC Chem Biol* 3(9), 1121-1128.

Little RF, Hertweck C (2022) Chain release mechanisms in polyketide and non-ribosomal peptide biosynthesis. *Nat Prod Rep* 39(1), 163-205. (Review)

Michel M, Benítez-Buelga C, Calvo PA, Hanna BMF, Mortusewicz O, Masuyer G, Davies J, Wallner O, Sanjiv K, Albers JJ, Castañeda-Zegarra S, Jemth AS, Visnes T, Sastre-Perona A, Danda AN, Homan EJ, Marimuthu K, Zhenjun Z, Chi CN, Sarno A, Wiita E, von Nicolai C, Komor AJ, Rajagopal V, Müller S, Hank EC, Varga M, Scaletti ER, Pandey M, Karsten S, Haslene-Hox H, Loevenich S, Marttila P, Rasti A, Mamonov K, Ortis F, Schömberg F, Loseva O, Stewart J, D'Arcy-Evans N, Koolmeister T, Henriksson M, Michel D, de Ory A, Acero L, Calvete O, Scobie M, Hertweck C, Vilotijevic I, Kalderén C, Osorio A, Perona R, Stolz A, Stenmark P, Berglund UW, de Vega M, Helleday T (2022) Small-molecule activation of OGG1 increases oxidative DNA damage repair by gaining a new function. *Science* 376(6600), 1471-1476.

Molloy, E. M., Feldmann R., Hertweck C. (2022) Peptide splicing is a prevalent biosynthetic strategy for installing  $\beta$ -amino acid pharmacophores. *CellPress* 8(11), 2894-2897. (Review)

Morales-Amador A, Souto ML, Hertweck C, Fernández JJ, García-Altare M (2022) Rapid screening of polyol polyketides from marine Dinoflagellates. *Anal Chem* 94(41), 14205-14213.

Pourmasoumi F, De S, Peng H, Trottmann F, Hertweck C, Kries H (2022) Proof-reading thioesterase boosts activity of engineered nonribosomal peptide synthetase. *ACS Chem Biol* 17(9), 2382-2388.

Richter I, Radosa S, Cseresnyés Z, Ferling I, Büttner H, Niehs SP, Gerst R, Scherlach K, Figge MT, Hillmann F, Hertweck C (2022) Toxin-producing endosymbionts shield pathogenic fungus against micropredators. *mBio* 13(5), e0144022.

Sharma G, Islam ST, Rahi P, Silby MW, Giovannelli D, Welander PV, Ehling-Schulz M, Chaudhry V, Molloy E, Hertweck C, Mundra S, Kalia VC, Lal R, Singh Y, Ruby E, Weigel C, Kolter R (2022) Reply to Oren *et al.*, "New phylum names harmonize prokaryotic nomenclature". *mBio* 13(5), e0232322. (Review)

Trottmann F, Ishida K, Ishida-Ito M, Kries H, Groll M, Hertweck C (2022) Pathogenic bacteria remodel central metabolic enzyme to build a cyclopropanol warhead. *Nat Chem* 14(8), 884-890.

Büttner H, Niehs SP, Vandelannoote K, Cseresnyés Z, Dose B, Richter I, Gerst R, Figge MT, Stinear TP, Pidot SJ, Hertweck C<sup>#</sup> (2021) Bacterial endosymbionts protect beneficial soil fungus from nematode attack. *Proc Natl Acad Sci U S A* 118(37), e2110669118.

Ding L, Görls H, Hertweck C (2021) Plant-like cadinane sesquiterpenes from an actinobacterial mangrove endophyte. *Magn Reson Chem* 59(1), 34-42.

Dose B, Niehs SP, Scherlach K, Shahda S, Flórez LV<sup>#</sup>, Kaltenpoth M, Hertweck C (2021) Biosynthesis of sinapigliadioside, an antifungal isothiocyanate from *Burkholderia* symbionts. *Chembiochem* 22(11), 1920-1924.

Dose B, Thongkongkaew T, Zopf D, Kim HJ, Bratovanov EV, García-Altare M, Scherlach K, Kumpfmüller J, Ross C, Hermenau R, Niehs S, Silge A, Hniopek J, Schmitt M, Popp J, Hertweck C (2021) Multimodal molecular imaging and identification of bacterial toxins causing mushroom soft rot and cavity disease. *Chembiochem* 22(19), 2901-2907.

Gama S, Hermenau R, Frontauria M, Milea D, Sammartano S, Hertweck C, Plass W (2021) Iron coordination properties of gramibactin as model for the new class of diazeniumdiolate based siderophores. *Chemistry* 27(8), 2724-2733.

Herkersdorf S, Krüger T, Wein P, Löffler S, Fontaine T, Gressler M, Hertweck C, Brakhage AA, Hoffmeister D (2021) Bacterial cell wall-degrading enzymes induce basidiomycete natural product biosynthesis. *Environ Microbiol* 23(8), 4360-4371.

Krespach MKC, Stroe MC, Flak M, Komor AJ, Nietzsche S, Sasso S, Hertweck C, Brakhage AA (2021) Bacterial marginolactones trigger formation of algal gloeocapsoids, protective aggregates on the verge of multicellularity. *Proc Natl Acad Sci U S A* 118(45), e2100892118.

Liu M, Ohashi M, Hung YS, Scherlach K, Watanabe K, Hertweck C, Tang Y (2021) AoiQ catalyzes geminal dichlorination of 1,3-diketone natural products. *J Am Chem Soc* 143(19), 7267-7271.

Mahler L, Niehs SP, Martin K, Weber T, Scherlach K, Hertweck C, Roth M, Rosenbaum MA (2021) Highly parallelized droplet cultivation and prioritization of antibiotic producers from natural microbial communities. *eLife* 10, e64774.

Molloy EM, Dell M, Haensch VG, Dunbar KL, Feldmann R, Oberheide A, Seyfarth L, Kumpfmüller J, Horch T, Arndt HD, Hertweck C (2021) Enzyme-primed native chemical ligation produces autoinducing cyclopeptides in clostridia. *Angew Chem Int Ed* 60(19), 10670-10679.

Mullins AJ, Webster G, Kim HJ, Zhao J, Petrova YD, Ramming CE, Jenner M, Murray JAH, Connor TR, Hertweck C, Challis GL, Mahenthiralingam E (2021) Discovery of the *Pseudomonas* polyene protegencin by a phylogeny-guided study of polyene biosynthetic gene cluster diversity. *mBio* 12(4), e0071521.

Rose MM, Scheer D, Hou Y, Hotter VS, Komor AJ, Aiyar P, Scherlach K, Vergara F, Yan Q, Loper JE, Jakob T, van Dam NM, Hertweck C, Mittag M, Sasso S (2021) The bacterium *Pseudomonas protegens* antagonizes the microalga *Chlamydomonas reinhardtii* using a blend of toxins. *Environ Microbiol* 23(9), 5525-5540.

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.

Scherlach K, Hertweck C (2021) Mining and unearthing hidden biosynthetic potential. *Nat Commun* 12(1), 3864. (Review)

Scherlach K, Kutenlochner W, Scharf DH, Brakhage AA, Hertweck C, Groll M, Huber EM (2021) Structural and mechanistic insights into C-S bond formation in gliotoxin. *Angew Chem Int Ed* 60(25), 14188-14194.

Senges CHR, Stepanek JJ, Wenzel M, Raatschen N, Ay Ü, Märten Y, Prochnow P, Vázquez Hernández M, Yayci A, Schubert B, Janzing NBM, Warmuth HL, Kozik M, Bongard J, Alumasa JN, Albada B, Penkova M, Lukežič T, Sorto NA, Lorenz N, Miller R, Zhu B, Benda M, Stülke J, Schäkermann S, Leichert LI, Scheinpflug K, Brötz-Oesterhelt H, Hertweck C, Shaw JT, Petković H, Brunel JM, Keiler KC, Metzler-Nolte N, Bandow JE (2021) Comparison of proteomic responses as global approach to antibiotic mechanism of action elucidation. *Antimicrob Agents Chemother* 65(1), e01373-20.

Tsunematsu Y, Maeda N, Sato M, Hara K, Hashimoto H, Watanabe K, Hertweck C (2021) Specialized flavoprotein promotes sulfur migration and spiroaminal formation in aspirochlorine biosynthesis. *J Am Chem Soc* 143(1), 206-213.

Blei F, Dörner S, Fricke J, Baldeweg F, Trottmann F, Komor AJ, Meyer F, Hertweck C, Hoffmeister D (2020) Simultaneous production of psilocybin and a cocktail of  $\beta$ -carboline monoamine oxidase inhibitors in 'magic' mushrooms. *Chem Eur J* 26(3), 729-734.

Ding L, Hertweck C (2020) Oxygenated geosmins and plant-like eudesmanes from a bacterial mangrove endophyte. *J Nat Prod* 83(7), 2207-2211.

Dose B, Ross C, Niehs SP, Scherlach K, Bauer JP, Hertweck C (2020) Food-poisoning bacteria employ a citrate synthase and a type II NRPS to synthesize bolaamphiphilic lipopeptide antibiotics. *Angew Chem Int Ed* 59(48), 21535-21540.

Dunbar KL, Dell M, Gude F, Hertweck C (2020) Reconstitution of polythioamide antibiotic backbone formation reveals unusual thiotemplated assembly strategy. *Proc Nat Acad Sci USA* 117(16), 8850-8858.

Dunbar KL, Dell M, Molloy EM, Büttner H, Kumpfmüller J, Hertweck C (2020) An unexpected split-merge pathway to the symmetric nonribosomal peptide antibiotic closthioamide. *Angew Chem Int Ed* 60(8), 4104-4109.

Hermenau R, Kugel S, Komor AJ, Hertweck C (2020) Helper bacteria halt and disarm mushroom pathogens by linearizing structurally diverse cyclolipopeptides. *Proc Natl Acad Sci U S A* 117(38), 23802-23806.

Ishida K, Shabuer G, Schieferdecker S, Pidot SJ, Stinear TP, Knuepfer U, Cyrulies M, Hertweck C (2020) Oak-associated negatovicute equipped with ancestral aromatic polyketide synthase produces antimycobacterial dendrubins. *Chem Eur J* 26(58), 13147-13151.

Krespach MKC, García-Altres M, Flak M, Schoeler H, Scherlach K, Netzker T, Schmalzl A, Mattern DJ, Schroeckh V, Komor AJ, Mittag M, Hertweck C, Brakhage AA (2020) Lichen-like association of *Chlamydomonas reinhardtii* and *Aspergillus nidulans* protects algal cells from bacteria. *ISME J* 14(11), 2794-2805.

Lenz C, Wick J, Braga D, Garcia-Altres M, Lackner G, Hertweck C, Gressler M, Hoffmeister D (2020) Injury-triggered blueing reactions of *Psilocybe* "magic" mushrooms. *Angew Chem Int Ed* 59(4), 1450-1454.

Neuwirth T, Letzel AC, Tank C, Ishida K, Cyrulies M, Schmölz L, Lorkowski S, Hertweck C (2020) Induced production, synthesis and immunomodulatory action of clostrisulfone, a diarylsulfone from *Clostridium acetobutylicum*. *Chemistry* 26(68), 15855-15858.

Niehs SP, Dose B, Richter S, Pidot SJ, Dahse HM, Stinear TP, Hertweck C (2020) Mining symbionts of spider-transmitted fungus illuminates uncharted biosynthetic pathways to cytotoxic benzolactones. *Angew Chem Int Ed* 59(20), 7766-7771.

Niehs SP, Kumpfmüller J, Dose B, Little RF, Ishida K, Florez LV, Kaltenpoth M, Hertweck C (2020) Insect-associated bacteria assemble the antifungal butenolide gladiofungin by non-canonical polyketide chain termination. *Angew Chem Int Ed* 59(51), 23122-23126.

Scherlach K, Hertweck C (2020) Chemical mediators at the bacterial-fungal interface. *Annu Rev Microbiol* 74, 267-290. (Review)

Stroe MC, Netzker T, Scherlach K, Krüger T, Hertweck C, Valiante V, Brakhage AA (2020)

Targeted induction of a silent fungal gene cluster encoding the bacteria-specific germination inhibitor fumigermin. *eLife* 9, e52541.

Trottmann F, Ishida K, Franke J, Stanišić A, Ishida-Ito M, Kries H, Pohnert G, Hertweck C (2020) Sulfonium acids loaded onto an unusual thiotemplate assembly line construct the cyclopropanol warhead of a *Burkholderia* virulence factor. *Angew Chem Int Ed* 59(32), 13511-13515.

Waterworth SC, Flórez LV, Rees ER, Hertweck C, Kaltenpoth M, Kwan JC (2020) Horizontal gene transfer to a defensive symbiont with a reduced genome in a multipartite beetle microbiome. *mBio* 11(1), e02430-19.

Braga D, Last D, Hasan M, Guo H, Leichnitz D, Uzum Z, Richter I, Schalk F, Beemelmans C, Hertweck C, Lackner G (2019) Metabolic pathway rerouting in *Paraburkholderia rhizoxinica* evolved long-overlooked derivatives of coenzyme F420. *ACS Chem Biol* 14(9), 2088-2094.

Bratovanov EV, Ishida K, Heinze B, Pidot SJ, Stinear TP, Hegemann JD, Marahiel MA, Hertweck C (2019) Genome mining and heterologous expression reveal two distinct families of lasso peptides highly conserved in endofungal bacteria. *ACS Chem Biol* 15(5), 1169-1176.

Costa JH, Wassano CI, Angolini CFF, Scherlach K, Hertweck C, Fill TP (2019) Antifungal potential of secondary metabolites involved in the interaction between citrus pathogens. *Sci Rep* 9(1), 18647.

Dörfer M, Heine D, König S, Gore S, Werz O, Hertweck C, Gressler M, Hoffmeister D (2019) Melleolides impact fungal translation via elongation factor 2. *Org Biomol Chem* 17(19), 4906-4916.

Dunbar KL, Dell M, Molloy EM, Kloss F, Hertweck C (2019) Reconstitution of iterative thioamidation in closthioamide biosynthesis reveals a novel nonribosomal peptide backbone-tailoring strategy. *Angew Chem Int Ed* 58(37), 13014-13018.

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.

Haensch VG, Neuwirth T, Steinmetzer J, Kloss F, Beckert R, Gräfe S, Kupfer S, Hertweck C (2019) Metal-free aryl cross-coupling directed by traceless linkers. *Chem Eur J* 25(70), 16068-16073.

Herrisse M, Ishida K, Porter JL, Howden B, Hertweck C, Stinear TP, Pidot SJ (2019) Identification and mobilization of a cryptic antibiotic biosynthesis gene locus from a human-pathogenic nocardia isolate. *ACS Chem Biol* 15(5), 1161-1168.

Hermenau R, Mehl JL, Ishida K, Dose B, Ishida-Ito M, Pidot SJ, Stinear TP, Hertweck C (2019) Genomics-driven discovery of NO-donating diazeniumdiolate siderophores in diverse plant-associated bacteria. *Angew Chem Int Ed* 58(37), 13024-13029.

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.



- Kramell AE, García-Altare M, Pötsch M, Kluge R, Rother A, Hause G, Hertweck C, Csuk R (2019) Mapping natural dyes in archeological textiles by imaging mass spectrometry. *Sci Rep* 9(1), 2331.
- Molloy EM, Dell M, Hertweck C (2019) Discovery of amidotemplated natural product assembly. *Biochemistry* 58(46), 4583-4584. (Review)
- Niehs SP, Dose B, Scherlach K, Pidot SJ, Stinear TP, Hertweck C (2019) Genome mining reveals endopyrroles from a nonribosomal peptide assembly line triggered in fungal-bacterial symbiosis. *ACS Chem Biol* 14(8), 1811-1818.
- Pancrace C, Ishida K, Briand E, Gatte Pichi D, Weiz AR, Guljamow A, Scalvenzi T, Sassoon N, Hertweck C, Dittmann E, Gugger M (2019) Unique biosynthetic pathway in bloom-forming cyanobacterial genus *Microcystis* jointly assembles cytotoxic aeruginoguanidines and microguanidines. *ACS Chem Biol* 14(1), 67-75.
- Peng H, Ishida K, Hertweck C (2019) Loss of single domain function in modular assembly line alters size and shape of complex polyketide. *Angew Chem Int Ed* 58(50), 18252-18256.
- Peng H, Ishida K, Sugimoto Y, Jenke-Kodama H, Hertweck C (2019) Emulating evolutionary processes to morph aureothin-type modular polyketide synthases and associated oxygenases. *Nat Commun* 10(1), 3918.
- Schieferdecker S, Shabuer G, Knuepfer U, Hertweck C (2019) Clostrindolin is an antimycobacterial pyrone alkaloid from *Clostridium beijerinckii*. *Org Biomol Chem* 17(25), 6119-6121.
- Schieferdecker S, Shabuer G, Letzel AC, Urbansky B, Ishida-Ito M, Ishida K, Cyrulies M, Dahse HM, Pidot S, Hertweck C (2019) Biosynthesis of diverse antimicrobial and antiproliferative acyloins in anaerobic bacteria. *ACS Chem Biol* 14(7), 1490-1497.
- Trottmann F, Franke J, Ishida K, Garcia-Altare M, Hertweck C (2019) A pair of bacterial siderophores releases and traps an intercellular signal molecule: An unusual case of natural nitron bioconjugation. *Angew Chem Int Ed* 58(1), 200-204.
- Trottmann F, Franke J, Richter I, Ishida K, Cyrulies M, Dahse HM, Regestein L, Hertweck C (2019) Cyclopropanol warhead in malleicyprol confers virulence of human- and animal-pathogenic *Burkholderia* species. *Angew Chem Int Ed* 58(40), 14129-14133.
- Dose B, Niehs SP, Scherlach K, Flórez LV, Kaltenpoth M, Hertweck C (2018) Unexpected bacterial origin of the antibiotic icosalide: Two-tailed depsipeptide assembly in multifarious *Burkholderia* symbionts. *ACS Chem Biol* 13(9), 2414-2420.
- Dunbar KL, Büttner H, Molloy EM, Dell M, Kumpfmüller J, Hertweck C (2018) Genome editing reveals novel thiotemplated assembly of polythioamide antibiotics in anaerobic bacteria. *Angew Chem Int Ed* 57(43), 14080-14084.
- Fischer J, Müller SY, Netzker T, Jäger N, Gacek-Matthews A, Scherlach K, Stroe MC, García-Altare M, Pezzini F, Schoeler H, Reichelt M, Gershenzon, Krespach MK, Shelest E, Schroeckh V, Valiante V, Heinzl T, Hertweck C, Strauss J, Brakhage AA (2018) Chromatin mapping identifies BasR, a key regulator of bacteria-triggered production of fungal secondary metabolites. *eLife* 7, e40969.

- Flórez LV, Scherlach K, Miller IJ, Rodrigues A, Kwan JC, Hertweck C, Kaltenpoth M (2018) An antifungal polyketide associated with horizontally acquired genes supports symbiont-mediated defense in *Lagria villosa* beetles. *Nat Commun* 9(1), 2478.
- Heimerl N, Hommel E, Westermann M, Meichsner D, Lohr M, Hertweck C, Grossman AR, Mittag M, Sasso S (2018) A giant type I polyketide synthase participates in zygospore maturation in *Chlamydomonas reinhardtii*. *Plant J* 95(2), 268-281.
- Heine D, Holmes NA, Worsley SF, Santos ACA, Innocent TM, Scherlach K, Patrick EH, Yu DW, Murrell JC, Vieria PC, Boomsma JJ, Hertweck C, Hutchings MI, Wilkinson B (2018) Chemical warfare between leafcutter ant symbionts and a co-evolved pathogen. *Nat Commun* 9(1), 2208.
- Hermenau R, Ishida K, Gama S, Hoffmann B, Pfeifer-Leeg M, Plass W, Mohr JF, Wichard T, Saluz HP, Hertweck C (2018) Gramibactin is a bacterial siderophore with a diazeniumdiolate ligand system. *Nat Chem Biol* 14(9), 841-843.
- Kloss F, Neuwirth T, Haensch VG, Hertweck C (2018) Metal-free synthesis of pharmaceutically important biaryls by photosplicing. *Angew Chem Int Ed* 57(44), 14476-14481.
- Litomska A, Ishida K, Dunbar KL, Boettger M, Coyne S, Hertweck C (2018) Enzymatic thioamide formation in a bacterial antimetabolite pathway. *Angew Chem Int Ed* 57(36), 11574-11578.
- Mahler L, Wink K, Beulig RJ, Scherlach K, Tovar M, Zang E, Martin K, Hertweck C, Belder D, Roth M (2018) Publisher Correction: Detection of antibiotics synthesized in microfluidic picolitre-droplets by various actinobacteria. *Sci Rep* 8(1), 15859.
- Niehs SP, Dose B, Scherlach K, Roth M, Hertweck C (2018) Genomics-driven discovery of a symbiont-specific cyclopeptide from bacteria residing in the rice seedling blight fungus. *ChemBioChem* 19(20), 2167-2172.
- Niehs SP, Scherlach K, Hertweck C (2018) Genomics-driven discovery of a linear lipopeptide promoting host colonization by endofungal bacteria. *Org Biomol Chem* 16(37), 8345-8352.
- 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.
- Scherlach K, Hertweck C (2018) Mediators of mutualistic microbe-microbe interactions. *Nat Prod Rep* 35(4), 303-308. (Review)
- Sundaram S, Kim HJ, Bauer R, Thongkongkaew T, Heine D, Hertweck C (2018) On-line polyketide cyclization into diverse medium-sized lactones by a specialized ketosynthase domain. *Angew Chem Int Ed* 57(35), 11223-11227.
- Thongkongkaew T, Ding W, Bratovanov E, Oueis E, Garcia-Altare M, Ziburanyi N, Harmrolfs K, Zhang Y, Scherlach K, Müller R, Hertweck C (2018) Two types of threonine-tagged lipopeptides synergize in host colonization by pathogenic *Burkholderia* species. *ACS Chem Biol* 13(5), 1370-1379.
- Tsunematsu Y, Maeda N, Yokoyama M, Chankhamjon P, Watanabe K, Scherlach K, Hertweck C (2018) Enzymatic amide tailoring expedites unusual retro-aldol-type amino acid conversion to form antifungal cyclopeptide. *Angew Chem Int Ed* 57(43), 14051-14054.

Aiyar P, Schaeme D, García-Altres M, Carrasco Flores D, Dathe H, Hertweck C, Sasso S, Mittag M (2017) Antagonistic bacteria disrupt calcium homeostasis and immobilize algal cells. *Nat Commun* 8(1), 1756.

Brandenburger E, Gressler M, Leonhardt R, Lackner G, Habel A, Hertweck C, Brock M, Hoffmeister D (2017) A highly conserved basidiomycete peptide synthetase produces a trimeric hydroxamate siderophore. *Appl Environ Microbiol* 83(21), e01478.

Brandt P, García-Altres M, Nett M, Hertweck C, Hoffmeister D (2017) Induced chemical defense of a mushroom by a double-bond-shifting polyene synthase. *Angew Chem Int Ed* 56(21), 5937-5941.

Dunbar KL, Scharf DH, Litomska A, Hertweck C (2017) Enzymatic Carbon-Sulfur Bond Formation in Natural Product Biosynthesis. *Chem Rev* 117(8), 5521-5577. (Review)

Flórez LV, Scherlach K, Gaube P, Ross C, Sitte E, Hermes C, Rodrigues A, Hertweck C, Kaltenpoth M (2017) Antibiotic-producing symbionts dynamically transition between plant pathogenicity and insect-defensive mutualism. *Nat Commun* 8, 15172.

Guljamow A, Kreische M, Ishida K, Liaimer A, Altermark B, Bähr L, Hertweck C, Ehwald R, Dittmann E (2017) High-density cultivation of terrestrial Nostoc strains leads to reprogramming of secondary metabolome. *Appl Environ Microbiol*,

Marion A, Groll M, Scharf DH, Scherlach K, Glaser M, Sievers H, Schuster M, Hertweck C, Brakhage AA, Antes I, Huber EM (2017) Gliotoxin Biosynthesis: Structure, Mechanism, and Metal Promiscuity of Carboxypeptidase GliJ. *ACS Chem Biol* 12(7), 1874-1882.

Molloy EM, Hertweck C (2017) Antimicrobial discovery inspired by ecological interactions. *Curr Opin Microbiol* 39, 121-127.

Polke M, Sprenger M, Scherlach K, Albán-Proaño MC, Martin R, Hertweck C, Hube B, Jacobsen ID (2017) A functional link between hyphal maintenance and quorum sensing in *Candida albicans*. *Mol Microbiol* 103(4), 595-617.

Shao Y, Chen B, Sun C, Ishida K, Hertweck C, Boland W (2017) Symbiont-Derived Antimicrobials Contribute to the Control of the Lepidopteran Gut Microbiota. *Cell Chem Biol* 24(1), 66-75.

Valiante V, Mattern DJ, Schüffler A, Horn F, Walther G, Scherlach K, Petzke L, Dickhaut J, Guthke R, Hertweck C, Nett M, Thines E, Brakhage AA (2017) Discovery of an Extended Austinoid Biosynthetic Pathway in *Aspergillus calidoustus*. *ACS Chem Biol* 12(5), 1227-1234.

Barnes EC, Jumpathong J, Lumyong S, Voigt K, Hertweck C (2016) Daldionin, an unprecedented binaphthyl derivative, and diverse polyketide congeners from a fungal orchid endophyte. *Chemistry* 22(13), 4551-4555.

Chankhamjon P, Tsunematsu Y, Ishida-Ito M, Sasa Y, Meyer F, Boettger-Schmidt D, Urbansky B, Menzel KD, Scherlach K, Watanabe K, Hertweck C (2016) Regioselective Dichlorination of a Non-Activated Aliphatic Carbon Atom and Phenolic Bismethylation by a Multifunctional Fungal Flavoenzyme. *Angew Chem Int Ed* 55(39), 11955-11959.

De Felice A, Di Lorenzo F, Scherlach K, Ross C, Silipo A, Hertweck C, Molinaro A (2016) Structural investigation of the lipopolysaccharide O-chain isolated from *Burkholderia fungorum*

strain DSM 17061. *Carbohydr Res* 433, 31-35.

De Felice A, Silipo A, Scherlach K, Ross C, Hertweck C, Molinaro A (2016) Structural and conformational study of the O-antigenic portion of the Lipopolysaccharide isolated from *Burkholderia gladioli* pv. *cocovenenans*. *Eur J Org Chem* 4, 748-755.

Dolatabadi S, Scherlach K, Figge M, Hertweck C, Dijksterhuis J, Menken SB, de Hoog GS (2016) Food preparation with mucoralean fungi: A potential biosafety issue? *Fungal Biol* 120(3), 393-401.

Franke J, Hertweck C (2016) Biomimetic Thioesters as Probes for Enzymatic Assembly Lines: Synthesis, Applications, and Challenges. *Cell Chem Biol* 23(10), 1179-1192. (Review)

Geib E, Gressler M, Viediarnikova I, Hillmann F, Jacobsen ID, Nietzsche S, Hertweck C, Brock M (2016) A non-canonical melanin biosynthesis pathway protects *Aspergillus terreus* conidia from environmental stress. *Cell Chem Biol* 23(5), 587-597.

Guo H, Kreuzenbeck NB, Otani S, Garcia-Altare M, Dahse HM, Weigel C, Aanen DK, Hertweck C, Poulsen M, Beemelmans C (2016) Pseudoxylallemycins A-F, cyclic tetrapeptides with rare allenyl modifications isolated from *Pseudoxylaria* sp. X802: A competitor of fungus-growing termite cultivars. *Org Lett* 18, 3338-3341.

Heine D, Sundaram S, Beudert M, Martin K, Hertweck C (2016) A widespread bacterial phenazine forms conjugates with biogenic thiols and crosslinks proteins. *Chem Sci* 7, 4848-4855.

Kostic M, Crews CM, Hertweck C, Shokat K, Suga H (2016) Our Advisors, Our Ambassadors, Our Editorial Board Members. *Cell Chem Biol* 23(3), 311-312. (Review)

Kostic M, Crews CM, Hertweck C, Shokat K, Suga H (2016) Cell Chemical Biology: Home of Exciting Chemical Biology. *Cell Chem Biol* 23(1), 1-2. (Review)

Kostic M, Crews CM, Hertweck C, Shokat K, Suga H (2016) Voices of Chemical Biology: Charting the Next Decade. *Cell Chem Biol* 23(2), 199. (Review)

Sun Y, Meng Z, Chen P, Zhang D, Baunach M, Hertweck C, Li A (2016) A concise total synthesis of sespenine, a structurally unusual indole terpenoid from *Streptomyces*. *Org Chem Front* 3, 368-374.

Sundaram S, Hertweck C (2016) On-line enzymatic tailoring of polyketides and peptides in thiotemplate systems. *Curr Opin Chem Biol* 31, 82-94. (Review)

Ueberschaar N, Heine D, Hertweck C (2016) Zinc(II)-Assisted Aryl-Finkelstein-Reaction for the Synthesis of Aryl Iodides. *Synlett* 27, 1794-1797.

Ueberschaar N, Meyer F, Dahse HM, Hertweck C (2016) Bipiperidine conjugates as soluble sugar surrogates in DNA-intercalating antiproliferative polyketides. *Chem Commun (Camb)* 52(27), 4894-4897.

Walther E, Boldt S, Kage H, Lauterbach T, Martin K, Roth M, Hertweck C, Sauerbrei A, Schmidtke M, Nett M (2016) Zincophorin – biosynthesis in *Streptomyces griseus* and antibiotic properties *GMS Infect Dis* 4, Doc08.

- Wick J, Heine D, Lackner G, Misiak M, Tauber J, Jagusch H, Hertweck C, Hoffmeister D (2016) A fivefold parallelized biosynthetic process secures chlorination of *Armillaria mellea* (honey mushroom) toxins. *Appl Environ Microbiol* 82, 1196-1204.
- Barnes EC, Bezerra-Gomes P, Nett M, Hertweck C (2015) Dandamycin and chandrananimycin E, benzoxazines from *Streptomyces griseus*. *J Antibiot (Tokyo)* 68, 463-468.
- Baunach M, Ding L, Willing K, Hertweck C (2015) Bacterial synthesis of unusual sulfonamide and sulfone antibiotics by flavoenzyme-mediated sulfur dioxide capture. *Angew Chem Int Ed Engl.* 54(45), 13279-13283.
- Baunach M, Franke J, Hertweck C (2015) Terpenoid biosynthesis off the beaten track: unconventional cyclases and their impact on biomimetic synthesis. *Angew. Chem. Int. Ed.* 54(9), 2604-2626.
- Baunach M, Hertweck C (2015) Natural 1,3-Dipolar Cycloadditions. *Angew Chem Int Ed Engl.* 54(43), 12550-12552. (Review)
- Braesel J, Götze S, Shah F, Heine D, Tauber J, Hertweck C, Tunlid A, Stallforth P, Hoffmeister D (2015) Three redundant synthetases secure redox-active pigment production in the basidiomycete *Paxillus involutus*. *Chem Biol* 22, 1325-1334.
- Chiriac AI, Kloss F, Krämer J, Vuong C, Hertweck C, Sahl HG (2015) Mode of action of closthioamide: the first member of the polythioamide class of bacterial DNA gyrase inhibitors. *J Antimicrob Chemother* 70(9), 2576-2588.
- Ding L, Franke J, Hertweck C (2015) Divergolide congeners illuminate alternative reaction channels for ansamycin diversification. *Org. Biomol. Chem.* 13(6), 1618-1623.
- Ding L, Goerls H, Dornblut K, Lin W, Maier A, Fiebig HH, Hertweck C (2015) Bacaryolanes A-C, rare bacterial caryolanes from a mangrove endophyte. *J Nat Prod.* 78(12), 2963-2967.
- Franke J, Ishida K, Hertweck C (2015) Plasticity of the Malleobactin Pathway and its Impact on Siderophore Action in Human Pathogenic Bacteria. *Chemistry* 21(22), 8010-8014.
- Graupner K, Lackner G, Hertweck C (2015) Genome Sequence of Mushroom Soft-Rot Pathogen *Janthinobacterium agaricidamnosum*. *Genome Announc.* 3(2), pii: e00277-15.
- Gressler M, Meyer F, Heine D, Hortschansky P, Hertweck C, Brock M (2015) Phytotoxin production in *Aspergillus terreus* is regulated by independent environmental signals. *eLife* 4, e07861.
- Heine D, Sundaram S, Bretschneider T, Hertweck C (2015) Twofold polyketide branching by a stereoselective enzymatic Michael addition *Chem Commun (Camb).* 51(48), 9872-9875.
- Hertweck C (2015) Natural Products as Source of Therapeutics against Parasitic Diseases. *Angew Chem Int Ed Engl.* 54(49), 14622-14624. (Review)
- Hertweck C (2015) Decoding and reprogramming complex polyketide assembly lines: prospects for synthetic biology. *Trends Biochem Sci.* 40(4), 189-199. (Review)
- Horn F, Habel A, Scharf DH, Dworschak J, Brakhage AA, Guthke R, Hertweck C, Linde J (2015)

Draft Genome Sequence and Gene Annotation of the Entomopathogenic Fungus *Verticillium hemipterigenum*. *Genome Announc* 3(1), e01439-14.

Horn F, Üzüm Z, Möbius N, Guthke R, Linde J, Hertweck C (2015) Draft Genome Sequences of Symbiotic and Nonsymbiotic *Rhizopus microsporus* Strains CBS 344.29 and ATCC 62417. *Genome Announc* 3(1), pii: e01370-14.

Leonhardt I, Spielberg S, Weber M, Albrecht-Eckardt D, Bläss M, Claus R, Barz D, Scherlach K, Hertweck C, Löffler J, Hünninger K, Kurzai O (2015) The fungal quorum-sensing molecule farnesol activates innate immune cells but suppresses cellular adaptive immunity. *MBio* 6(2), e00143.

Liaimer A, Helfrich EJ, Hinrichs K, Guljamow A, Ishida K, Hertweck C, Dittmann E (2015) Nostopeptolide plays a governing role during cellular differentiation of the symbiotic cyanobacterium *Nostoc punctiforme*. *Proc Natl Acad Sci U S A* 112(6), 1862-1867.

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.

Medema MH, Kottmann R, Yilmaz P, Cummings M, Biggins JB, Blin K, de Bruijn I, Chooi YH, Claesen J, Coates RC, Cruz-Morales P, Duddela S, Düsterhus S, Edwards DJ, Fewer DP, Garg N, Geiger C, Gomez-Escribano JP, Greule A, Hadjithomas M, Haines AS, Helfrich EJ, Hillwig ML, Ishida K, Jones AC, Jones CS, Jungmann K, Kegler C, Kim HU, Kötter P, Krug D, Masschelein J, Melnik AV, Mantovani SM, Monroe EA, Moore M, Moss N, Nützmann HW, Pan G, Pati A, Petras D, Reen FJ, Rosconi F, Rui Z, Tian Z, Tobias NJ, Tsunematsu Y, Wiemann P, Wyckoff E, Yan X, Yim G, Yu F, Xie Y, Aigle B, Apel AK, Balibar CJ, Balskus EP, Barona-Gómez F, Bechthold A, Bode HB, Borriss R, Brady SF, Brakhage AA, Caffrey P, Cheng YQ, Clardy J, Cox RJ, De Mot R, Donadio S, Donia MS, van der Donk WA, Dorrestein PC, Doyle S, Driessen AJ, Ehling-Schulz M, Entian KD, Fischbach MA, Gerwick L, Gerwick WH, Gross H, Gust B, Hertweck C, Höfte M, Jensen SE, Ju J, Katz L, Kaysser L, Klassen JL, Keller NP, Kormanec J, Kuipers OP, Kuzuyama T, Kyrpides NC, Kwon HJ, Lautru S, Lavigne R, Lee CY, Linquan B, Liu X, Liu W, Luzhetskyy A, Mahmud T, Mast Y, Méndez C, Metsä-Ketelä M, Micklefield J, Mitchell DA, Moore BS, Moreira LM, Müller R, Neilan BA, Nett M, Nielsen J, O'Gara F, Oikawa H, Osbourn A, Osburne MS, Ostash B, Payne SM, Pernodet JL, Petricek M, Piel J, Ploux O, Raaijmakers JM, Salas JA, Schmitt EK, Scott B, Seipke RF, Shen B, Sherman DH, Sivonen K, Smanski MJ, Sosio M, Stegmann E, Süßmuth RD, Tahlan K, Thomas CM, Tang Y, Truman AW, Viaud M, Walton JD, Walsh CT, Weber T, van Wezel GP, Wilkinson B, Willey JM, Wohlleben W, Wright GD, Ziemert N, Zhang C, Zotchev SB, Breitling R, Takano E, Glöckner FO (2015) Minimum information about a biosynthetic gene cluster. *Nat Chem Biol* 11, 625-631.

Shabuer G, Ishida K, Pidot SJ, Roth M, Dahse HM, Hertweck C (2015) Plant pathogenic anaerobic bacteria use aromatic polyketides to access aerobic territory. *Science* 350(6261), 670-674.

Sugimoto Y, Ishida K, Traitcheva N, Busch B, Dahse HM, Hertweck C (2015) Freedom and constraint in engineered noncolinear polyketide assembly lines *Chem Biol* 22(2), 229-240.

Sundaram S, Heine D, Hertweck C (2015) Polyketide synthase chimeras reveal key role of ketosynthase domain in chain branching *Nat Chem Biol*. 11(12), 949-951.

Uzum Z, Silipo A, Lackner G, De Felice A, Molinaro A, Hertweck C (2015) Structure, Genetics and

Function of an Exopolysaccharide Produced by a Bacterium Living within Fungal Hyphae. *Chembiochem* 16(3), 387-392.

Zocher G, Vilstrup J, Heine D, Hallab A, Goralski E, Hertweck C, Stahl M, Schäberle TF, Stehle T (2015) Structural basis of head to head polyketide fusion by CorB. *Chem Sci* 6(11), 6525-6536.

Cai X, Ng K, Panesar H, Moon SJ, Paredes M, Ishida K, Hertweck C, Minehan TG (2014) Total synthesis of the antitumor natural product polycarcin V and evaluation of its DNA binding profile. *Org Lett* 16(11), 2962-2965.

Chankhamjon P, Boettger-Schmidt D, Scherlach K, Urbansky B, Lackner G, Kalb D, Dahse HM, Hoffmeister D, Hertweck C (2014) Biosynthesis of the Halogenated Mycotoxin Aspirochlorine in Koji Mold Involves a Cryptic Amino Acid Conversion. *Angew Chem Int Ed Engl* 53, 13409-13413.

Coyne S, Litomska A, Chizzali C, Khalil MN, Richter K, Beerhues L, Hertweck C (2014) Control of plant defense mechanisms and fire blight pathogenesis through the regulation of 6-thioguanine biosynthesis in *Erwinia amylovora*. *Chembiochem* 15(3), 373-376.

Crews C, Hertweck C, Shokat K, Suga H, Kostic M (2014) Reflecting on the past and looking forward to the future of bridging chemistry and biology. *Chem Biol* 21(9), 1035-1036.

Franke J, Ishida K, Hertweck C (2014) Evolution of siderophore pathways in human pathogenic bacteria. *J Am Chem Soc* 136(15), 5599-5602.

Gatte-Picchi D, Weiz A, Ishida K, Hertweck C, Dittmann E (2014) Functional analysis of environmental DNA-derived microviridins provides new insights into the diversity of the tricyclic peptide family. *Appl Environ Microbiol* 80(4), 1380-1387.

Heine D, Bretschneider T, Sundaram S, Hertweck C (2014) Enzymatic Polyketide Chain Branching to Give Substituted Lactone, Lactam, and Glutarimide Heterocycles. *Angew Chem Int Ed Engl* 53(43), 11645-11649.

Heine D, Martin K, Hertweck C (2014) Genomics-guided discovery of endophenazines from *Kitasatospora* sp. HKI 714. *J Nat Prod* 77(4), 1083-1087.

Jaschinski T, Helfrich EJ, Bock C, Wolfram S, Svatoš A, Hertweck C, Pohnert G (2014) Matrix-free single-cell LDI-MS investigations of the diatoms *Coscinodiscus granii* and *Thalassiosira pseudonana*. *J Mass Spectrom* 49(2), 136-144.

Kloss F, Chiriac AI, Hertweck C (2014) Mapping of the modular closthoamide architecture reveals crucial motifs of polythioamide antibiotics. *Chemistry* 20(47), 15451-15458.

Letzel AC, Pidot SJ, Hertweck C (2014) Genome mining for ribosomally synthesized and post-translationally modified peptides (RiPPs) in anaerobic bacteria. *BMC Genomics* 15, 983.

Moebius N, Uzüm Z, Dijksterhuis J, Lackner G, Hertweck C (2014) Active invasion of bacteria into living fungal cells. *Elife*, e03007.

Mohan S, Hertweck C, Dudda A, Hammerschmidt S, Skerka C, Hallström T, Zipfel PF (2014) Tuf of *Streptococcus pneumoniae* is a surface displayed human complement regulator binding protein. *Mol Immunol* 62(1), 249-264.

- Pidot S, Ishida K, Cyrulies M, Hertweck C (2014) Discovery of clostrubin, an exceptional polyphenolic polyketide antibiotic from a strictly anaerobic bacterium. *Angew Chem Int Ed Engl* 53(30), 7856-7859.
- Pidot SJ, Coyne S, Kloß F, Hertweck C (2014) Antibiotics from neglected bacterial sources. *Int J Med Microbiol* 304(1), 14-22.
- Ross C, Opel V, Scherlach K, Hertweck C (2014) Biosynthesis of antifungal and antibacterial polyketides by *Burkholderia gladioli* in coculture with *Rhizopus microsporus*. *Mycoses* 57, 48-55.
- Ross C, Scherlach K, Kloss F, Hertweck C (2014) The molecular basis of conjugated polyene biosynthesis in phytopathogenic bacteria. *Angew Chem Int Ed Engl* 53(30), 7794-7798.
- 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 Engl* 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.
- Sugimoto Y, Ding L, Ishida K, Hertweck C (2014) Rational design of modular polyketide synthases: morphing the aureothin pathway into a luteoreticulic acid assembly line. *Angew Chem Int Ed Engl* 53(6), 1560-1564.
- Sun Y, Chen P, Zhang D, Baunach M, Hertweck C, Li A (2014) Bioinspired total synthesis of sespenine. *Angew Chem Int Ed Engl* 53(34), 9012-9016.
- Weiz AR, Ishida K, Quitterer F, Meyer S, Kehr JC, Müller KM, Groll M, Hertweck C, Dittmann E (2014) Harnessing the evolvability of tricyclic microviridins to dissect protease-inhibitor interactions. *Angew Chem Int Ed Engl* 53(14), 3735-3738.
- Xu Z, Baunach M, Ding L, Peng H, Franke J, Hertweck C (2014) Biosynthetic code for divergolide assembly in a bacterial mangrove endophyte. *Chembiochem* 15(9), 1274-1279.
- Zaehle C, Gressler M, Shelest E, Geib E, Hertweck C, Brock M (2014) Terrestrial Biosynthesis in *Aspergillus terreus* and Its Impact on Phytotoxicity. *Chem Biol* 21(6), 719-731.
- Arnison PG, Bibb MJ, Bierbaum G, Bowers AA, Bugni TS, Bulaj G, Camarero JA, Campopiano DJ, Challis GL, Clardy J, Cotter PD, Craik DJ, Dawson M, Dittmann E, Donadio S, Dorrestein PC, Entian KD, Fischbach MA, Garavelli JS, Göransson U, Gruber CW, Haft DH, Hemscheidt TK, Hertweck C, Hill C, Horswill AR, Jaspars M, Kelly WL, Klinman JP, Kuipers OP, Link AJ, Liu W, Marahiel MA, Mitchell DA, Moll GN, Moore BS, Müller R, Nair SK, Nes IF, Norris GE, Olivera BM, Onaka H, Patchett ML, Piel J, Reaney MJ, Rebuffat S, Ross RP, Sahl HG, Schmidt EW, Selsted ME, Severinov K, Shen B, Sivonen K, Smith L, Stein T, Süßmuth RD, Tagg JR, Tang GL, Truman AW, Vederas JC, Walsh CT, Walton JD, Wenzel SC, Willey JM, van der Donk WA (2013) Ribosomally synthesized and post-translationally modified peptide natural products: overview and recommendations for a universal nomenclature. *Nat Prod Rep* 30(1), 108-160.
- Baunach M, Ding L, Bruhn T, Bringmann G, Hertweck C (2013) Regiodivergent N-C and N-N aryl coupling reactions of indoloterpenes and cycloether formation mediated by a single bacterial flavoenzyme. *Angew Chem Int Ed Engl* 52(34), 9040-9043.



Boettger D, Hertweck C (2013) Molecular diversity sculpted by fungal PKS-NRPS hybrids. *Chembiochem* 14(1), 28-42.

Bretschneider T, Heim JB, Heine D, Winkler R, Busch B, Kusebauch B, Stehle T, Zocher G, Hertweck C (2013) Vinylogous chain branching catalysed by a dedicated polyketide synthase module. *Nature* 502(7469), 124-128.

Coyne S, Chizzali C, Khalil MN, Litomska A, Richter K, Beerhues L, Hertweck C. (2013) Biosynthesis of the antimetabolite 6-thioguanine in *Erwinia amylovora* plays a key role in fire blight pathogenesis. *Angew Chem Int Ed Engl.* 52(40), 10564-10568.

Franke J, Ishida K, Ishida-Ito M, Hertweck C (2013) Nitro versus hydroxamate in siderophores of pathogenic bacteria: effect of missing hydroxylamine protection in malleobactin biosynthesis. *Angew Chem Int Ed Engl* 52(32), 8271-8275.

Grumbt M, Monod M, Yamada T, Hertweck C, Kunert J, Staib P (2013) Keratin degradation by dermatophytes relies on cysteine dioxygenase and a sulfite efflux pump. *J Invest Dermatol* 133(6), 1550-1555.

Hennicke F, Grumbt M, Lermann U, Ueberschaar N, Palige K, Böttcher B, Jacobsen ID, Staib C, Morschhäuser J, Monod M, Hube B, Hertweck C, Staib P (2013) Factors supporting cysteine tolerance and sulfite production in *Candida albicans*. *Eukaryot Cell* 12(4), 604-613.

König CC, Scherlach K, Schroeckh V, Horn F, Nietzsche S, Brakhage AA, Hertweck C (2013) Bacterium induces cryptic meroterpenoid pathway in the pathogenic fungus *Aspergillus fumigatus*. *Chembiochem* 14(8), 938-942.

Letzel AC, Pidot SJ, Hertweck C (2013) A genomic approach to the cryptic secondary metabolome of the anaerobic world. *Nat Prod Rep* 30(3), 392-428.

Mayeku PW, Hassanali A, Kiremire BT, Odalo JO, Hertweck C (2013) Anti-bacterial activities and phytochemical screening of extracts of different parts of *Thalictrum rhynchocarpum*. *Afr J Tradit Complement Altern Med* 10(5), 341-344.

Meyer F, Ueberschaar N, Dahse HM, Hertweck C (2013) Synthesis and biological evaluation of hydrazidomycin analogues. *Bioorg Med Chem Lett* 23(22), 6043-6045.

Meyer F, Ueberschaar N, Hertweck C (2013) Concise Total Synthesis of Hydrazidomycin A, a Rare Hydrazide Metabolite of *Streptomyces atratus* *Eur. J. Org. Chem* , 4242-4244.

Nützmann HW, Fischer J, Scherlach K, Hertweck C, Brakhage AA (2013) Distinct amino acids of histone H3 control secondary metabolism in *Aspergillus nidulans*. *Appl Environ Microbiol* 79(19), 6102-6109.

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.

Scherlach K, Graupner K, Hertweck C (2013) Molecular bacteria-fungi interactions: effects on environment, food, and medicine. *Annu Rev Microbiol* 67, 375-397.

Scherlach K, Lackner G, Graupner K, Pidot S, Bretschneider T, Hertweck C (2013) Biosynthesis

and mass spectrometric imaging of tolaasin, the virulence factor of brown blotch mushroom disease. *Chembiochem* 14(18), 2439-2443.

Ueberschaar N, Dahse HM, Bretschneider T, Hertweck C (2013) Rational design of an apoptosis-inducing photoreactive DNA intercalator. *Angew Chem Int Ed Engl* 52(24), 6185-6189.

Ueberschaar N, Xu Z, Scherlach K, Metsä-Ketelä M, Bretschneider T, Dahse HM, Görls H, Hertweck C (2013) Synthetic remodeling of the chartreusin pathway to tune antiproliferative and antibacterial activities. *J Am Chem Soc* 135(46), 17408-17416.

Behnken S, Hertweck C (2012) Anaerobic bacteria as producers of antibiotics. *Appl Microbiol Biotechnol* 96(1), 61-67.

Behnken S, Hertweck C (2012) Cryptic polyketide synthase genes in non-pathogenic *Clostridium* SPP. *PLOS One* 7(1), e29609.

Behnken S, Lincke T, Kloss F, Ishida K, Hertweck C (2012) Antiterminator-mediated unveiling of cryptic polythioamides in an anaerobic bacterium. *Angew Chem Int Ed Engl* 51(10), 2425-2428.

Bretschneider T, Zocher G, Unger M, Scherlach K, Stehle T, Hertweck C (2012) A ketosynthase homolog uses malonyl units to form esters in cervimycin biosynthesis. *Nat Chem Biol* 8(2), 154-161.

Ding L, Dahse HM, Hertweck C (2012) Cytotoxic alkaloids from *Fusarium incarnatum* associated with the mangrove tree *Aegiceras corniculatum*. *J Nat Prod* 75(4), 617-621.

Henrot M, Richter ME, Maddaluno J, Hertweck C, De Paolis M (2012) Convergent asymmetric synthesis of (+)-aureothin employing an oxygenase-mediated resolution step. *Angew Chem Int Ed Engl* 51(38), 9587-9591.

Ishida K, Lincke T, Hertweck C (2012) Assembly and absolute configuration of short-lived polyketides from *Burkholderia thailandensis*. *Angew Chem Int Ed Engl* 51(22), 5470-5474.

Jensen K, Niederkrüger H, Zimmermann K, Vagstad AL, Moldenhauer J, Brendel N, Frank S, Pöplau P, Kohlhaas C, Townsend CA, Oldiges M, Hertweck C, Piel J (2012) Polyketide proofreading by an acyltransferase-like enzyme. *Chem Biol* 19(3), 329-339.

Kusari S, Hertweck C, Spiteller M (2012) Chemical ecology of endophytic fungi: origins of secondary metabolites. *Chem Biol* 19(7), 792-798.

Moebius N, Ross C, Scherlach K, Rohm B, Roth M, Hertweck C (2012) Biosynthesis of the respiratory toxin bongkrekic acid in the pathogenic bacterium *Burkholderia gladioli*. *Chem Biol* 19(9), 1164-1174.

Richter M, Busch B, Ishida K, Moore BS, Hertweck C (2012) Pyran formation by an atypical CYP-mediated four-electron oxygenation-cyclization cascade in an engineered aureothin pathway. *Chembiochem* 13(15), 2196-2199.

Sarkar A, Funk AN, Scherlach K, Horn F, Schroeckh V, Chankhamjon P, Westermann M, Roth M, Brakhage AA, Hertweck C, Horn U (2012) Differential expression of silent polyketide biosynthesis gene clusters in chemostat cultures of *Aspergillus nidulans*. *J Biotechnol* 160(1-2), 64-71.

- Sasso S, Pohnert G, Lohr M, Mittag M, Hertweck C (2012) Microalgae in the postgenomic era: a blooming reservoir for new natural products. *FEMS Microbiol Rev* 36(4), 761-785.
- Scharf DH, Chankhamjon P, Scherlach K, Heinekamp T, Roth M, Brakhage AA, Hertweck C (2012) Epidithiol 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.
- Scherlach K, Brendel N, Ishida K, Dahse HM, Hertweck C (2012) Photochemical oxazole-nitrile conversion downstream of rhizoxin biosynthesis and its impact on antimitotic activity. *Org Biomol Chem* 10(30), 5756-5759.
- Scherlach K, Busch B, Lackner G, Paszkowski U, Hertweck C (2012) Symbiotic cooperation in the biosynthesis of a phytotoxin. *Angew Chem Int Ed Engl* 51(38), 9615-9618.
- Silipo A, Leone MR, Lanzetta R, Parrilli M, Lackner G, Busch B, Hertweck C, Molinaro A (2012) Structural characterization of two lipopolysaccharide O-antigens produced by the endofungal bacterium *Burkholderia* sp. HKI-402 (B4). *Carbohydr Res* 347(1), 95-98.
- Burmester A, Shelest E, Glöckner G, Heddergott C, Schindler S, Staib P, Heidel A, Felder M, Petzold A, Szafranski K, Feuermann M, Pedruzzi I, Priebe S, Groth M, Winkler R, Li W, Kniemeyer O, Schroeckh V, Hertweck C, Hube B, White TC, Platzer M, Guthke R, Heitman J, Wöstemeyer J, Zipfel PF, Monod M, Brakhage AA (2011) Comparative and functional genomics provide insights into the pathogenicity of dermatophytic fungi. *Genome Biol* 12(1), R7.
- Ding L, Maier A, Fiebig HH, Görls H, Lin WH, Peschel G, Hertweck C (2011) Divergolides A-D from a mangrove endophyte reveal an unparalleled plasticity in ansa-macrolide biosynthesis. *Angew Chem Int Ed Engl* 50(7), 1630-1634.
- Ding L, Maier A, Fiebig HH, Lin WH, Hertweck C (2011) A family of multicyclic indolosesquiterpenes from a bacterial endophyte. *Org Biomol Chem* 9(11), 4029-4031.
- Fries A, Bretschneider T, Winkler R, Hertweck C (2011) A ribonucleotide reductase-like electron transfer system in the nitroaryl-forming N-oxygenase AurF. *Chembiochem* 12(12), 1832-1835.
- Gee JE, Glass MB, Lackner G, Helsel LO, Daneshvar M, Hollis DG, Jordan J, Morey R, Steigerwalt A, Hertweck C (2011) Characterization of *Burkholderia rhizoxinica* and *B. endofungorum* isolated from clinical specimens. *PLOS One* 6(1), e15731.
- Gressler M, Zaehle C, Scherlach K, Hertweck C, Brock M (2011) Multifactorial induction of an orphan PKS-NRPS gene cluster in *Aspergillus terreus*. *Chem Biol* 18(2), 198-209.
- Hertweck C (2011) Biosynthesis and charging of pyrrolysine, the 22nd genetically encoded amino acid. *Angew Chem Int Ed Engl* 50(41), 9540-9541.
- 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.

- Kusebauch B, Brendel N, Kirchner H, Dahse HM, Hertweck C (2011) Assessing oxazole bioisosteres as mutasynthons on the rhizoxin assembly line. *ChemBiochem* 12(15), 2284-2288.
- Kusebauch B, Scherlach K, Kirchner H, Dahse HM, Hertweck C (2011) Antiproliferative effects of ester- and amide-functionalized rhizoxin derivatives. *ChemMedChem* 6(11), 1998-2001.
- Lackner G, Hertweck C (2011) Impact of endofungal bacteria on infection biology, food safety, and drug development. *PLOS Pathog* 7(6), e1002096.
- Lackner G, Moebius N, Hertweck C (2011) Endofungal bacterium controls its host by an hrp type III secretion system. *ISME J* 5(2), 252-261.
- Lackner G, Moebius N, Partida-Martinez L, Hertweck C (2011) Complete genome sequence of *Burkholderia rhizoxinica*, an endosymbiont of *Rhizopus microsporus*. *J Bacteriol* 193(3), 783-784.
- Lackner G, Moebius N, Partida-Martinez LP, Boland S, Hertweck C (2011) Evolution of an endofungal lifestyle: Deductions from the *Burkholderia rhizoxinica* genome. *BMC Genomics* 12, 210.
- Liaimer A, Jenke-Kodama H, Ishida K, Hinrichs K, Stangeland J, Hertweck C, Dittmann E (2011) A polyketide interferes with cellular differentiation in the symbiotic cyanobacterium *Nostoc punctiforme*. *Environ Microbiol Rep* 3(5), 550-558.
- Nett M, Hertweck C (2011) Farinamycin, a quinazoline from *Streptomyces griseus*. *J Nat Prod* 74(10), 2265-2268.
- Nützmann HW, Reyes-Dominguez Y, Scherlach K, Schroeckh V, Horn F, Gacek A, Schümann J, Hertweck C, Strauss J, Brakhage AA (2011) Bacteria-induced natural product formation in the fungus *Aspergillus nidulans* requires Saga/Ada-mediated histone acetylation. *Proc Natl Acad Sci U S A* 108(34), 14282-14287.
- Regueira TB, Kildegaard KR, Hansen BG, Mortensen UH, Hertweck C, Nielsen J (2011) Molecular basis for mycophenolic acid biosynthesis in *Penicillium brevicompactum*. *Appl Environ Microbiol* 77(9), 3035-3043.
- 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.
- Scherlach K, Nützmann HW, Schroeckh V, Dahse HM, Brakhage AA, Hertweck C (2011) Cytotoxic pheofungins from an engineered fungus impaired in posttranslational protein modification. *Angew Chem Int Ed* 50(42), 9843-9847.
- Scherlach K, Sarkar A, Schroeckh V, Dahse HM, Roth M, Brakhage AA, Horn U, Hertweck C (2011) Two induced fungal polyketide pathways converge into antiproliferative spiroanthrones. *ChemBiochem* 12(12), 1836-1839.
- Ueberschaar N, Ndejoung Ble S, Ding L, Maier A, Fiebig HH, Hertweck C (2011) Hydrazidomycins, cytotoxic alkyhydrazides from *Streptomyces atratus*. *Bioorg Med Chem Lett* 21(19), 5839-5841.

- Vödisch M, Scherlach K, Winkler R, Hertweck C, Braun HP, Roth M, Haas H, Werner ER, Brakhage AA, Kniemeyer O (2011) Analysis of the *Aspergillus fumigatus* proteome reveals metabolic changes and the activation of the pseurotin A biosynthesis gene cluster in response to hypoxia. *J Proteome Res* 10(5), 2508-2524.
- Weiz AR, Ishida K, Makower K, Ziemert N, Hertweck C, Dittmann E (2011) Leader peptide and a membrane protein scaffold guide the biosynthesis of the tricyclic peptide microviridin. *Chem Biol* 18(11), 1413-1421.
- Winter JM, Behnken S, Hertweck C (2011) Genomics-inspired discovery of natural products. *Curr Opin Chem Biol* 15(1), 22-31.
- Xu Z, Ding L, Hertweck C (2011) A branched extender unit shared between two orthogonal polyketide pathways in an endophyte. *Angew Chem Int Ed Engl* 50(20), 4667-4670.
- Zocher G, Richter ME, Müller U, Hertweck C (2011) Structural fine-tuning of a multifunctional cytochrome P450 monooxygenase. *J Am Chem Soc* 133(7), 2292-2302.
- Abdou R, Scherlach K, Dahse HM, Sattler I, Hertweck C (2010) Botryorhodines A-D, antifungal and cytotoxic depsidones from *Botryosphaeria rhodina*, an endophyte of the medicinal plant *Bidens pilosa*. *Phytochemistry* 71(1), 110-116.
- Bergmann S, Funk AN, Scherlach K, Schroeckh V, Shelest E, Horn U, Hertweck C, Brakhage AA (2010) Activation of a silent fungal polyketide biosynthesis pathway through regulatory cross talk with a cryptic nonribosomal peptide synthetase gene cluster. *Appl Environ Microbiol* 76(24), 8143-8149.
- Bruns S, Seidler M, Albrecht D, Salvenmoser S, Remme N, Hertweck C, Brakhage AA, Kniemeyer O, Müller FM (2010) Functional genomic profiling of *Aspergillus fumigatus* biofilm reveals enhanced production of the mycotoxin gliotoxin. *Proteomics* 10(17), 3097-3107.
- Ding L, Münch J, Goerls H, Maier A, Fiebig HH, Lin WH, Hertweck C (2010) Xiamycin, a pentacyclic indolosesquiterpene with selective anti-HIV activity from a bacterial mangrove endophyte. *Bioorg Med Chem Lett* 20(22), 6685-6687.
- Gomes PB, Nett M, Dahse HM, Hertweck C (2010) Pitucamycin: structural merger of a phenoxazinone with an epoxyquinone antibiotic. *J Nat Prod* 73(9), 1461-1464.
- Ishida K, Lincke T, Behnken S, Hertweck C (2010) Induced biosynthesis of cryptic polyketide metabolites in a *Burkholderia thailandensis* quorum sensing mutant. *J Am Chem Soc* 132(40), 13966-13968.
- Kroiss J, Kaltenpoth M, Schneider B, Schwinger MG, Hertweck C, Maddula RK, Strohm E, Svatos A (2010) Symbiotic Streptomycetes provide antibiotic combination prophylaxis for wasp offspring. *Nat Chem Biol* 6(4), 261-263.
- Krügel H, Licht A, Biedermann G, Petzold A, Lassak J, Hupfer Y, Schlott B, Hertweck C, Platzer M, Brantl S, Saluz HP (2010) Cervimycin C resistance in *Bacillus subtilis* is due to a promoter up-mutation and increased mRNA stability of the constitutive ABC-transporter gene *bmrA*. *FEMS Microbiol Lett* 313(2), 155-163.
- Kusebauch B, Busch B, Scherlach K, Roth M, Hertweck C (2010) Functionally distinct modules

operate two consecutive alpha,beta-->beta,gamma double-bond shifts in the rhizoxin polyketide assembly line. *Angew Chem Int Ed Engl* 49(8), 1460-1464.

Leone MR, Lackner G, Silipo A, Lanzetta R, Molinaro A, Hertweck C (2010) An unusual galactofuranose lipopolysaccharide that ensures the intracellular survival of toxin-producing bacteria in their fungal host. *Angew Chem Int Ed Engl* 49(41), 7476-7480.

Lincke T, Behnken S, Ishida K, Roth M, Hertweck C (2010) Closthioamide: an unprecedented polythioamide antibiotic from the strictly anaerobic bacterium *Clostridium cellulolyticum*. *Angew Chem Int Ed Engl* 49(11), 2011-2013.

Rohm B, Scherlach K, Hertweck C (2010) Biosynthesis of the mitochondrial adenine nucleotide translocase (ATPase) inhibitor bongkreikic acid in *Burkholderia gladioli*. *Org Biomol Chem* 8(7), 1520-1522.

Rohm B, Scherlach K, Möbius N, Partida-Martinez LP, Hertweck C (2010) Toxin production by bacterial endosymbionts of a *Rhizopus microsporus* strain used for tempe/sufu processing. *Int J Food Microbiol* 136(3), 368-371.

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.

Scherlach K, Boettger D, Remme N, Hertweck C (2010) The chemistry and biology of cytochalasans. *Nat Prod Rep* 27(6), 869-886.

Scherlach K, Schuemann J, Dahse HM, Hertweck C (2010) Aspernidine A and B, prenylated isoindolinone alkaloids from the model fungus *Aspergillus nidulans*. *J Antibiot (Tokyo)* 63(7), 375-377.

Tchize Ndejoung Ble S, Sattler I, Maier A, Kelter G, Menzel KD, Fiebig HH, Hertweck C (2010) Hygrobafilomycin, a cytotoxic and antifungal macrolide bearing a unique monoalkylmaleic anhydride moiety, from *Streptomyces varsoviensis*. *J Antibiot (Tokyo)* 63(7), 359-363.

Werneburg M, Busch B, He J, Richter ME, Xiang L, Moore BS, Roth M, Dahse HM, Hertweck C (2010) Exploiting enzymatic promiscuity to engineer a focused library of highly selective antifungal and antiproliferative aureothin analogues. *J Am Chem Soc* 132(30), 10407-10413.

Ziemert N, Ishida K, Weiz A, Hertweck C, Dittmann E (2010) Exploiting the natural diversity of microviridin gene clusters for discovery of novel tricyclic depsipeptides. *Appl Environ Microbiol* 76(11), 3568-3574.

Hertweck C (2009) Hidden biosynthetic treasures brought to light. *Nat Chem Biol* 5(7), 450-452.

Ishida K, Welker M, Christiansen G, Cadel-Six S, Bouchier C, Dittmann E, Hertweck C, Tandeau de Marsac N (2009) Plasticity and evolution of aeruginosin biosynthesis in cyanobacteria. *Appl Environ Microbiol* 75(7), 2017-2026.

Kusebauch B, Busch B, Scherlach K, Roth M, Hertweck C (2009) Polyketide-chain branching by an enzymatic Michael addition. *Angew Chem Int Ed Engl* 48(27), 5001-5004.

Lackner G, Möbius N, Scherlach K, Partida-Martinez LP, Winkler R, Schmitt I, Hertweck C (2009)

Global distribution and evolution of a toxinogenic Burkholderia-Rhizopus symbiosis. *Appl Environ Microbiol* 75(9), 2982-2986.

Lackner G, Partida-Martinez LP, Hertweck C (2009) Endofungal bacteria as producers of mycotoxins. *Trends Microbiol* 17(12), 570-576.

Möbius N, Hertweck C (2009) Fungal phytotoxins as mediators of virulence. *Curr Opin Plant Biol* 12(4), 390-398.

Ndejoung Ble S, Sattler I, Dahse HM, Kothe E, Hertweck C (2009) Isoflavones with unusually modified B-rings and their evaluation as antiproliferative agents. *Bioorg Med Chem Lett* 19(22), 6473-6476.

Osada H, Hertweck C (2009) Exploring the chemical space of microbial natural products. *Curr Opin Chem Biol* 13(2), 133-134.

Salnikov ES, Friedrich H, Li X, Bertani P, Reissmann S, Hertweck C, O'Neil JD, Raap J, Bechinger B (2009) Structure and alignment of the membrane-associated peptaibols ampullosporin A and alamethicin by oriented <sup>15</sup>N and <sup>31</sup>P solid-state NMR spectroscopy. *Biophys J* 96(1), 86-8100.

Scherlach K, Hertweck C (2009) Triggering cryptic natural product biosynthesis in microorganisms. *Org Biomol Chem* 7(9), 1753-1760.

Schroeckh V, Scherlach K, Nützmann HW, Shelest E, Schmidt-Heck W, Schuemann J, Martin K, Hertweck C, Brakhage AA (2009) Intimate bacterial-fungal interaction triggers biosynthesis of archetypal polyketides in *Aspergillus nidulans*. *Proc Natl Acad Sci U S A* 106(34), 14558-14563.

Xu Z, Metsä-Ketelä M, Hertweck C (2009) Ketosynthase III as a gateway to engineering the biosynthesis of antitumoral benastatin derivatives. *J Biotechnol* 140(1-2), 107-113.

Brakhage AA, Schuemann J, Bergmann S, Scherlach K, Schroeckh V, Hertweck C (2008) Activation of fungal silent gene clusters: a new avenue to drug discovery. *Prog Drug Res* 66, 1, 3-1,12.

Fritzsche K, Ishida K, Hertweck C (2008) Orchestration of discoid polyketide cyclization in the resistomycin pathway. *J Am Chem Soc* 130(26), 8307-8316.

Nguyen T, Ishida K, Jenke-Kodama H, Dittmann E, Gurgui C, Hochmuth T, Taudien S, Platzer M, Hertweck C, Piel J (2008) Exploiting the mosaic structure of trans-acyltransferase polyketide synthases for natural product discovery and pathway dissection. *Nat Biotechnol* 26(2), 225-233.

Partida-Martinez LP, Bandemer S, Rüchel R, Dannaoui E, Hertweck C (2008) Lack of evidence of endosymbiotic toxin-producing bacteria in clinical *Rhizopus* isolates. *Mycoses* 51(3), 266-269.

Schmitt I, Partida-Martinez LP, Winkler R, Voigt K, Einax E, Dölz F, Telle S, Wöstemeyer J, Hertweck C (2008) Evolution of host resistance in a toxin-producing bacterial-fungal alliance. *ISME J* 2(6), 632-641.

Werneburg M, Hertweck C (2008) Chemoenzymatic total synthesis of the antiproliferative polyketide (+)-(R)-aureothin. *Chembiochem* 9(13), 2064-2066.

- Ziemert N, Ishida K, Liaimer A, Hertweck C, Dittmann E (2008) Ribosomal synthesis of tricyclic depsipeptides in bloom-forming cyanobacteria. *Angew Chem Int Ed Engl* 47(40), 7756-7759.
- Ziemert N, Ishida K, Quillardet P, Bouchier C, Hertweck C, de Marsac NT, Dittmann E (2008) Microcyclamide biosynthesis in two strains of *Microcystis aeruginosa*: from structure to genes and vice versa. *Appl Environ Microbiol* 74(6), 1791-1797.
- Bergmann S, Schümamm J, Scherlach K, Lange C, Brakhage AA, Hertweck C (2007) Genomics-driven discovery of PKS-NRPS hybrid metabolites from *Aspergillus nidulans*. *Nat Chem Biol* 3(4), 213-217.
- Brendel N, Partida-Martinez LP, Scherlach K, Hertweck C (2007) A cryptic PKS-NRPS gene locus in the plant commensal *Pseudomonas fluorescens* Pf-5 codes for the biosynthesis of an antimetabolic rhizoxin complex. *Org Biomol Chem* 5(14), 2211-2213.
- Gebhardt P, Dornberger K, Gollmick FA, Gräfe U, Härtl A, Görls H, Schlegel B, Hertweck C (2007) Quercinol, an anti-inflammatory chromene from the wood-rotting fungus *Daedalea quercina* (Oak Mazegill). *Bioorg Med Chem Lett* 17(9), 2558-2560.
- Hertweck C, Luzhetskyy A, Rebets Y, Bechthold A (2007) Type II polyketide synthases: gaining a deeper insight into enzymatic teamwork. *Nat Prod Rep* 24(1), 162-190.
- Ishida K, Christiansen G, Yoshida WY, Kurmayer R, Welker M, Valls N, Bonjoch J, Hertweck C, Börner T, Hemscheidt T, Dittmann E (2007) Biosynthesis and structure of aeruginoside 126A and 126B, cyanobacterial peptide glycosides bearing a 2-carboxy-6-hydroxyoctahydroindole moiety. *Chem Biol* 14(5), 565-576.
- Ishida K, Fritzsche K, Hertweck C (2007) Geminal tandem C-methylation in the discoid resistomycin pathway. *J Am Chem Soc* 129(42), 12648-12649.
- Lackner G, Schenk A, Xu Z, Reinhardt K, Yunt ZS, Piel J, Hertweck C (2007) Biosynthesis of pentangular polyphenols: deductions from the benastatin and griseorhodin pathways. *J Am Chem Soc* 129(30), 9306-9312.
- Palmu K, Ishida K, Mäntsälä P, Hertweck C, Metsä-Ketelä M (2007) Artificial reconstruction of two cryptic angucycline antibiotic biosynthetic pathways. *Chembiochem* 8(13), 1577-1584.
- Partida-Martinez LP, de Looss CF, Ishida K, Ishida M, Roth M, Buder K, Hertweck C (2007) Rhizonin, the first mycotoxin isolated from the zygomycota, is not a fungal metabolite but is produced by bacterial endosymbionts. *Appl Environ Microbiol* 73(3), 793-797.
- Partida-Martinez LP, Groth I, Schmitt I, Richter W, Roth M, Hertweck C (2007) *Burkholderia rhizoxinica* sp. nov. and *Burkholderia endofungorum* sp. nov., bacterial endosymbionts of the plant-pathogenic fungus *Rhizopus microsporus*. *Int J Syst Evol Microbiol* 57(Pt 11), 2583-2590.
- Partida-Martinez LP, Hertweck C (2007) A gene cluster encoding rhizoxin biosynthesis in *Chembiochem* 8(1), 41-45.
- Partida-Martinez LP, Monajembashi S, Greulich KO, Hertweck C (2007) Endosymbiont-dependent host reproduction maintains bacterial-fungal mutualism. *Curr Biol* 17(9), 773-777.



- Schenk A, Xu Z, Pfeiffer C, Steinbeck C, Hertweck C (2007) Geminal bismethylation prevents polyketide oxidation and dimerization in the benastatin pathway. *Angew Chem Int Ed Engl* 46(37), 7035-7038.
- Schümann J, Hertweck C (2007) Molecular basis of cytochalasan biosynthesis in fungi: gene cluster analysis and evidence for the involvement of a PKS-NRPS hybrid synthase by RNA silencing. *J Am Chem Soc* 129(31), 9564-9565.
- Traitcheva N, Jenke-Kodama H, He J, Dittmann E, Hertweck C (2007) Non-colinear polyketide biosynthesis in the aureothin and neo-aureothin pathways: an evolutionary perspective. *Chembiochem* 8(15), 1841-1849.
- Wangun HV, Dahse HM, Hertweck C (2007) Epicoccamides B-D, glycosylated tetramic acid derivatives from an *Epicoecum* sp. associated with the tree fungus *Pholiota squarrosa*. *J Nat Prod* 70(11), 1800-1803.
- Winkler R, Hertweck C (2007) Biosynthesis of nitro compounds. *Chembiochem* 8(9), 973-977.
- Winkler R, Zoicher G, Richter I, Friedrich T, Schulz GE, Hertweck C (2007) A binuclear manganese cluster that catalyzes radical-mediated N-oxygenation. *Angew Chem Int Ed Engl* 46(45), 8605-8608.
- Xu Z, Schenk A, Hertweck C (2007) Molecular analysis of the benastatin biosynthetic pathway and genetic engineering of altered fatty acid-polyketide hybrids. *J Am Chem Soc* 129(18), 6022-6030.
- Zoicher G, Winkler R, Hertweck C, Schulz GE (2007) Structure and action of the N-oxygenase AurF from *Streptomyces thioluteus*. *J Mol Biol* 373(1), 65-74.
- Ishida K, Maksimenka K, Fritzsche K, Scherlach K, Bringmann G, Hertweck C (2006) The boat-shaped polyketide resistoflavin results from re-facial central hydroxylation of the discoid metabolite resistomycin. *J Am Chem Soc* 128(45), 14619-14624.
- Kniemeyer O, Lessing F, Scheibner O, Hertweck C, Brakhage AA (2006) Optimisation of a 2-D gel electrophoresis protocol for the human-pathogenic fungus *Aspergillus fumigatus*. *Curr Genet* 49(3), 178-189.
- Müller M, He J, Hertweck C (2006) Dissection of the late steps in aureothin biosynthesis. *Chembiochem* 7(1), 37-39.
- Müller M, Kusebauch B, Liang G, Beaudry CM, Trauner D, Hertweck C (2006) Photochemical origin of the immunosuppressive SNF4435C/D and formation of orinocin through *Angew Chem Int Ed Engl* 45(46), 7835-7838.
- Scherlach K, Hertweck C (2006) Discovery of aspoquinolones A-D, prenylated quinoline-2-one alkaloids from *Aspergillus nidulans*, motivated by genome mining. *Org Biomol Chem* 4(18), 3517-3520.
- Scherlach K, Partida-Martinez LP, Dahse HM, Hertweck C (2006) Antimitotic rhizoxin derivatives from a cultured bacterial endosymbiont of the rice pathogenic fungus *Rhizopus microsporus*. *J Am Chem Soc* 128(35), 11529-11536.
- Schümann J, Hertweck C (2006) Advances in cloning, functional analysis and heterologous

expression of fungal polyketide synthase genes. *J Biotechnol* 124(4), 690-703.

Wangun HV, Härtl A, Tam Kiet T, Hertweck C (2006) Inotilone and related phenylpropanoid polyketides from *Inonotus* sp. and their identification as potent COX and XO inhibitors. *Org Biomol Chem* 4(13), 2545-2548.

Winkler R, Richter ME, Knüpfer U, Merten D, Hertweck C (2006) Regio- and chemoselective enzymatic N-oxygenation in vivo, in vitro, and in flow. *Angew Chem Int Ed Engl* 45(47), 8016-8018.

Gebhardt P, Gräfe U, Möllmann U, Hertweck C (2005) Semisynthetic preparation of leucomycin derivatives: introduction of aromatic side chains by reductive amination. *Mol Divers* 9(1-3), 27-32.

He J, Hertweck C (2005) Functional analysis of the aureothin iterative type I polyketide synthase. *Chembiochem* 6(5), 908-912.

Herold K, Gollmick FA, Groth I, Roth M, Menzel KD, Möllmann U, Gräfe U, Hertweck C (2005) Cervimycin A-D: a polyketide glycoside complex from a cave bacterium can defeat vancomycin resistance. *Chemistry* 11(19), 5523-5530.

Partida-Martinez LP, Hertweck C (2005) Pathogenic fungus harbours endosymbiotic bacteria for toxin production. *Nature* 437(7060), 884-888.

Winkler R, Hertweck C (2005) Sequential enzymatic oxidation of aminoarenes to nitroarenes via hydroxylamines. *Angew Chem Int Ed Engl* 44(26), 4083-4087.

Xu Z, Jakobi K, Welzel K, Hertweck C (2005) Biosynthesis of the antitumor agent chartreusin involves the oxidative rearrangement of an anthracyclic polyketide. *Chem Biol* 12(5), 579-588.

Ziehl M, He J, Dahse HM, Hertweck C (2005) Mutasynthesis of aureonitrile: an aureothin derivative with significantly improved cytostatic effect. *Angew Chem Int Ed Engl* 44(8), 1202-1205.

Zöllner T, Gebhardt P, Beckert R, Hertweck C (2005) Efficient synthesis of 9- and 13-oxo leucomycin derivatives using hypervalent iodine reagents in solution and on solid support. *J Nat Prod* 68(1), 112-114.

He J, Müller M, Hertweck C (2004) Formation of the aureothin tetrahydrofuran ring by a bifunctional cytochrome p450 monooxygenase. *J Am Chem Soc* 126(51), 16742-16743.

Herold K, Xu Z, Gollmick FA, Gräfe U, Hertweck C (2004) Biosynthesis of cervimycin C, an aromatic polyketide antibiotic bearing an unusual dimethylmalonyl moiety. *Org Biomol Chem* 2(17), 2411-2414.

Hertweck C, Xiang L, Kalaitzis JA, Cheng Q, Palzer M, Moore BS (2004) Context-dependent behavior of the enterocin iterative polyketide synthase; a new model for ketoreduction. *Chem Biol* 11(4), 461-468.

Wangun HV, Berg A, Hertel W, Nkengfack AE, Hertweck C (2004) Anti-inflammatory and anti-hyaluronate lyase activities of lanostanoids from *Piptoporus betulinus*. *J Antibiot (Tokyo)* 57(11), 755-758.

Busch B, Hertweck C (0) Evolution of metabolic diversity in polyketide-derived pyrones: using the non-colinear aureothin assembly line as a model system. *Phytochemistry* 70(15-16), 1833-1840.

\*equal contribution #corresponding author