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SCIENTIFIC CAREER and AWARDS:

Honorary doctor degree in Agriculture at the SLU, Uppsala (2011)

Professor (adjunct) at the TU-Braunschweig (2006)

Venia legendi for **microbiology** (1999)

1985 Dr. rer. nat. in Biochemistry

1980 - 1984 PhD in Biochemistry: Institute of Biochemistry, Medical Faculty, Martin-Luther-University, Halle-Wittenberg

1980: Diplom Chemiker

1975-1980 Study of chemistry at Martin-Luther-University, Halle-Wittenberg

EXPERTISE and RESEARCH INTEREST:

- Development and application of new molecular techniques to detect plant pathogens and to study their ecology (plant microbe interaction)
- Community-level analysis of structural and functional diversity of microbes in soil and in the rhizosphere (characterisation of succession of antagonists, pathogens and microbial populations in response to environmental triggers)
- Evaluation of effects of agricultural management systems on microbial communities and plant pathogen abundance
- Ecology and diversity of bacterial antibiotic resistance genes and plasmids, horizontal gene spread.

SCIENTIFIC SERVICES:

Editor of FEMS Microbiology Ecology

Editor of Frontiers in Microbiology

Editorial board of Applied and Environmental Microbiology

Editorial board The ISME Journal (Nature)

Evaluation panels:

- National Science Foundation (USA), DFG (Germany), NERC UK, FCT Portugal, and others

SCIENTIFIC OUTPUT

Publications: Number of publications in international refereed scientific journals with citation data in WoS: 187; Number of citations according to WoS: 10407; **H-index: 52** (30.8.2016)

Supervision of PhD theses: Number of PhD students supervised till defense of thesis: 20

SELECTED PUBLICATIONS IN PEER-REVIEWED INTERNATIONAL JOURNALS - plant microbiome, biocontrol, plant pathogens PUBLICATIONS (2017-2000)

- Adesina, M., R. Grosch, A. Lembke, T. Vatchev, K. Smalla.** 2009. In vitro antagonists of *Rhizoctonia solani* tested on lettuce: rhizosphere competence, biocontrol efficiency and rhizosphere microbial community response. *FEMS Microbiol. Ecol.* **69**:62-74.
- Berg, G., K. Smalla.** 2009. Plant species and soil type cooperatively shape the structure and function of microbial communities in the rhizosphere. *FEMS Microbiol. Ecol.* **68**:1-13.
- Adesina, M.F., A. Lembke, R. Costa, A. Speksnijder, K. Smalla.** 2007. Screening of bacterial isolates from various European soils for antagonistic activity towards *Rhizoctonia solani* and *Fusarium oxysporum*: site dependent composition and diversity revealed. *Soil Biol. Biochem.* **39**:2818-2828.
- arques, J.M., T. F. da Silva, R.E. Vollu, A.F. Blank, G.-C. Ding, L. Seldin, K. Smalla.** 2014. Plant age and genotype affect the bacterial community composition in the tuber rhizosphere of field-grown sweet potato plants. *FEMS Microbiol. Ecol.* **28**:197-215; doi: 10.1111/1574-6941.12313
- Berg, G., A. Erlacher, K. Smalla, R. Krause.** 2014. Vegetable microbiomes: is there a connection between opportunistic infections, human health and our "gut feeling"? *Microb. Biotechnol.* doi: 10.1111/1751-7915.12159. [Epub ahead of print]
- Berg, G., A. Fritze, N. Roskot, K. Smalla.** 2001. Evaluation of potential biocontrol rhizobacteria from different host plants of *Verticillium dahliae* Kleb. *J. Appl. Microbiol.* **156**:75-82.
- Berg, G., C. Zachow, J. Lottmann, M. Götz, R. Costa, K. Smalla.** 2005. Impact of soil type and plant species on rhizosphere associated fungi antagonistic to *Verticillium dahliae* Kleb. *Appl. Environ. Microbiol.* **71**:4203-4213.
- Berg, G., K. Opelt, C. Zachow, J. Lottmann, M. Götz, R. Costa, K. Smalla.** 2006. The rhizosphere effect on bacteria antagonistic towards the pathogenic fungus *Verticillium dahliae*. *FEMS Microbiol. Ecol.* **56**:250-261.
- Berg, G., M. Grube, M. Schloter, K. Smalla.** 2014. Unraveling the plant microbiome: looking back and future perspectives. *Front. Microbiol.* **5**:148.
- Berg, G., N. Roskot, A. Steidle, L. Eberl, A. Zock, K. Smalla.** 2002. Plant-dependent genotypic and phenotypic diversity of antagonistic rhizobacteria isolated from different *Verticillium* host plants. *Appl. Environ. Microbiol.* **68**:3328-3338.
- Berg, G., S. Kurze, A. Buchner, E.M. Wellington, K. Smalla.** 2000. Successful strategy for the selection of new strawberry associated rhizobacteria antagonistic to *Verticillium* wilt. *Can. J. Microbiol.* **46**:1128-1137.
- Costa, R., J.F. Salles, G. Berg, K. Smalla.** 2006. Cultivation-independent analysis of *Pseudomonas* species in soil and in the rhizosphere of field-grown *Verticillium dahliae* host plants. *Environ. Microbiol.* **8**:2136-2149.
- Costa, R., M. Götz, N. Mrozek, J. Lottmann, G. Berg, K. Smalla.** 2006. Effect of site and plant species on rhizosphere community structure as revealed by molecular analysis of different microbial guilds. *FEMS Microbiol. Ecol.* **56**:236-249.
- Costa, R., N.C.M. Gomes, A. Milling, K. Smalla.** 2004. An optimized protocol for simultaneous extraction of DNA and RNA from soils. *Braz. J. Microbiol.* **35**: 230-234.
- Costa, R., N.C.M. Gomes, E. Krögerrecklenfort, K. Opelt, G. Berg, K. Smalla.** 2007. *Pseudomonas* community structure and antagonistic potential in the rhizosphere: insights gained by combining phylogenetic and functional gene-based analyses. *Environ. Microbiol.* **9**:2260-2273.
- Costa, R., N.C.M. Gomes, R. Peixoto, N. Rumjanek, G. Berg, L. Mendonça-Hagler, K. Smalla.** 2006. Diversity and antagonistic potential of *Pseudomonas* spp. in the rhizosphere of maize grown in a subtropical organic farm. *Soil biology and biochemistry* **38**:2434-2447.
- Dematheis, F., B. Kurtz, S. Vidal, K. Smalla.** 2012. Microbial communities associated with the larval gut and eggs of western corn rootworm. *PLoS ONE* **7**: e44685.
- Dematheis, F., B. Kurtz, S. Vidal, K. Smalla.** 2013. Multitrophic interactions among Western Corn Rootworm *Glomus intraradices* and microbial communities in the rhizosphere and endorhiza of maize. *Frontiers in Microbiology* **4**
- Dematheis, F., U. Zimmerling, C. Flocco, B. Kurtz, S. Vidal, S. Kropf, K. Smalla.** 2012. Multitrophic interaction in the rhizosphere of maize: Root feeding of Western Corn Rootworm larvae alters the microbial community composition. *PLoS ONE* **7**:e37288.
- Ding, G.-C., Y. Piceno, N. Weinert, H. Heuer, A.-B. Dohrmann, A. Carrillo, G. Andersen, T. Castellanos, C.C. Tebbe, K. Smalla.** 2013. Changes of soil bacterial diversity as a consequence of agricultural land use in a semi-arid ecosystem. *PLoS One*, **8**, e59497.
- Eltlbany, N., Z.-Z. Prokscha, P. Castañeda-Ojeda, E. Krögerrecklenfort, H. Heuer, W. Wohanka, C. Ramos, K. Smalla.** 2012. A new bacterial disease on *Mandevilla sanderi* caused by *Pseudomonas savastanoi* – lessons learned for bacterial diversity studies. *Appl. Environ. Microbiol.* **78**:8470-8473.
- Fornefeld, E., A. Schikora, G. Berg, R. Grosch, A. Erlacher, T. Kühne, K. Smalla.** 2015. Humanpathogene Bakterien auf Pflanzen. *Journal für Kulturpflanzen* **67**(9):297-309.
- Genetic diversity of *Ralstonia solanacearum* strains from China assessed by PCR-based fingerprints to unravel host plant and site-dependent distribution patterns. *FEMS Microbiol. Ecol.* **75**:507-519.

- Gomes, N.C.M., H. Heuer, J. Schönfeld, R. Costa, L. Hagler-Mendonça, K. Smalla. 2001. Bacterial diversity of the rhizosphere of maize (*Zea mays*) grown in tropical soil studied by temperature gradient gel electrophoresis. *Plant and Soil* **232**:167-180.
- Gomes, N.C.M., O. Fagbola, R. Costa, N.G. Rumjanek, A. Buchner, L. Mendonça-Hagler, K. Smalla. 2003. Dynamics of fungal communities in bulk and maize rhizosphere soil in the tropics. *Appl. Environ. Microbiol.* **69**:3758-3766.
- Götz, M., H. Nirenberg, S. Krause, H. Wolters, S. Draeger, A. Buchner, J. Lottmann, G. Berg, K. Smalla. 2006. Fungal endophytes in potato roots studied by traditional isolation and cultivation-independent DNA-based methods. 2006. *FEMS Microbiol. Ecol.* **56**:2136-2149.
- Götz, M., N.C.M. Gomes, A. Dratwinski, R. Costa, G. Berg, R. Peixoto, L. Mendonça-Hagler, K. Smalla. 2006. Survival of *gfp*-tagged antagonistic bacteria in the rhizosphere of tomato plants and their effects on the indigenous bacterial community; *FEMS Microbiol. Ecol.* **56**:207-218.
- Grosch, R., J. Lottmann, V.N.C. Rehn, K.G. Rehn, L. Mendonça-Hagler, K. Smalla, G. Berg. 2007. Analysis of antagonistic interactions between *Trichoderma* isolates from Brazilian weeds and the soil-borne pathogen *Rhizoctonia solani*. *J. Plant Dis. Protect.* **4**:167-175.
- Grosch, R., S. Dealtry, S. Schreiter, G. Berg, L. Mendonça-Hagler, K. Smalla. 2012. Biocontrol of *Rhizoctonia solani*: complex interaction of biocontrol strains, pathogen and indigenous microbial community in the rhizosphere of lettuce shown by molecular methods. *Plant Soil* **361**:343-357.
- Handelsman, J., K. Smalla. 2003. Conversation with the silent majority. *Curr. Opin. Microbiol.* **6**:271-273.
- Hanschen, F.S., B. Yim, T. Winkelmann, K. Smalla, M. Schreiner. 2015. Degradation of biofumigant isothiocyanates and allyl glucosinolate in soil and their effects on the microbial community composition. *PLOS ONE*, doi: 10.1371/journal.pone.0132931
- Heuer, H. J. Ebers, N. Weinert, K. Smalla. 2010. Variation in permissiveness for broad-host-range plasmids among genetically indistinguishable isolates of *Dickeya* sp. from a small field plot. *FEMS Microbiol. Ecol.* **73**:190-196.
- Heuer, H., G. Wieland, J. Schönfeld, A. Schönwälder, N.C.M. Gomes, K. Smalla. 2001. Bacterial community profiling using DGGE or TGGE analysis. pp 177-190. *In* P. Rouchelle (ed), *Environmental Molecular Microbiology: Protocols and Applications*. Horizon Scientific Press, Wymondham, UK.
- Heuer, H., R.M. Kroppenstedt, J. Lottmann, G. Berg, K. Smalla. 2002. Effects of T4 lysozyme release from transgenic potato roots on bacterial rhizosphere communities are negligible relative to natural factors. *Appl. Environ. Microbiol.* **68**:1325-1335.
- Heuer, H., Y.-N. Yin, Q.-Y. Xue, K. Smalla, J.-H. Guo. 2007. Repeat domain diversity of *avrBs3*-like genes in *Ralstonia solanacearum* strains and association with host preferences in the field. *Appl. Environ. Microbiol.* **73**:4379-4384.
- Hjort, K., M. Bergström, M.F. Adesina, J.K. Jansson, K. Smalla, S. Sjöling. 2010. Chitinase genes revealed and compared in bacterial isolates, DNA extracts and a metagenomic library from a phytopathogen-suppressive soil. *FEMS Microbiol. Ecol.* **71**:197-207.
- Lottmann, J., H. Heuer, J. de Vries, A. Mahn, K. Düring, W. Wackernagel, K. Smalla, G. Berg. 2000. Establishment of introduced antagonistic bacteria in the rhizosphere of transgenic potatoes and their effect on the bacterial community. *FEMS Microb. Ecol.* **33**:41-49.
- Marques, J.M., T.F. da Silva, R. Estebanez Vollú, J. Rossetti Mateus de Lacerda, A.F. Blank, K. Smalla, L. Seldin. 2015. Bacterial endophytes of sweet potato tuberous roots affected by the plant genotype and growth stage. *Applied Soil Ecology* **96**:273-281
- Marten, P., K. Smalla, G. Berg. 2000. Genotypic and phenotypic differentiation of an antifungal biocontrol strain belonging to *Bacillus subtilis*. *J. Appl. Microbiol.* **89**:463-471.
- Meincke, R., N. Weinert, V. Radl, M. Schloter, K. Smalla, G. Berg. 2010. Development of a molecular approach to describe the composition of *Trichoderma* communities. *J. Microbiol. Meth.* **80**:63-69.
- Mello, A., G.-C. Ding, Y.M. Piceno, C. Napoli, L.M. Tom, T.Z. de Santis, G.L. Andersen, K. Smalla, P. Bonfante. 2013. Truffle brûlés have an impact on the diversity of soil bacterial communities. *PLoS ONE* **8** (4): e61945; doi: 10.1371/journal.pone.0061945
- Milling, A., A. Lembke, J. Schönfeld, K. Smalla. 2004. Survival and activity of the *Ralstonia solanacearum* antagonist *Pseudomonas chlororaphis* 24-4 in the rhizosphere of tomato and its impact on the indigenous bacterial community. pp 177-186. *In* R.A. Sikora, S. Gowen, R. Hauschild, and S. Kiewnick (eds.) *Multitrophic Interactions in Soil and Integrated Control*, IOBC wprs Bulletin 27.
- Milling, A., K. Smalla, F.X. Maidl, M. Schloter, J.C. Munch. 2004. Effect of transgenic potatoes with an altered starch composition on the diversity of soil and rhizosphere bacteria and fungi. *Plant and Soil* **266**:23-39.
- Neumann, G., S. Bott, M.A. Ohler, H.-P. Mock, R. Lippmann, R. Grosch, K. Smalla. 2014. Root exudation and root development of lettuce (*Lactuca sativa* L. cv, Tizian) as affected by different soils. *Frontiers in Microbiology* **5**, Article 2; doi: 10.3389/fmicb.2014.00002
- Nielsen, K.M., J.D. van Elsas, K. Smalla. 2001. Dynamics, horizontal transfer and selection of novel DNA in bacterial populations in the phytosphere of transgenic plants. *Ann. Microbiol.* **51**:79-94.
- Oros-Sichler, M., N.C.M. Gomes, G. Neuber, K. Smalla. 2006. A new semi-nested PCR protocol to amplify large 18S *rRNA* gene fragments for PCR-DGGE analysis of soil fungal communities. *J Microbiol Meth* **65**: 63-75.
- Peixoto, R., M. Götz, A. Milling, G. Berg, A. Rosado, L. Mendonça-Hagler, K. Smalla. 2004. Monitoring *gfp*-tagged bacterial antagonists in the rhizosphere of tomato plants, pp 219-224. *In* R.A. Sikora, S. Gowen, R. Hauschild and S. Kiewnick (eds.) *Multitrophic Interactions in Soil and Integrated Control*, IOBC wprs Bulletin 27.
- Rossmann, B., H. Müller, K. Smalla, S. Mpiira, J.B. Tumuhairwe, C. Staver, G. Berg. 2012. Banana-associated microbial communities in Uganda are highly diverse but dominated by *Enterobacteriaceae*. *Appl. Environ. Microbiol.* **78**:4933-4941.

- Schönfeld, J., A. Gelsomino, L.S. van Overbeek, A. Gorissen, K. Smalla, J.D. van Elsas.** 2003. Effects of compost addition and simulated solarisation on the fate of *Ralstonia solanacearum* biovar 2 and indigenous bacteria in soil. *FEMS Microbiol. Ecol.* **43**:63-74.
- Schönfeld, J., H. Heuer, J.D. van Elsas, K. Smalla** (2003) Specific and sensitive detection of *Ralstonia solanacearum* in soil on the basis of PCR amplification of *fliC* fragments. *Appl. Environ. Microbiol.* **69**:7248-7256.
- Schreiter, S., G.-C. Ding, H. Heuer, G. Neumann, M. Sandmann, R. Grosch, S. Kropf, K. Smalla.** 2014. Effect of the soil type on the microbiome in the rhizosphere of field-grown lettuce. *Frontiers in Microbiology* **5**, Article 144; doi: 10.3389/fmicb.2014.00144
- Schreiter, S., G.-C. Ding, R. Grosch, S. Kropf, K. Antweiler, K. Smalla.** 2014. Soil type dependent effects of a potential biocontrol inoculant on indigenous bacterial communities in the rhizosphere of field-grown lettuce. *FEMS Microbiol. Ecol.* doi: 10.1111/1574-6941.12430
- Schreiter, S., M. Sandmann, K. Smalla, R. Grosch.** 2014. Soil type dependent rhizosphere competence and biocontrol of two bacterial inoculant strains and their effects on the rhizosphere microbial community of field-grown lettuce. 2014. *PLoS ONE* **9**: e103726;
- Schreiter, S., N. Eltlbany, K. Smalla.** 2015. Microbial communities in the rhizosphere analyzed by cultivation-independent DNA-based methods. In: *Principles of Plant-Microbe Interactions* (Ben Lugtenberg,
- Smalla, K., G. Wieland, A. Buchner, A. Zock, J. Parzy, S. Kaiser, N. Roskot, H. Heuer, G. Berg.** 2001. Bulk and rhizosphere soil bacterial communities studied by denaturing gradient gel electrophoresis: plant-dependent enrichment and seasonal shifts revealed. *Appl. Environ. Microbiol.* **67**:4742-4750.
- Thiele, K., K. Smalla, S. Kropf, F. Rabenstein.** 2012. Detection of *Acidovorax valerianellae*, the causing agent of bacterial leaf spots in corn salad [*Valerianella locusta* (L.) Laterr.], in corn salad seeds. *Lett Appl Microbiol.* **54**(2):112-118.
- Weinert, N., R. Meincke, C. Gottwald, H. Heuer, M. Schloter, G. Berg, K. Smalla.** 2011. Bacterial diversity on the surface of potato tubers in soil and influence of the plant genotype. *FEMS Microbiol. Ecol.* **75**:497-506.
- Weinert, N., R. Meincke, C. Gottwald, H. Heuer, N.C. Gomes, M. Schloter, G. Berg, K. Smalla.** 2009. Rhizosphere communities of genetically modified zeaxanthin-accumulating potato plants and their parent cultivar differ less than those of different potato cultivars. *Appl. Environ. Microbiol.* **75**:3859-3865.
- Weinert, N., R. Meincke, C. Gottwald, V. Radl, X. Dong, M. Schloter, G. Berg, K. Smalla.** 2010. Effects of genetically modified potatoes with increased zeaxanthin content on the abundance and diversity of rhizobacteria with in vitro antagonistic activity do not exceed natural variability among cultivars. *Plant Soil* **326**:437-452.
- Weinert, N., R. Meincke, M. Schloter, G. Berg, K. Smalla.** 2010. Effects of genetically modified plants on soil microorganisms. In *Environmental Microbiology*, 2nd edition. Eds, R. Mitchell and Ji-Dong Gu, pp 235-258. Wiley-Blackwell, Hoboken, N.J.
- Weinert, N., Y. Piceno, G.-C. Ding, R. Meincke, H. Heuer, G. Berg, M. Schloter, G. Andersen, K. Smalla.** 2011. PhyloChip hybridisation uncovered an enormous bacterial diversity in the rhizosphere of different potato cultivars: many common and few cultivar-dependent taxa. *FEMS Microbiol. Ecol.* **75**:497-506.
- Xue, Q.-Y., G.-C. Ding, S.-M. Li, Y. Yang, C.-Z. Lan, J.-H. Guo, K. Smalla.** 2013. Rhizocompetence and antagonistic activity towards genetically diverse *Ralstonia solanacearum* strains – an improved strategy for selecting biocontrol agents. *Applied Microbiology and Biotechnology* **97**:1361-1371, doi 10.1007/s00253-012-4021-4 PMID:22526784
- Yim, B., Hanschen, F.S., Wrede, A., Nitt, H., Schreiner, M., Smalla, K., Winkelmann, T.** 2016. Effects of biofumigation using *Brassica juncea* and *Raphanus sativus* in comparison to disinfection using Basamid on apple plant growth and soil microbial communities at three field sites with replant disease. *Plant Soil*, doi: 10.1007/s11104-016-2876-3
- Yim, B., K. Smalla, T. Winkelmann.** 2013. Evaluation of apple replant problems based on different soil disinfection treatments – links to soil microbial community structure? *Plant Soil* **366**:617-631; doi: 10.1007/s11104-012-14546.
- Yim, B., T. Winkelmann, G.-C. Ding, K. Smalla.** 2015. Different bacterial communities in heat and gamma irradiation treated replant disease soils revealed by 16S rRNA gene analysis – contribution to improved aboveground apple plant growth? *Frontiers in Microbiology* **6**, Article 1224, 1-12; doi: 10.3389/fmicb.2015.01224