



FACULTEIT DER NATUURWETENSCHAPPEN, WISKUNDE & INFORMATICA  
*Swammerdam Institute for Life Sciences*

To whom it may concern  
C.V. Stanley Brul 2018

*Prof dr S. Brul*  
*Science Park 904*  
*1098 XH Amsterdam*  
*tel.: 020-525 7079/6970*  
*fax: 020 -525 7934*  
*e-mail s.brul@uva.nl*

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**Prof.dr. Stanley Brul**  
**Chair Molecular Biology and Microbial Food Safety**  
**SILS University of Amsterdam (UvA)**  
**E-mail: [s.brul@uva.nl](mailto:s.brul@uva.nl) URL:**  
<http://sils.uva.nl/research/collaboration-initiatives/content/molecular-biology-and-microbial-food-safety/molecular-biology--microbial-food-safety.html>



**EXPERTISE:**

Biochemistry; Molecular Biology; Molecular stress physiology of (micro)organisms; 'Omics' food spoilage and pathogenic microorganisms in particular *Bacilli* and yeast

**SCIENTIFIC CAREER:**

1990-1994 Post-doc Microbiology, University Nijmegen & short stay Rockefeller Univ, NWO supported.  
1994-1997 Food Preservation projec manager, Unilever R&D, NL &UK.  
1997-2002 Food Preservation program & Technology Platform manager, Unilever R&D, NL & UK.  
2000-2002 Professor of Industrial Microbiology, endowed chair at SILS, UvA.  
2002-2007 0,4 FTE Senior Scientist Mild Preservation, Food Microbiology, Unilever R&D, NL & UK.  
2002-2007 0,6 FTE Professor Molecular Biology and Microbial Food Safety, SILS, UvA.  
2007-present Professor Molecular Biology and Microbial Food Safety, SILS, UvA.

**ACADEMIC POSITIONS:**

0,6 FTE Research head of laboratory Molecular Biology and Microbial Food Safety & Master track coordinator Biochemistry & Metabolic Disease, Biomedical Sciences, UvA & AMC; 2002-present (10-15 students per year); 0,4 FTE Director of the bachelor Biomedical Sciences (~400 students), UvA & AMC; 2007-present.

**SCIENTIFIC SERVICES:**

**Editorial boards:** FEMS Yeast Research; Food Microbiology; Innov. Food Sci. & Emerg. Technol.; Biomed. Research International.; Guest editor special issue Current Opinion Food Science (2016); Guest editor International Journal of Food Microbiology (2017).

**Referee for:** PNAS, Curr. Opinion Microbiology, ASM & FEMS Journals, PLoS etc. and ~40PhD theses (including the Netherlands, France, UK, Norway).

**Evaluation panels:** NWO & STW, BBSRC UK, IWT Belgium. Co-evaluator of the Dutch Technology Institute (TNO) Life Science Program (2005). Evaluator of the Australian Food Safety Centre (Tasmania, Melbourne, Sydney, Brisbane) (2007). Chair of the education evaluation committee of the five biomedical sciences bachelor & master courses in Flanders (2013). Chair of the research evaluation committee of the Fungal Biodiversity Centre of the Netherlands Royal Dutch Academy of Sciences (2014). Regular Evaluator of Dutch Food Safety Authority policy documents. Member of the Expert Science panel Institutional Science review Institute Food Research Norwich (IFR, UK). Expert Science Advisor Gut Health Food Safety program Institute Strategic Research Program IFR (2015). Expert member of the evaluation Ci. Chemistry of the bachelor & master program Univ. Utrecht (2018).

**Board member of scientific & related organisations:** 2009-present chair of the Dutch Institute for Biology (NIBI). 2010-Former president (2003-2009) and present Federation European Microbiological Societies (FEMS) representative of the Royal Dutch Society for Microbiology (2009-2017). Co-organizer FEMS 2015 Congress of European microbiologists in Maastricht. Member of the Agri-Food cluster of the Amsterdam Economic Board.

#### **AWARDS/PRIZES/MAJOR GRANTS**

Unilever Research Prize lecture (1998); Distinguished Research Fellow University Tasmania (2007); Lecturer at the Unilever Research Prize Symposium 2017.  
Unilever Innovation Fund Grant Novel Food Preservation (1 M euro 2002-2007); EET grant Food Preservation (400 k euro; 2002-2006); STW grant Bacterial Spore germination (800 k euro; 2003-2007); Casimir grant Bacterial Spore inactivation (220 k euro; 2007-2009); STW grant Targeted Inhibition Bacterial Spores (300 k€; 2010-2014); Dutch Food Safety Authority grants antibiotic resistance (1,1M€; 2011-2015 & 2014-2018; 2016-2020); TNO grants microbial food safety and fungal growth optimization (300 k€; 2012-2016); Nanonext participation in Food Stability project (150 k€; 2011-2015); EFRO grant on valorization of bioactive compounds from algae; various Erasmus Mundus PhD fellowships; various CSC fellowships; MBMFS hosted Macgillavry fellow Budovskaya 2011-2016 (800 keuro; focused on Aging).

#### **OUTPUT**

##### **Publications (Google scholar):**

Total number of publications : 232. Total citations (Google scholar): 7254; Two most cited papers: 758 (2002) & 968 (1999) times; H-index 44 (31 from 2013); i10 index 106 (82 from 2013).

##### **Selected Publications**

Hoeksema, M., **Brul, S.**, ter Kuile, B.H. 2018. Influence of reactive oxygen species on *de novo* acquisition of resistance to bactericidal antibiotics. *Antimicrob. Agents. Chemother.* (in press: doi: 10.1128/AAC.02354-17).

Abhyankar, W.R., Wen, J., Swarge, B.N., Tu, Z., de Boer, R., Smelt, J.P.P.M., de Koning, L.J., Manders, E., de Koster, C.G. and **Brul, S.** 2018. Proteomics and microscopy tools for the study of antimicrobial resistance and germination mechanisms of bacterial spores. *Food Microbiology* (in press: doi.org/10.1016/j.fm.2018.03.006).

Stelder, S.K., Benito de Moya, C., Hoefsloot, H.C.J., de Koning, L.J., **Brul, S.\*** and de Koster, C.G.\* 2018. Stoichiometry, Absolute Abundance, and Localization of proteins in the *Bacillus cereus* spore coat insoluble fraction determined using a QconCAT approach. *J. Proteome Res.* 17, 903-917.

Abhyankar, W., Stelder, S., de Koning, L. de Koster, C.G. & **Brul, S.** (2017) 'Omics' for microbial food stability: Proteomics for the development of predictive models for bacterial spore stress survival and outgrowth. *International Journal Food Microbiology* 240, 11-18.

Van Beilen, J., Blohmke, C.J., Folkerts, H., de Boer, R., Zakrzewska, A., Kulik, W., Vaz, F.M., **Brul, S.**, & ter Beek, A. (2016). RodZ and PgsA Play Intertwined Roles in Membrane Homeostasis of *Bacillus subtilis* and Resistance to Weak Organic Acid Stress. *Frontiers in Microbiology* 7, 1633.

Pandey, R., Vischer, N.O., Smelt, J.P., van Beilen, J.W., ter Beek, A., de Vos, W.H., **Brul, S.** & Manders, E.M. (2016) Intracellular pH response to weak acid stress in individual vegetative *Bacillus subtilis* cells. *Applied and Environmental Microbiology* 82, 6463-6471.

Feng, Y., Hodiamont, C.J., Hest, R.M. van, **Brul, S.**, Schultsz, C. & Kuile, B.H. ter (2016). Development of Antibiotic Resistance during Simulated Treatment of *Pseudomonas aeruginosa* in Chemostats. *PLoS One*, 11 (2):e0149310. doi: 10.1371/journal.pone.0149310

Feng, Y., Jonker, M.J., Moustakas, I., **Brul, S.** & Kuile, B.H. ter (2016). Dynamics of mutations during development of resistance by *Pseudomonas aeruginosa* against five antibiotics. *Antimicrobial Agents and Chemotherapy*, 60 (7), 4229-4236. doi: 10.1128/AAC.00434-16

Händel, N., Sayette, S. de la, Verweij, P.E., **Brul, S.** & Kuile, B.H. ter (2015). De novo induction of resistance against voriconazole in *Aspergillus fumigatus*. *Journal of Global Antimicrobial Resistance*, 3 (1), 52-53. doi: 10.1016/j.jgar.2015.01.001

- Händel, N., Hoeksema, M., Freijo Mata, M., **Brul, S.** & Kuile, B.H. ter (2015). Effects of Stress, Reactive Oxygen Species, and the SOS Response on De Novo Acquisition of Antibiotic Resistance in *Escherichia coli*. *Antimicrobial Agents and Chemotherapy*, *60* (3), 1319-1327. doi: 10.1128/AAC.02684-15
- Zheng, L., Abhyankar, W., Ouwering, N., Dekker, H.L., Veen, H. van, Wel, N.N. van der, Roseboom, W., Koning, L.J. de, **Brul, S.** & Koster, C.G. de (2016). *Bacillus subtilis* Spore Inner Membrane Proteome. *Journal of Proteome Research*, *15* (2), 585-594. doi: 10.1021/acs.jproteome.5b00976
- Boer, R. de, Smith, R.L., De Vos, W.H., Manders, E.M.M., **Brul, S.** & Spek, H. van der (2015). *Caenorhabditis elegans* as a Model System for Studying Drug Induced Mitochondrial Toxicity. *PLoS One*, *10* (5):e0126220. doi: 10.1371/journal.pone.0126220
- Händel, N., Otte, S., Jonker, M.J., **Brul, S.** & Kuile, B.H. ter (2015). Factors that affect transfer of the IncI1  $\beta$ -lactam resistance plasmid pESBL-283 between *E. coli* strains. *PLoS One*, *10* (4), e0123039. doi: 10.1371/journal.pone.0123039
- Klis, F.M. & **Brul, S.** (2015). Adaptations of the secretome of *Candida albicans* in response to host-related environmental conditions. *Eukaryotic Cell*, *14* (12), 1165-1172. doi: 10.1128/EC.00142-15
- Lezzerini, M., Ven, K. van de, Veerman, M., **Brul, S.** & Budovskaya, Y.V. (2015). Specific RNA Interference in *Caenorhabditis elegans* by Ingested dsRNA Expressed in *Bacillus subtilis*. *PLoS One*, *10* (4), e0124508. doi: 10.1371/journal.pone.0124508
- Pandey, R., Pieper, G.H., Beek, A. ter, Vischer, N.O.E., Smelt, J.P.P.M., Manders, E.M.M. & **Brul, S.** (2015). Quantifying the effect of sorbic acid, heat and combination of both on germination and outgrowth of *Bacillus subtilis* spores at single cell resolution. *Food Microbiology*, *52*, 88-96. doi: 10.1016/j.fm.2015.06.007
- Stelder, S.K., Mahmud, S.A., Dekker, H.L., Koning, L.J. de, **Brul, S.** & Koster, C.G. de (2015). Temperature Dependence of the Proteome Profile of the Psychrotolerant Pathogenic Food Spoiler *Bacillus weihenstephanensis* Type Strain WSBC 10204. *Journal of Proteome Research*, *14* (5), 2169-2176. doi: 10.1021/pr501307t
- Abhyankar, W., Pandey, R., Beek, A. ter, **Brul, S.**, Koning, L.J. de & Koster, C.G. de (2015). Reinforcement of *Bacillus subtilis* spores by cross-linking of outer coat proteins during maturation. *Food Microbiology*, *45* (A), 54-62. doi: 10.1016/j.fm.2014.03.007
- Abhyankar, W., Koning, L.J. de, **Brul, S.** & Koster, C.G. de (2014). Spore Proteomics: The Past, Present and the Future. *FEMS Microbiology Letters*, *358* (2), 137-144. doi: 10.1111/1574-6968.12568
- Beek, A. ter, Wijman, J.G.E., Zakrzewska, A., Orij, R., Smits, G.J. & **Brul, S.** (2015). Comparative physiological and transcriptional analysis of weak organic acid stress in *Bacillus subtilis*. *Food Microbiology*, *45* (A), 71-82. doi: 10.1016/j.fm.2014.02.013
- Beilen, J.W.A. van, Teixeira De Mattos, M.J., Hellingwerf, K.J. & **Brul, S.** (2014). Distinct Effects of Sorbic Acid and Acetic Acid on the Electrophysiology and Metabolism of *Bacillus subtilis*. *Applied and Environmental Microbiology*, *80* (19), 5918-5926. doi: 10.1128/AEM.01391-14
- Feng, Y., Händel, N., Groot, M.H.P. de, **Brul, S.**, Schultsz, C. & Kuile, B.H. ter (2014). Experimental Simulation of the Effects of an Initial Antibiotic Treatment on a Subsequent Treatment after Initial Therapy Failure. *Antibiotics*, *3* (1), 49-63. doi: 10.3390/antibiotics3010049
- Mensonides, F.I.C., **Brul, S.**, Hellingwerf, K.J., Bakker, B.M. & Teixeira De Mattos, M.J. (2014). A kinetic model of catabolic adaptation and protein reprofiling in *Saccharomyces cerevisiae* during temperature shifts. *The FEBS Journal*, *281* (3), 825-841. doi: 10.1111/febs.12649
- Pandey, R., Beek, A. ter, Vischer, N.O.E., Smelt, J.P.P.M., Kemperman, R., Manders, E.M.M. & **Brul, S.** (2015). Quantitative analysis of the effect of specific tea compounds on germination and outgrowth of *Bacillus subtilis* spores at single cell resolution. *Food Microbiology*, *45* (A), 63-70. doi: 10.1016/j.fm.2014.03.006

Schuurmans, J.M., Hijum, S.A.F.T. van, Piet, J.R., Händel, N., Smelt, J., **Brul, S.** & Kuile, B.H. ter (2014). Effect of growth rate and selection pressure on rates of transfer of an antibiotic resistance plasmid between *E. coli* strains. *Plasmid*, 72, 1-8. doi: 10.1016/j.plasmid.2014.01.002

Smelt, J.P., Hoefsloot, H.C., Koster, C.G. de, Schuurmans, J.M., Kuile, B.H. ter & **Brul, S.** (2015). Simulation of the rate of transfer of antibiotic resistance between *Escherichia coli* strains cultured under well controlled environmental conditions. *Food Microbiology*, 45 (B), 189-194. doi: 10.1016/j.fm.2014.03.019

Smelt, J.P.P.M. & **Brul, S.** (2014). Thermal inactivation of microorganisms. *Critical Reviews in Microbiology*, 54 (10), 1371-1385. doi: 10.1080/10408398.2011.637645

#### **Supervision & external examiner of PhD theses:**

Number of PhD students supervised to date: 18 (2000-2018); ~50 PhD theses examined (Netherlands, Belgium, Norway, UK, France, Germany)

#### **IP Valorisation:**

Keijser, B.J.F. 2007. Control of Preservation by Biomarkers. EP 05077246.6 (patent)

R. Albers, A.M. Ledebouer, S. Brul. 2007. Edible product containing beneficial moulds and/or yeast. WO/2007/031129 (patent)

R. Albers, **S. Brul**, A.M. Ledebouer, W.M. Meijer. 2007. Edible product containing beneficial bacteria. WO/2007/009568 (patent)

Ter Beek, A., **Brul, S.** Van der Vaart, M. 2008. Screening method for a preservative. EP 1935984.

#### Selected Congresses and seminars (last 5 years):

-IAFP European symposium on Microbial Risk Assessment. 'Omics tools', May 2012, Warschau, Poland; invited speaker.

-MICROAL 11<sup>th</sup> Latin American congress of Food Microbiology & Hygiene, November 2012, Buenos Aires, Argentina; invited speaker.

-Functional genomics for optimal food preservation; *Bacillus subtilis* spore germination and outgrowth or 'the awakening of sleeping beauty'. March 2013, Norwich Institute for Food Research.

-'Sporzoeken in voedsel'; van ongenode gast tot goede vriend. March 2013, FNWI Colleegetour, Amsterdam.

-Functional genomics for food preservation; Inhibiting bacterial spore germination. April 2013, Bacell, Newcastle.

-Omics steered risk assessment of food spoilage; *Bacillus subtilis* spore germination and outgrowth as a case study. Microbial spoilers in food, July 2013, Quimper, France.

-Modelling the rate of transfer of antibiotic resistance between *E coli* strains cultured under well controlled environmental conditions. 8<sup>th</sup> International Congress Predictive Food Microbiology, Sept. 2013, Paris.

-European Spore Conference, April 2014, Royal Holloway University, London.

-IAFP European Symposium, April 2015, Cardiff, UK.

-6<sup>th</sup> European Congress for Microbiologists, June 2015, Maastricht, The Netherlands.

-9<sup>th</sup> ICPFM, September 2015, Rio de Janeiro, Brazil.

-IAFP European Symposium, September 2016, Athens, Greece.

-Spoilers, June 2017, Quimper, France. Antimicrobial resistance and germination mechanisms of bacterial spores.

-7<sup>th</sup> European Congress for Microbiologists, July 2017, Valencia, Spain. Shining light on bacterial spore germination and outgrowth.

-9<sup>th</sup> European Spore Conference, April 2018, London, UK. 'Omics', germinosome visualization and antimicrobial resistance of bacterial spores.

A handwritten signature in black ink, consisting of a large, stylized 'S' followed by a 'B' and a horizontal line extending to the right.

Prof. Dr. Stanley Brul

University of Amsterdam