

Publication List

2014

Park, S., **Schumann, W.**

The major bottlenecks during secretion of heterologous proteins in *Bacillus subtilis*

(2014) manuscript in preparation

Nakamoto, H., **Schumann, W.**

Bacterial heat shock regulons

(2014) manuscript in preparation

Richter, A., Kim, J.H., **Schumann, W.**

Studies on disulfide bond formation of alkaline phosphatase anchored on the outside of endospores of *Bacillus subtilis*

(2014) manuscript in preparation

Mulder, Kelly C. L., **Schumann, W.**

Construction of a novel transposable element containing an inducible promoter

Current Microbiol. (2014) **68**: 568-774.

Nguyen, Q. A., **Schumann, W.**

Use of IPTG-inducible promoters for anchoring recombinant proteins on the surface of *Bacillus subtilis* spores

Protein Expr. Purif. (2014) **95**: 67-76.

2013

Phan, T. T. P., Nguyen, H. D., **Schumann, W.**

Construction of a 5'-controlable stabilizing element (CoSE) for over-production of heterologous proteins at high levels in *Bacillus subtilis*

J. Biotechnol. (2013) **168**: 32-39.

Mulder, Kelly C. L., Bandola, J., **Schumann, W.**

Construction of an artificial *secYEG* operon allowing high level secretion of exoenzymes

Protein Expr. Purif. **89** (2013) 92-96.

2012

Schumann, W.

Das bakterielle Mobilom

Biologie in unserer Zeit **42** (2012) 174-1180

Nguyen, Bach Hue, **Schumann, W.**

The sporulation control gene *spo0M* of *Bacillus subtilis* is a target of the FtsH metalloprotease

Res. Microbiol. **163** (2012) 114-118.

Ferreira, Luis, **Schumann, W.**

Expression of recombinant proteins using *Bacillus subtilis* spores

Horizon Scientific Press (2012) p. 263-272).

Schumann, W.

Thermosensor systems in eubacteria

Adv. Exp. Med. Biol. **739** (2012) 1-16.

Phan, T.T.P., Nguyen, H.D., Schumann, W.

Development of a strong intracellular expression system for *Bacillus subtilis* by optimizing promoter elements

J. Biotechnol. (2012) **157**: 167-172.

2011

Nguyen,H.D., Phan,T.T.P., **Schumann, W.**

Analysis and application of *Bacillus subtilis* sortases to anchor recombinant proteins on the cell wall

AMB Express (2011) **1**:22

Schumann, W.

Wir sind besiedelt: Biotop Mensch

Biologie in unserer Zeit **41** (2011) 182-189.

2010

Phan, T.T.P., Nguyen, H.D., **Schumann, W.**
Establishment of a simple and rapid method to screen for strong promoters in *Bacillus subtilis*
Protein Expr. Purif. **71** (2010) 174-178.

2009

Phan, T.T.P., **Schumann, W.**
Transcriptional analysis of the lysine-responsive and riboswitch-regulated *lysC* gene of *Bacillus subtilis*
Current Microbiol. **59** (2009) 463-468.

Kim, J., **Schumann, W.**
Display of proteins on *Bacillus subtilis* endospores
Cell. Mol. Life Sci. **66** (2009) 3127-3136.

Le, A.T.T., **Schumann, W.**
The Spo0E phosphatase of *Bacillus subtilis* is a substrate of the FtsH metalloprotease
Microbiology **155** (2009) 1122-1132.

Schumann, W.
Temperature sensors of Eubacteria
Advances Appl. Microbiol. **67** (2009) 213-256.

2008

Le, A.T.T., **Schumann, W.**
Regulation of the *spoVM* gene of *Bacillus subtilis*
Current Microbiol. **57** (2008) 484-489.

Schumann, W.
Escherichia coli cloning and expression vectors.
in "Plasmids: Current Research and Future Trends" edited by G. Lipps
Horizon Scientific Press (2008), p. 1-25.

2007

Schumann, W.

Production of recombinant proteins in *Bacillus subtilis*
Advances Appl. Microbiol. **62** (2007) 137-189.

Nguyen, H.D., Phan, T.T., **Schumann, W.**

Expression vectors for the rapid purification of recombinant proteins in
Bacillus subtilis
Current Microbiol. **55** (2007) 89-93.

Paccez, J.D., Nguyen, H.D., Luiz, W.B., Ferreira, R.C.C., Sbrogio-Almeida,
M.E., **Schumann, W.**, Ferreira, L.C.S.

Evaluation of different promoter sequences and antigen sorting signals on
the immunogenicity of *Bacillus subtilis* vaccine vehicles
Vaccine **25** (2007) 4671-4680.

Schumann, W.

Bacterial stress response, pp. 36-56.
In S.K. Calderwood Ed.) Cell Stress Proteins, Springer (2007)

Schumann, W.

Thermosensors in eubacteria: role and evolution
J. Biosci. **32** (2007) 547-557.

Phan, T.T.P., **Schumann, W.**

Development of a glycine-inducible expression system for *Bacillus subtilis*
J. Biotechnol. **128** (2007) 486-499.

Le, A.T.T., **Schumann, W.**

A novel cold-inducible expression system for *Bacillus subtilis*
Protein Expr. Purif. **53** (2007) 264-269.

2006

Phan, T.T. , Nguyen, H.D., **Schumann, W.**

Novel plasmid-based expression vectors for intra- and extracellular
production of recombinant proteins in *Bacillus subtilis*.
Protein Expr. Purif. **46** (2006) 189-195.

Nguyen, H.D., **Schumann, W.**

Establishment of an experimental system allowing immobilization of

proteins on the surface of *Bacillus subtilis* cells.
J. Biotechnol. **123** (2006) 473-482.

Zellmeier, S., **Schumann, W.**, Wiegert, T.
Involvement of Clp protease in modulating the *Bacillus subtilis* sigma-W
stress response.
Mol. Microbiol. **61** (2006) 1569-1582.

Schumann, W.
Dynamics of the bacterial chromosome
Wiley-VCH (2006)

Paccez, J.D., Luiz, W.B., Sbrogio-Almeida, M.E., Ferreira, R.C.C.,
Schumann, W., Ferreira, L.C.S.
Stable episomal expression under control of a stress inducible promoter
enhances the immunogenicity of *Bacillus subtilis* as a vector for antigen
delivery
Vaccine **24** (2006) 2935-2943.

2005

Zellmeier, S., Hofmann, C., Thomas, S., Wiegert, T. **Schumann, W.**
Identification of σ^V -dependent genes of *Bacillus subtilis*
FEMS Microbiol. Lett. **253** (2005) 221-229.

Nguyen, H.D., Nguyen, Q.A., Ferreira, R.C., Ferreira, L.C.S., Tran, L.T.,
Schumann, W.
Construction of plasmid-based expression vectors for *Bacillus subtilis*
exhibiting full structural stability
Plasmid **54** (2005) 241-248.

Ferreira, L.C.S., Ferreira, R.C.C., **Schumann, W.**
Bacillus subtilis as a tool for vaccine development: from antigen factories
to delivery vectors
Annais da Acad. Brasil. Ciências **77** (2005) 1-12.

2004

Schumann, W., Ferreira, L.C.S.

Production of recombinant proteins in *Escherichia coli*
Genetics and Molecular Biology **27** (2004) 442-453.

Kotschwar, M., Harfst, E., Ohanjan, T., **Schumann, W.**

Construction and analyses of mutant *ftsH* alleles of *Bacillus subtilis*
involving the ATPase- and Zn-binding domains
Curr. Microbiol. **49** (2004) 180-185.

Wiegert, T., Hagmeier, K., **Schumann, W.**

Analysis of orthologous *hrcA* genes in *Escherichia coli* and *Bacillus subtilis*
FEMS Microbiol. Lett. **234** (2004) 9-17.

Schöbel, S., Zellmeier, S., **Schumann, W.**, Wiegert, T.

The *Bacillus subtilis* σ^W anti-sigma factor RsiW is degraded by
intramembrane proteolysis through YluC
Mol Microbiol. **52** (2004) 1091-1105.

Kotschwar, M., Diermeier, S., **Schumann, W.**

The *yjdB* gene of *Bacillus subtilis* codes for a protein being a novel
member of the AAA family
FEMS Microbiol. Lett. **230** (2004) 241-249.

2003

Schumann, W.

The *Bacillus subtilis* heat shock stimulon
Cell Stress & Chaperones **8** (2003) 207-210.

Atalla, A., **Schumann, W.**

The *pst* operon of *Bacillus subtilis* is specifically induced by alkali stress
J. Bacteriol. **185** (2003) 5019-5022.

Wiegert, T., **Schumann, W.**

Analysis of a DNA-binding motif of the *Bacillus subtilis* HrcA repressor
FEMS Microbiol. Lett. **223** (2003) 101-106.

Kobayashi, K. et al.

Essential *Bacillus subtilis* genes
Proc. Natl. Acad. Sci. USA **100** (2003) 4678-4683.

Zellmeier, S., Zuber, U., **Schumann, W.**, Wiegert, T.

The absence of FtsH metalloprotease activity causes overexpression of the

σ^W -controlled *pbpE* gene resulting in filamentous growth of *Bacillus subtilis*
J. Bacteriol. **184** (2003) 973-982.

Versteeg, S., Escher, A., Wende, A., Wiegert, T., **Schumann, W.**
Regulation of the *Bacillus subtilis* heat shock gene *htpG* is under positive control
J. Bacteriol. **185** (2003) 466-474.

2002

Reischl, S., Wiegert, T., **Schumann, W.**
Isolation and analysis of mutant alleles of the *Bacillus subtilis* HrcA repressor with reduced dependency on GroE function
J. Biol. Chem. **277** (2002) 32659-32667.

Kaltwasser, M., Wiegert, T., **Schumann, W.**
Construction and application of epitope- and green fluorescence protein-tagging integration vectors for *Bacillus subtilis*
Appl. Environ. Microbiol. **68** (2002) 2624-2628.

Schumann, W., Hecker, M., Msadek, T.
Regulation and function of heat-inducible genes in *Bacillus subtilis*
In *Bacillus subtilis* and Its Closest Relatives: from Genes to Cells. Edited by A.L. Sonenshein, J.A. Hoch & R. Losick. Washington DC: American Society for Microbiology (2002), pp. 367-376.

2001

Rajaram, H., Ballal, A.D. Apte, S.K., Wiegert, T., **Schumann, W.**
Cloning and characterization of the major *groESL* operon from nitrogen-fixing cyanobacterium *Anabaena* sp. strain L-31
Biochem. Biophys. Acta **1519** (2001) 143-146.

Wiegert, T., Homuth, G., Versteeg, S., **Schumann, W.**
Alkaline shock induces the *Bacillus subtilis* σ^W regulon
Mol. Microbiol. **41** (2001) 59-71.

Wiegert, T., **Schumann, W.**

SsrA-mediated tagging in *Bacillus subtilis*

J. Bacteriol. **183** (2001) 3885-3889.

Härtl, B., Wehrl, W., Wiegert, T., Homuth, G., **Schumann, W.**

Development of a new integration site within the *Bacillus subtilis* chromosome and construction of compatible expression cassettes

J. Bacteriol. **183** (2001) 2696-2699.

Schumann, W. The heat shock response. In: Encyclopedia of Life Sciences, Macmillan Reference Ltd., www.els.net. (2001)

Schumann, W. The cold shock response in microorganisms. In: Encyclopedia of Life Sciences, Macmillan Reference Ltd., www.els.net. (2001)

Reischl, S., Thake, S., Homuth, G., **Schumann, W.** Transcriptional analysis of three *Bacillus subtilis* genes coding for proteins with the alpha-crystallin domain characteristic of small heat shock proteins. FEMS Microbiol. Lett. **194** (2001) 99-103.

Ohanjan, T., **Schumann, W.**

Analysis of the mutant collection for defects in their temperature- and pH-shock response. pp. 277-279.

In: W. Schumann, D.S. Ehrlich, N. Ogasawara (eds.) Functional analysis of bacterial genes. John Wiley & Sons, Chichester, England (2001)

Schumann, W.

pH inducible genes. pp. 271-275.

In: W. Schumann, D.S. Ehrlich, N. Ogasawara (eds.) Functional analysis of bacterial genes. John Wiley & Sons, Chichester, England (2001)

Schumann, W.

The cold shock response. pp. 263-269.

In: W. Schumann, D.S. Ehrlich, N. Ogasawara (eds.) Functional analysis of bacterial genes. John Wiley & Sons, Chichester, England (2001)

Schumann, W., Hecker, M.

The heat shock response. pp. 251-262.

In: W. Schumann, D.S. Ehrlich, N. Ogasawara (eds.) Functional analysis of bacterial genes. John Wiley & Sons, Chichester, England (2001)

Schumann, W., Ehrlich, D.S., Ogasawara, N.

Functional analysis of bacterial genes

John Wiley & Sons, Chichester, England (2001)

2000

Schumann, W.

Function and regulation of temperature-inducible bacterial proteins on the cellular metabolism

Advances in Biochem. Engineering **67** (2000) 1-33.

Homuth, G. Domm, S., Kleiner, D., **Schumann, W.**

Transcriptional analysis of major heat shock genes of *Helicobacter pylori*

J. Bacteriol. **182** (2000) 4257-4263.

Wehrl, W., Niederweis, M., **Schumann, W.**

The FtsH protein accumulates at the septum of *Bacillus subtilis* during cell division and sporulation

J. Bacteriol. **182** (2000) 3870-3873.

1999

Homuth, G., Rompf, A., **Schumann, W.**, Jahn, D.

Transcriptional control of *Bacillus subtilis* *hemN* and *hemZ*

J. Bacteriol. **181** (1999) 5922-5929.

Homuth, G., Mogk, A., **Schumann, W.**

Post-transcriptional regulation of the *Bacillus subtilis* *dnaK* operon

Mol. Microbiol. **32** (1999) 1183-1197.

Versteeg, S., Mogk, A., **Schumann, W.**

The *Bacillus subtilis* *htpG* gene is not involved in thermal stress management

Mol. Gen. Genet. **261** (1999) 582-588.

Mogk, A., Bukau, B., Lutz, R., **Schumann, W.**

Construction and analysis of hybrid *Escherichia coli* and *Bacillus subtilis* *dnaK* genes

J. Bacteriol. **181** (1999) 1971-1974.

Schumann, W.

FtsH - a single-chain chaperone?

FEMS Microbiol. Lett. **23** (1999) 1-11.

1998

Magalhães, V.D., **Schumann, W.**, Castilho, B.A.
A new tetracycline resistance determinant cloned from *Proteus mirabilis*
BBA **1443** (1998) 262-266.

Tjalsma, H., Bolhuis, A., van Roosmalen, M.L., Wiegert, T., **Schumann, W.**, Broekhuizen, C.J., Quax, W.J., Venema, G., Bron, S., van Dijl, J.M.
Functional analysis of the secretory precursor processing machinery of *Bacillus subtilis*.
Genes Dev. **12** (1998) 2318-2331.

Schumann, W., Homuth, G., Mogk, A.
The GroE chaperonin machine is the major regulator of the CIRCE heat shock regulon of *Bacillus subtilis*
J. Biosci. **23** (1998) 415-422.

Mogk, A., Völker, A., Engelmann, S., Hecker, M., **Schumann, W.**, Völker, U.
Non-native proteins signal induction of the *Bacillus subtilis* CIRCE regulon
J. Bacteriol. **180** (1998) 2895-2900.

Melchers, K., Wiegert, T., Buhmann, A., Postius, S., Schäfer, K.P., **Schumann, W.**
The *Helicobacter felis* *ftsH* gene encoding an ATP-dependent metalloprotease can replace the *Escherichia coli* homologue for growth and phage λ lysogenization.
Arch. Microbiol. **169** (1998) 393-396.

1997

Hippler, B., Homuth, G., Hoffmann, T., Hungerer, C., **Schumann, W.**, Jahn, D.
Characterization of *Bacillus subtilis* *hemN*
J. Bacteriol. **179** (1997) 7181-7185.

Schumann, W.
Ein zweiter Hauptmechanismus zur Regulation der Hitzeschockantwort bei

Bakterien.

Biospektrum **3** (1997) 32-42.

Mogk, A., Homuth, G., Scholz, C., Kim, L., Schmid, F.X. **Schumann, W.**
The GroE chaperonin machine is a major modulator of the CIRCE heat shock regulon of *Bacillus subtilis*.

EMBO J. **16** (1997) 4579-4590.

Schumann, W.

Entdeckung eines neuen Mechanismus zur Regulation der Hitzeschockantwort bei Eubakterien.

Bioscope **5** (1997) 23-32.

Stoß, O., Mogk, A., **Schumann, W.**

Integrative vectors for constructing single-copy translational fusions between regulatory regions of *Bacillus subtilis* and the *bgaB* reporter gene encoding a heat-stable β -galactosidase.

FEMS Microbiol. Lett. **150** (1997) 49-54.

Mogk, A., **Schumann, W.**

Cloning and sequencing of the *hrcA* gene of *Bacillus stearothermophilus*.
Gene **194** (1997) 133-136.

Schulz, A., Schwab, S., Homuth, G., Versteeg, S., **Schumann, W.**

The *htpG* gene of *Bacillus subtilis* belongs to class III heat shock genes and is under negative control.

J. Bacteriol. **179** (1997) 3103-3109.

Deuerling, E., Mogk, A., Richter, C., Purucker, M., **Schumann, W.**

The *ftsH* gene of *Bacillus subtilis* is involved in major cellular processes such as sporulation, stress adaptation and secretion.

Mol. Microbiol. **23** (1997) 921-933.

Homuth, G., Masuda, S., Mogk, A., Kobayashi, Y., **Schumann, W.**

The *dnaK* operon of *Bacillus subtilis* is heptacistronic.

J. Bacteriol. **179** (1997) 1153-1164.

1996

Mogk, A., Hayward, R., **Schumann, W.**

Integrative vectors for constructing single-copy transcriptional fusions between *Bacillus subtilis* promoters and various reporter genes encoding

heat-stable enzymes.
Gene **182** (1996) 33-36.

Kim, L., Mogk, A., **Schumann, W.**
A xylose-inducible *Bacillus subtilis* integration vector and its application.
Gene **181** (1996) 71-76.

Schumann, W.
The heat shock stimulon of *Bacillus subtilis*.
Brazilian J. Genetics **19** (1996) 387-398.

Schumann, W.
Die molekulare Antwort auf Streß. Die Hitzeschock-Proteine und ihre Rolle
in Biologie und Medizin.
Mannheimer Forum 1996/97, S. 57-104.

Homuth, G., Heinemann, M., Zuber, U., **Schumann, W.**
The genes *lepA* and *hemN* form a bicistronic operon in *Bacillus subtilis*.
Microbiology **142** (1996) 1641-1649.

Schumann, W.
Vektoren für die Übertragung der genetischen Information, S. 126-155.
in H.G. Gassen und K. Minol, Gentechnik (überarbeitete Neuauflage), UTB,
Fischer Verlag, Stuttgart, 1996.

Schumann, W.
Regulation of the heat shock response in *Escherichia coli* and *Bacillus subtilis*.
J. Biosci. **21** (1996) 133-148.

Herbort, M., Schön, U., Angermann, K., Lang, J., **Schumann, W.**
Cloning and sequencing of the *dnaK* operon of *Bacillus stearothermophilus*.
Gene **170** (1996) 81-84.

Hecker, M., **Schumann, W.**, Völker, U.
Heat-shock and general stress response in *Bacillus subtilis*.
Mol. Microbiol. **19** (1996) 417-428.

Schulz, A., **Schumann, W.**
HrcA, the first gene of the *Bacillus subtilis dnaK* operon encodes a
negative regulator of class I heat shock genes.
J. Bacteriol. **178** (1996) 1088-1093.

Schön, U., **Schumann, W.**

Overproduction, purification and characterization of GroES and GroEL from thermophilic *Bacillus stearothermophilus*.

FEMS Microbiol. Lett. **134** (1995) 183-188.

Deuerling, E., Paeslack, B., **Schumann, W.**

The *ftsH* gene of *Bacillus subtilis* is transiently induced after osmotic and temperature upshift.

J. Bacteriol. **177** (1995) 4105-4112.

Schulz, A., Tzschaschel, B., **Schumann, W.**

Isolation and analysis of mutants of the *dnaK* operon of *Bacillus subtilis*.

Mol. Microbiol. **15** (1995) 421-429.

1994

Schön, U., **Schumann, W.**

Construction of His₆-tagging vectors allowing single-step purification of GroES and other polypeptides produced in *Bacillus subtilis*.

Gene **147** (1994) 91-94.

Schumann, W.

Funktion und Regulation der Hitzeschock-Proteine bei Pro- und Eukaryonten.

Bioscope **2** (1994) 20-24.

Zuber, U., **Schumann, W.**

CIRCE, a novel heat shock element involved in the regulation of the heat shock operon *dnaK* of *Bacillus subtilis*.

J. Bacteriol. **176** (1994) 1359-1363.

Hiller, B., Frey, B., **Schumann, W.**

Tn5Map, a transposon for the rapid mapping of restriction sites in plasmids.

FEMS Microbiol. Lett. **115** (1994) 151-156.

1993

Adams, R., **Schumann, W.**

Cloning and mapping of the *Bacillus subtilis* locus homologous to *Escherichia coli ent* genes.

Gene **133** (1993) 119-121.

Geisler, U., **Schumann, W.**

Isolation of stress mutants of *Bacillus subtilis* by a novel genetic method. FEMS Microbiol. Lett. **108** (1993) 251-254.

Schön, U., **Schumann, W.**

Molecular cloning, sequencing, and transcriptional analysis of the *groESL* operon from *Bacillus stearothermophilus*.

J. Bacteriol. **175** (1993) 2465-2469.

Zuber, U., **Schumann, W.**

The eighth copy of IS1 in *Escherichia coli* W3110 maps at 49.6 minutes.

J. Bacteriol. **175** (1993) 1552.

1992

Schumann, W., Zuber, U.

Regulation of the heat shock response in prokaryotes.

Ciência e Cultura **44** (1992) 287-291.

Schmidt, A., Schiesswohl, M., Völker, U., Hecker, M., **Schumann, W.**

Cloning, sequencing, mapping, and transcriptional analysis of the *groESL* operon from *Bacillus subtilis*.

J. Bacteriol. **174** (1992) 3993-3999.

Wetzstein, M., Völker, U., Dedio, J., Löbau, S., Zuber, U., Schiesswohl, M., Herget, C., Hecker, M., **Schumann, W.**

Cloning, sequencing, and molecular analysis of the *dnaK* locus from *Bacillus subtilis*.

J. Bacteriol. **174** (1992) 3300-3310.

Zuber, U., **Schumann, W.**

Tn5cos restriction mapping of large DNA plasmids.

In C. Kessler (ed.) Nonradioactive labeling and detection of biomolecules, Springer Verlag, S. 277-281 (1992).

1991

Schumann, W., Songür, N., Miltenburger, H.G.
Construction and evaluation of a *cea-lacZ* gene fusion for the detection of environmental mutagens and carcinogens.
FEMS Microbiol. Lett. **81**, (1991) 305-310.

Zuber, U., **Schumann, W.**
Tn5*cos*: a transposon for restriction mapping of large plasmids using phage lambda terminase.
Gene **103** (1991) 69-72.

Mayer, E., Mumenthey, K., **Schumann, W.**
A novel indicator system allows detection of point mutations conferring a Ner^- phenotype of phage Mu.
FEMS Microbiol. Lett. **78** (1991) 43-48.

1990

Wetzstein, M., **Schumann, W.**
Promoters of major *Escherichia coli* heat shock genes seem non-functional in *Bacillus subtilis*.
FEMS Microbiol. Lett. **72** (1990) 55-58.

Wetzstein, W., Dedio, J., **Schumann, W.**
Complete nucleotide sequence of the *Bacillus subtilis dnaK* gene.
Nucleic Acids Res. **18** (1990) 2172.

Wetzstein, M., **Schumann, W.**
Nucleotide sequence of a *Bacillus subtilis* gene homologous to the *grpE* gene of *E. coli* located immediately upstream of the *dnaK* gene.
Nucleic Acids Res. **18** (1990) 1289.

Schumann, W.
Biologie bakterieller Plasmide.
Lehrbuch; Friedrich Vieweg & Sohn, Wiesbaden (1990)

1989

Schumann, W.

Biotechnologie in Gegenwart und Zukunft an Beispielen. 2. Forschungs- und Anwendungsbereiche.

Studienbrief Biotechnologie, Deutsches Institut für Fernstudien an der Universität Tübingen (1989)

1988

Apfel, C., Mummenthey, K., **Schumann, W.**

Sequences at the right end of *Escherichia coli* phage Mu DNA influence expression of the early operon.

FEMS Microbiol. Lett. **55** (1988) 65-70.

Schumann, W.

Regulation der Transpositionsfunktionen beim *E. coli* Phagen Mu.

BioEngineering **4** (1988) 31-35.

Schumann, W.

Gentechnik in der Humangenetik: Menschen nach Maß?

Naturw. Rdsch. **41** (1988) 429-435.

Schumann, W.

Perspektiven der Gentechnologie in Grundlagenforschung und Anwendung.

UNIVERSITAS **43** (1988) 319-329.

Schumann, W.

Bakterielle Resistenzübertragung: Modell für Gentechnologie und Gentherapie?

in F. Schmidt (ed.) Neodarwinistische oder Kybernetische Evolution? S. 94-102 (1988)

König, U., Kirschner, P., **Schumann, W.**

Isolation of mutations of the phage Mu *ner* gene.

Virology **164** (1988) 75-80.

1987

Raps, H., **Schumann, W.**

Cloning of the *him* genes encoding the integration host factor from

Salmonella typhimurium in *E. coli*.
FEMS Microbiol. Lett. **48** (1987) 361-366.

Schumann, W.

Bacillus subtilis - ein gentechnologischer Mikroorganismus der zweiten Generation?
Forum Mikrobiologie **10** (1987) 201-208.

Simon, V., **Schumann, W.**

In vivo formation of gene fusions in *Pseudomonas putida* and construction of versatile broad-host-range vectors for direct subcloning of Mu *d1* and Mu *d2* fusions.
Appl. Environ. Microbiol. **53** (1987) 1649-1654.

1985

Schumann, W.

Vektoren für die Übertragung der genetischen Information.
in H.G. Gassen *et al.*, Gentechnik, UTB, Fischer Verlag, Stuttgart (1985)
S. 159-185.

1984

Schumann, W., Simon, V., Lögl, Ch.

The bacteriophage Mu gene *B* product is incorporated into the inner membrane of *Escherichia coli*.
Gene **29** (1984) 167-173.

1983

Schumann, W.

Der temperente *E. coli*-Phage Mu - Ein vielfältiges Werkzeug für den molekulargenetisch arbeitenden Mikrobiologen.
Forum Mikrobiologie **6** (1983) 340-349.

Schumann, W.

Bewegliche DNA-Sequenzen bei *Escherichia coli*.
Biuz **13** (1983) 137-143.

Staufenbiel, M., **Schumann, W.**

Cloning and characterization of restriction fragments of phage Mu DNA.
FEMS Microbiol. Lett. **20** (1983) 369-374.

Barlach, S., **Schumann, W.**

Mapping of binding sites for Mu repressor and *ner* product within the left-end *EcoRI*.C fragment of the Mu genome.
FEBS Lett. **157** (1983) 119-123.

Schumann, W.

Archaeobakterien - Zeugen aus der Frühgeschichte des Lebens?
in H. Plattner: Biologie aktuell, Band 2, Universitätsverlag Konstanz GmbH
(1983) S. 33-52.

1982

Schumann, W., Bade, E.G., Lögl, Ch.

Three phage-coded functions involved in the expression of bacteriophage Mu immunity.
Virology **117** (1982) 1-10.

1981

Schumann, W.

Bacteriocine.
Biuz **11** (1981) 65-70.

Clayton, R., **Schumann, W.**, Bade, E.G.

In vitro insertions and deletions in the G segment of phage Mu DNA do not abolish the inversion process.
Virology **109** (1981) 267-280.

1980

Schumann, W., Lögl, Ch.

Plasmid vectors derived from phage Mu allow direct selection of transformants containing cloned *HindIII* and *PstI* fragments.

Molec. Gen. Genet. **179** (1980) 369-372.

Schumann, W., Bade, E.G., Forgie, R.A., Howe, M.M.

Cloning of DNA fragments of the right end of phage Mu and location of the *HindIII*, *Sall*, *PstI*, and *BamHI* restriction sites on the genetic map of Mu.

Virology **104** (1980) 418-425.

Schumann, W.

Mechanismen der DNA-Reparatur.

Biuz **10** (1980) 33-38.

1979

Schumann, W.

Construction of an *HpaI* and *HindII* plasmid vector allowing direct selection of transformants harboring recombinant plasmids.

Molec. Gen. Genet. **174** (1979) 221-224.

Schumann, W., Westphal, Ch., Bade, E.G., Holzer, L.

Origin and binding specificity of protein(s) coded for by Mu prophages.

Molec. Gen. Genet. **173** (1979) 189-196.

Schumann, W.

Cloning and biological characterization of the immunity region of *Escherichia coli* Mu.

Gene **5** (1979) 275-290.

Schumann, W., Bade, E.G.

In vitro constructed plasmids containing both ends of bacteriophage Mu DNA express phage functions.

Molec. Gen. Genet. **169** (1979) 97-105.

1978

Schumann, W., Bade, E.G., Delius, H., Hübner, P.
Cloning of a restriction fragment of phage Mu DNA coding for early functions.
Molec. Gen. Genet. **160** (1978) 115-118.

Schumann, W.
Der Bakteriophage Mu - ein Riesentransposon.
Biologie in unserer Zeit **8** (1978) 180-187.

Schumann, W.
Erzeugung von auxotrophen *E. coli*-Mutanten mit dem temperenten Phagen Mu.
Biologie in unserer Zeit **8** (1978) 188-192.

1977

Schumann, W., Bade, E.G.
A *Salmonella typhimurium* endonuclease that converts native DNA to fragments of about 8×10^5 daltons.
J. Gen. Microbiol. **101** (1977) 319-325.

1976

Schumann, W., Lindenblatt, E., Bade, E.G.
Bacteriophage-specific DNA-binding proteins in P22-lysogenic and in P22-infected *Salmonella typhimurium*.
J. Virol. **20** (1976) 334-338.

1974

Schumann, W.
Comparative studies with *Culex pipiens* egg rafts. Immunogenetic, electrophoretic and enzymatic analysis of unfertilized, compatible and

incompatible fertilized eggs.

Theoret. Applied Genetics **44** (1974) 160-166.

Schumann, W.

Studies on the laboratory mating habits of the mosquito *Culex pipiens*.

J. Ent. (A) **49** (1974) 89-96.

1973

Schumann, W.

Immunogenetic and electrophoretic studies with extracts of different adult *Culex pipiens* strains.

J. Insect Physiol. **19** (1973) 1387-1396.