

Curriculum Vitae – Prof. Dr. Harald Schwalbe

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Education

1993-1995 Postdoctoral fellow at the Oxford Centre for Molecular Sciences, Oxford University (Mentor: C.M. Dobson, FRS)
1990-1993 Chemistry, University of Frankfurt, Germany, Ph.D. (summa cum laude; Mentor: C. Griesinger)
1985-1990 Chemistry, University of Frankfurt, Germany, Diploma (summa cum laude; Mentor: C. Griesinger)

Professional Career

2013- Member of the Board of Directors: Cluster of Excellence: Macromolecular Complexes
2012- Coordinator: DFG-funded Network of German NMR Centres
2012- Chairman of the Frankfurt section of the Society of German Chemists (GDCh)
2011- Speaker: DFG-SFB 902: "Molecular principles of RNA-based regulation"
2011- Chairman of the DFG panel: large equipment ("Apparatausschuß")
2009-2012 Speaker: DFG-Cluster of Excellence EXC115: "Macromolecular Complexes"
2009-2010 Member of the DFG panel: large equipment ("Apparatausschuß")
2007-2009 Speaker: DFG-SFB 579: "RNA-Ligand-Interactions"
2006-2008 Deputy Director: DFG-Center of Excellence: Macromolecular Complexes
2005-2011 Member of Senate of Goethe-University Frankfurt
2003- Coordinator of 5 EU funded programmes (STREPs, TOKs, Research Infrastructure for NMR (I3))
2002-2006 Managing Director of the Center for Biomolecular Magnetic Resonance, BMRZ
2003-2008 Head of the Department (Dekan) "Biochemistry, Chemistry and Pharmacy"
2002- Full Professor (C4), Institute for Organic Chemistry and Chemical Biology, University of Frankfurt
2001 Associate Professor for Biological Chemistry, Massachusetts Institute of Technology
1999-2001 Assistant Professor for Biological Chemistry, Massachusetts Institute of Technology
1995-1999 Work as Habilitand in Chemistry, University of Frankfurt (Mentor: C. Griesinger)

Honors and Awards

2012 Department Prize for Teaching, University Frankfurt
2006 1822-Prize for Teaching; University Frankfurt
2002- Vertrauensdozent of the "Studienstiftung des deutschen Volkes"
2001 Pew Scholar for Biomedical Sciences
2001 Fellow of the Alfred P. Sloan Foundation
2000 Karl Winnacker Preis of Aventis Foundation
1999 Gerhard Hess Preis of DFG
1996 Liebig Stipend of the Fonds der Chemischen Industrie
1993-1995 Human Capital and Mobility Fellow, EU.
1993 Studienabschlusspreis of the Fonds der Chemischen Industrie, Promotion
1989-1993 Member of the Graduate program: "Chemische und Biologische Synthese von Wirkstoffen", Institut für Organische Chemie, Frankfurt/Main.
1987-1990 Member of the "Studienstiftung des Deutschen Volkes"

Research Interests

Structural Biology of Proteins and RNA studied by NMR spectroscopy
Time-Resolved NMR spectroscopy
RNA Folding and Regulation
Protein Folding; non-native states of proteins
NMR-based drug design (kinases, phosphatases, GPCRs)
Synthesis of isotope labelled RNA, DNA, peptides and photolabile compounds

Member of Editorial Boards/Scientific Committees

ChemBioChem, Board of ISMAR (2002-2010), ICMRBS Council (2006-2016), Kuratorium des Strüngmann-Forums, Kuratorium der Rolf-Sammet-Stiftung, Kuratorium der Oswald- und Boris-Rajewski-Stiftung, Preiskommission der GDCh August-Wilhelm-von-Hofmann-Denk Münze, Preiskommission des Frankfurter Biophysikpreises der Oswald-Stiftung

Organization of Large International Conferences

2002 iLab: G-protein coupled receptors (together with G. Wess, Aventis)
2003 iLab: RNA targeting (together with G. Wess, Aventis, M. Göbel, Uni Frankfurt)
2004 iLab: Systems Biology challenges Chemistry (together with G. Wess, Aventis)
2007 ICMRBS Göttingen (co-organizer)
2009 GDCh Wissenschaftsforum Frankfurt (local organizer)
2011 EUROMAR Frankfurt (co-organizer), GDCh Wissenschaftsforum Bremen (scientific committee), International symposium of the German Society for Biochemistry and Molecular Biology (scientific committee)
2013 Elected Co-Chair Gordon Conference: Biopolymers

Scientific Advisory Boards

Center for Magnetic Resonance Florence
Henry Wellcome Center Birmingham
Frankfurt Institute for Advanced Studies (2005-2012)

Reviewing activity

DFG Germany, NWO Netherlands, FWO Austria, CNS France, Wellcome-Trust UK, BBSRC UK, National Science Foundation USA, NIH USA, Science Foundation Belgium, Excellence programme Slovenia, German Israel Foundation, Czech Science Foundation, Klaus-Tschira-Preis, DAAD

Accounts in Chemical Research, Angew. Chem. Int. Ed., Biochemistry, Bioorganic and Medicinal Chemistry, Biophysical J., ChemBioChem, ChemComm, Chemistry A European Journal, ChemPhysChem, Febs Lett., J. Am. Chem. Soc., J. Biomol. NMR, J. Chem. Theor. and Computation, J. Magn. Reson., J. Mol. Biol., J. Phys. Chem., Magnetic Resonance in Chemistry, Nature, Nucleic Acids Res., Proc. Natl. Acad. Sci. USA, RNA, Science, Structure.

10 most important publications

Protein Folding

H. Schwalbe, K.M. Fiebig, M. Buck, J.A. Jones, S.B. Grimshaw, S.J. Glaser, L.J. Smith, C.M. Dobson (1997) Structural and Dynamical Properties of Lysozyme Denatured in 8M Urea. Heteronuclear 3D NMR Experiments and Theoretical Simulations. *Biochemistry* **36**, 8977-8991.

J. Klein-Seetharaman, M. Oikawa, S.B. Grimshaw, J. Wirmer, E. Duchardt, T. Ueda, T. Imoto, L.J. Smith, C.M. Dobson, **H. Schwalbe** (2002) Long-range interactions within a non-native protein *Science* **295**, 1719-1722.

K. Schlepckow, **H. Schwalbe** (2013) Molecular Mechanism of Prion Protein Oligomerization at Atomic Resolution. *Angew. Chem. Intl. Ed.* **52**, 10002-10005.

RNA Folding and Regulation

P. Wenter, B. Fürtig, A. Hainard, **H. Schwalbe**, S. Pitsch (2005) Kinetic investigation of photoinduced RNA refolding by realtime NMR spectroscopy. *Angew. Chemie* **117**, 2656-2659.

J. Buck, B. Fürtig, J. Noeske, J. Wöhnert, **H. Schwalbe** (2007) Time-resolved NMR methods resolving ligand-induced RNA folding at atomic resolution. *Proc. Natl. Acad. Sci. USA* **104**, 15699-15704.

J. Rinnenthal, B. Klinkert, F. Narberhaus, **H. Schwalbe** (2010) Direct observation of the temperature induced melting process of the Salmonella fourU RNA thermometer at base-pair resolution. *Nucleic Acids Res.* **38**, 3834–3847.

A. Reining, S. Nozinovic, K. Schlepckow, F. Buhr, B. Fürtig, **H. Schwalbe** (2013) Three-state mechanism couples ligand and temperature sensing in riboswitches. *Nature* **499**, 355-359.

Membrane Proteins

J. Stehle, R. Silvers, K. Werner, D. Chatterjee, S. Gande, F. Scholz, A. Dutta, J. Wachtveitl, J. Klein-Seetharaman, **H. Schwalbe** (2014) Solution NMR characterization of simultaneous meta II and meta III decay kinetics in rhodopsin. *Angew. Chem. Intl. Ed.* **53**, 2078-2084.

NMR-based Drug Design

M. Vogtherr, K. Saxena, S. Hoelder, S. Grimme, M. Betz, U. Schieberr, B. Pescatore, M. Robin, T. Langer, K.U. Wendt, **H. Schwalbe** (2006) NMR-Characterization of kinase p38 dynamics in free and ligand bound form. *Angew. Chem. Intl. Ed.* **45**, 993-997.

C. Herbert, U. Schieberr, K. Saxena, J. Juraszek, F. De Smet, C. Alcouffe, M. Bianciotto, G. Saladino, D. Sibrac, D. Kudlinzki, S. Sreeramulu, A. Brown, P. Rigon, J.-P. Herault, G. Lassalle, T.L. Blundell, F. Rousseau, A. Gils, J. Schymkowitz, P. Tompa, J.-M. Herbert, P. Carmeliet, F.L. Gervasio, **H. Schwalbe***, F. Bono (2013) Molecular mechanism of SSR128129E, an extracellularly acting, small molecule, allosteric inhibitor of FGF receptor signaling. *Cancer Cell* **23**, 489-501.

List of Publications (peer-reviewed, no reviews)

2014

203. P. Sripakdeevong, M. Cevec, A. Chang, M. Erat, M. Ziegeler, Q. Zhao, G. Fox, X. Gao, S. Kennedy, R. Kierzek, E. Nikonowicz, **H. Schwalbe**, R. Sigel, D. Turner, R. Das (2014) Structure determination of noncanonical RNA motifs guided by ¹H NMR chemical shifts. *Nature Methods*, in press.

202. J. Kohl-Landgraf, F. Buhr, D. Lefrancois, J. Mewes, **H. Schwalbe**, J. Wachtveitl, A. Dreuw (2014) Mechanism of the Photoinduced Uncaging Reaction of Puromycin Protected by a 6-Nitroveratryloxycarbonyl Group. *J. Am. Chem. Soc.* **136**, 3430-3438.

201. J. Stehle, R. Silvers, K. Werner, D. Chatterjee, S. Gande, F. Scholz, A. Dutta, J. Wachtveitl, J. Klein-Seetharaman, **H. Schwalbe** (2014) Solution NMR characterization of simultaneous meta II and meta III decay kinetics in rhodopsin. *Angew. Chem. Intl. Ed.* **53**, 2078-2084.

200. H. Steinert, F. Schäfer, H. R.A. Jonker, A. Heckel*, **H. Schwalbe*** (2014) Influence of the absolute configuration of NPE-caged cytosine on DNA single base pair stability. *Angew. Chem. Intl. Ed.* **53**, 1072-1075.

2013

199. H. Nasiri, M. Madej, R. Panisch, J. Bats, M. Lafontaine, C.R. Lancaster, **H. Schwalbe** (2013) Design, Synthesis and Biological Testing of Novel Naphthoquinones as Substrate-Based Inhibitors of the Quinol:Fumarate Reductase from *Wolinella succinogenes*. *J. Med. Chem.* **56**, 9530-9541.

198. K. Schlepckow, **H. Schwalbe** (2013) Molecular Mechanism of Prion Protein Oligomerization at Atomic Resolution. *Angew. Chem. Intl. Ed.* **52**, 10002-10005 (VIP paper).

197. Y. Hiruma, M.A.S. Hass, Y. Kikui, W.-M. Liu, B. Ölmez, S.P. Skinner, A. Blok, A. Klosterman, H. Koteishi, F. Löhr, **H. Schwalbe**, M. Nojiri, M. Ubbink (2013) The Structure of the Cytochrome P450cam-Putidaredoxin Complex Determined by Paramagnetic NMR Spectroscopy and Crystallography. *J. Mol. Biol.* **425**, 4353-4365.

196. U. Schieborr, S. Sreeramulu, B. Elshorst, M. Maurer, K. Saxena, D. Kudlinzki, S. Gande, **H. Schwalbe** (2013) MOTOR: Model assisted Software for NMR Structure Determination. *Proteins* **81**, 2007-2022 (cover of the journal).

195. Y. P. Kumar, S. Bhowmik, R. N. Das, I. Bessi, S. Paladhi, R. Ghosh, **H. Schwalbe**, J. Dash (2013) A fluorescent guanosine dinucleoside as a selective switch-on sensor for c-myc G-quadruplex DNA with potent anticancer activities. *Chemistry – A European Journal* **19**, 11502-11506 (cover of the journal).

194. A. Reining, S. Nozinovic, K. Schlepckow, F. Buhr, B. Fürtig, **H. Schwalbe** (2013) Three-state mechanism couples ligand and temperature sensing in riboswitches. *Nature* **499**, 355-359 (see also highlight in *Nature: R. Micura: RNA biophysics: A three-state balancing act* 499, 289-290, see also highlight in *Nature: F. Narberhaus: RNAs at fiver pitch* 502, 178-9, see also: recommended by Faculty 1000).

193. G. Nielsen, H.R.A. Jonker, N. Vajpaj, S. Grzesiek, **H. Schwalbe** (2013) Kinase in motion: insights into the dynamic nature of p38 α by high pressure NMR spectroscopic studies. *ChemBioChem* **14**, 1799-1806.

192. A.L. Lieblein, B. Fürtig, **H. Schwalbe** (2013) Optimizing kinetics and thermodynamics of DNA i-motif folding. *ChemBioChem* **14**, 1226-1230.

191. C. Herbert, U. Schieborr, K. Saxena, J. Juraszek, F. De Smet, C. Alcouffe, M. Bianciotto, G. Saladino, D. Sibrac, D. Kudlinzki, S. Sreeramulu, A. Brown, P. Rigon, J.-P. Herault, G. Lassalle, T.L. Blundell, F. Rousseau, A. Gils, J. Schymkowitz, P. Tompa, J.-M. Herbert, P. Carmeliet, F.L. Gervasio, **H. Schwalbe***, F. Bono (2013) Molecular mechanism of SSR128129E, an extracellularly acting, small molecule, allosteric inhibitor of FGF receptor signaling. *Cancer Cell* **23**, 489-501 (featured in *Nat. Chem. Biol.*).

190. F. Bono, F. De Smet, C. Herbert, K. De Bock, M. Georgiadou, P. Fons, M. Tjwa, C. Alcouffe, A. Ny, M. Bianciotto, B. Jonckx, M. Murakami, A. A. Lanahan, C. Michielsen, D. Sibrac, F. Dol-Gleizes, M. Mazzone, S. Zacchigna, J.-P. Herault, C. Fischer, P. Rigon, C. Ruiz de Almodovar, F. Claes, I. Blanc, K. Poesen, J. Zhang, I. Segura, G. Gueguen, M.-F. Bordes, D. Lambrechts, R. Broussy, M. van de Wouwer, C. Michaux, T. Shimada, I. Jean, S. Blacher, A. Noel, P. Motte, E. Rom, J.-M. Rakic, S. Katsuma, P. Schaeffer, A. Yayon, A.

Van Schepdael, **H. Schwalbe**, F.L. Gervasio, G. Carmeliet, J. Rozensky, M. Dewerchin, M. Simons, A. Christopoulos, J.-M. Herbert, P. Carmeliet (2013) Inhibition of tumor angiogenesis and growth by a small – molecule multi-FGF receptor blocker with allosteric blockers. *Cancer Cell* **23**, 477-488.

189. J.A. Guan, P. Keizers, W.-M. Liu, F. Löhr, S. Skinner, E. Heeneman, **H. Schwalbe**, M. Ubbink, G. Siegal (2013) Small molecule binding sites on proteins established by paramagnetic NMR spectroscopy. *J. Am. Chem. Soc.* **135**, 5859-5869 (special significance by Faculty 1000).

188. R. Schweizer-Stenner, A. Hagarmann, S. Toal, D. Mathieu, **H. Schwalbe** (2013) Disorder and order in unfolded and disordered peptides and proteins: A view derived from tripeptide conformational analysis. I. Tripeptides with long and predominantly hydrophobic side chains. *Proteins* **81**, 955-967.

187. K. Rybka, S.E. Toal, D.J. Verbaro, D. Mathieu, **H. Schwalbe**, R. Schweizer-Stenner (2013) Disorder and order in unfolded and disordered peptides and proteins: A view derived from tripeptide conformational analysis. II. Tripeptides with short side chains populating an α and β -type like turn conformation. *Proteins* **81**, 968-983.

186. U. Schieborr, K. Saxena, B. Elshorst, **H. Schwalbe** (2013) ^1H , ^{13}C , and ^{15}N assignment of D2 domain of human fibroblast growth factor receptor 4. *Biomolecular NMR Assignments* **7**, 179-182.

2012

185. J. Stehle, F. Scholz, F. Löhr, S. Reckel, C. Roos, M. Blum, M. Braun, C. Glaubitz, V. Dötsch, J. Wachtveitl, **H. Schwalbe** (2012) Characterization of the ground state dynamics of proteorhodopsin by NMR and Optical Spectroscopies. *J. Biomol. NMR* **54**, 401-413.

184. R. Silvers, K. Saxena, D. Kudlinzki, **H. Schwalbe** (2012) Recombinant expression and purification of human TATA binding protein using a chimeric fusion. *Protein Expression and Purification* **85**, 142-147.

183. T. Stehle, Sridhar Sreeramulu, Frank Löhr, Christian Richter, Krishna Saxena, H.R.A. Jonker, **H. Schwalbe** (2012) The apo-structure of the low-molecular-weight protein tyrosine phosphatase A (MptpA) from *Mycobacterium tuberculosis* allows for better target-specific drug development. *J. Biol. Chem.* **287**, 34569-34582.

182. M. Ziegeler, M. Cevec, C. Richter, **H. Schwalbe** (2012) NMR Studies of HAR1 RNA Secondary Structures Reveal Conformational Dynamics in the Human RNA. *ChemBioChem* **13**, 2100-2112. (inside cover)

181. D.J. Verbaro, D. Mathieu, S.E. Toal, **H. Schwalbe**, R. Schweitzer-Stenner (2012) Ionized Trilycine: A Model System for Understanding the Non-Random Structure of Poly-L-Lysine and Lysine-Containing Motifs in Proteins. *J. Phys. Chem. B*, **116**, 8084-8094.

180. P. Rogne, P. Ozdowy, C. Richter, K. Saxena, **H. Schwalbe**, L. Kuhn (2012) Atomic-level structure characterization of an ultrafast folding mini-protein denatured state. *Plos One* **7**, e41301.

179. I. Bessi, C. Bazzicalupi, C. Richter, H.R.A. Jonker, K. Saxena, C. Sissi, M. Chioccioli, S. Bianco, A.R. Billia, **H. Schwalbe**, P. Gratteri (2012) Spectroscopic, molecular modeling and NMR-spectroscopic investigation of the binding mode of the natural alkaloids berberine and sanguinarine to human telomeric G-quadruplex DNA. *ACS Chemical Biology* **7**, 1109-1119.

178. A. Wacker, J. Buck, C. Richter, **H. Schwalbe**, J. Wöhnert (2012) Mechanisms for differentiation between cognate and near-cognate ligands by purine riboswitches. *RNA Biology* **9**, 672-680.

177. F. Sziegat, R. Silvers, M. Hähnke, M. Jensen, M. Blackledge, J. Wirmer-Bartoschek, **H. Schwalbe** (2012) Disentangling the coil: New insights into non-native protein states investigated by nuclear magnetic resonance spectroscopy. *Biochemistry* **51**, 3361-3372.

176. H. Angerer, H. R. Nasiri, V. Niedergesäß, S. Kirscher, **H. Schwalbe**, U. Brandt (2012) Tracing the tail of ubiquinone in mitochondrial complex I. *BBA Bioenergetics* **85**, 142-147.

175. R. Silvers, F. Sziegat, H. Tachibana, S.-I. Segawa, S. Whittaker, U. Günther, F. Gabel, J. Huang, M. Blackledge, J. Wirmer-Bartoschek, **H. Schwalbe** (2012) Modulation of Structure and Dynamics by Disulfide Bond Formation in Unfolded States. *J. Am. Chem. Soc.* **134**, 6846-6854 (special significance by Faculty 1000).

174. A.L. Lieblein, M. Krämer, A. Dreuw, B. Fürtig, **H. Schwalbe** (2012) The nature of the hydrogen bonds in Cytidine-H⁺-Cytidine DNA base pairs. *Angew. Chem. Int. Ed. Engl.* **51**, 4067-4070.

173. H. Steinert, J. Rinnenthal, **H. Schwalbe** (2012) Individual basepair stability of DNA and RNA studied by NMR-detected solvent exchange. *Biophysical J.* **102**, 2564-2574.

172. A.L. Lieblein, J. Buck, K. Schlepckow, B. Fürtig, **H. Schwalbe** (2012) Time-resolved NMR studies of DNA i-motif folding reveal kinetic partitioning. *Angew. Chem. Int. Ed. Engl.* **51**, 250-253. Zeitaufgelöste NMR-Untersuchungen zeigen einen kinetischen Partitionierungsmechanismus während der Faltung des DNA i-Motifs. *Angew. Chem.* **124**, 255-259.

171. A. Rosato, J.M. Aramini, C. Arrowsmith, A. Bagaria, D. Baker, A. Cavalli, J.F. Doreleijers, A. Eletsy, A. Giachetti, P. Guerry, A. Gutmanas, P. Güntert, Y. He, T. Herrmann, Y.J. Huang, V. Jaravine, H.R.A. Jonker, M.A. Kennedy, O.F. Lange, G. Liu, T.E. Malliavin, R. Mani, B. Mao, G.T. Montelione, M. Nilges, P. Rossi, G. van der Schot, **H. Schwalbe**, T.A. Szyperski, M. Vendruscolo, R. Vernon, W.F. Vranken, S. de Vries, G.W. Vuister, B. Wu, Y. Yang, A.M.J.J. Bonvin (2012) Blind testing of routine, fully automated determination of protein structures from NMR data. *Structure* **20**, 227-236.

2011

170. J. Kortmann, S. Sczodrok, J. Rinnenthal, **H. Schwalbe**, F. Narberhaus (2011) Translation on demand by a simple RNA-based thermosensor. *Nucleic Acids Res.* **39**, 2855-2868.

169. K. Barthelmes, A. Reynolds, E. Peizach, H.R.A. Jonker, N. Denunzio, K. Allen, B. Imperiali, **H. Schwalbe** (2011) Engineering encodable lanthanide-binding tags (LBTs) into loop positions of proteins. *J. Am. Chem. Soc.* **133**, 808-819 (special significance by Faculty 1000).

168. N.E. Englert, C. Richter, J. Wiesner, M. Hintz, H. Jomaa, **H. Schwalbe** (2011) NMR studies of DOXP reductoisomerase and its inhibitor complexes. *ChemBioChem*, **12**, 468-476.

167. H.R.A. Jonker, S. Baumann, A. Wolf, S. Schoof, F. Hiller, K.W. Schulte, K.N. Kirschner, **H. Schwalbe**, H.-D. Arndt (2011) NMR structures of thioestrepton derivatives report target shape recognition. *Angew. Chem. Int. Ed. Engl.* **50**, 3308-3312.

166. A. Hagarman, D. Mathieu, S. Toal, T.J. Measey, **H. Schwalbe**, R. Schweitzer-Stenner (2011) Amino Acids with Hydrogen Bonding Side Chains have an Intrinsic Tendency to Sample Various Turn Conformations in Aqueous Solution. *Chemistry, A European Journal* **17**, 6789-97.

165. S. Nozinovic, P. Gupta, B. Fürtig, C. Richter, S. Tüllmann, E. Ferner-Duchardt, M. Holthausen, **H. Schwalbe** (2011) 2'-OH group conformation in RNA derived from NMR spectroscopy and DFT calculations. *Angew. Chem. Int. Ed. Engl.* **50**, 5397-400; Konformationsbestimmung der 2'OH-Gruppe in RNA durch NMR-Spektroskopie und Dichtefunktionalrechnungen. *Angew. Chem.* **123**, 5509-5512.

164. F. Sziegat, J. Wirmer-Bartoschek, **H. Schwalbe** (2011) Unfolded state characteristics of Human Lysozyme and its disease related mutants. *Angew. Chem. Int. Ed. Engl.* **50**, 5514-5518.

163. A. Wacker, J. Buck, D. Mathieu, C. Richter, J. Wöhnert, **H. Schwalbe** (2011) Structure and dynamics of the deoxyguanosine-sensing riboswitch studied by NMR spectroscopy. *Nucleic Acids Res.* **39**, 6802-6812.

162. J. Rinnenthal, Birgit Klinkert, F. Narberhaus, **H. Schwalbe** (2011) Modulation of the stability of the Salmonella fourU-type RNA thermometer. *Nucleic Acids Res.* **39**, 8258-8270

161. J. Buck, A. Wacker, E. Warkentin, J. Wöhnert, J. Wirmer-Bartoschek, **H. Schwalbe** (2011) Influence of ground-state structure and Mg²⁺ binding on folding kinetics of the guanine-sensing riboswitch aptamer domain. *Nucleic Acids Res.* **39**, 9768-9778

160. D. B. Salvatore, N. Duraffourg, A. Favier, B.A. Persson, M. Lund, M. Delage, R. Silvers, **H. Schwalbe**, T. Croguennec, S. Bouhallab, V. Forge (2011) Investigation at residue level of the early steps during the assembly of two proteins into supramolecular objects. *Biomacromolecules* **12**, 2200-2210.

159. G. Nielsen, **H. Schwalbe** (2011) NMR spectroscopic investigations of the activated p38alpha mitogen-activated kinase. *ChemBioChem* **12**, 2599-2607.

158. S. Reckel, D. Gottstein, J. Stehle, F. Löhr, M.-K. Verhoefen, M. Takeda, R. Silvers, M. Kainosho, C. Glaubitz, J. Wachtveitl, F. Bernhard, **H. Schwalbe**, P. Güntert, V. Dötsch (2011) Solution NMR structure of proteorhodopsin. *Angew. Chem. Int. Ed. Engl.* **50**, 11942-11946.

2010

157. A. Hagarman, T. Measey, D. Mathieu, **H. Schwalbe**, R. Schweitzer-Stenner (2010) Intrinsic Propensities of Amino Acid Residues in GXG peptides Inferred from Amide I' Band Profiles and NMR Scalar Coupling Constants. *J. Am. Chem. Soc.* **132**, 540–551.

156. S. Nozinovic, B. Fürtig, H.R.A. Jonker, C. Richter, **H. Schwalbe** (2010) High-Resolution NMR Structure of a RNA model system: the 14mer cUUCGg tetraloop hairpin RNA. *Nucleic Acids Res.* **38**, 683-694.

155. M. Hähnke, C. Richter, F. Heinicke, **H. Schwalbe** (2010) The HN(COCA)HAHB-NMR Experiment for the Stereospecific Assignment of Hbeta-Protons in Non-native States of Proteins. *J. Am. Chem. Soc.* **132**, 918-919.

154. A. Doller, K. Schlepckow, **H. Schwalbe**, J. Pfeilschifter, W. Eberhardt (2010) Tandem phosphorylation of serine 221 and 318 by PKC d coordinates mRNA binding and nucleo-cytoplasmic shuttling of HuR. *Mol.Cell. Biol.* **30**, 1397-1410.

153. J. Buck, J. Noeske, J. Wöhnert, **H. Schwalbe** (2010) Mg²⁺ compensates for a missing long-range tertiary interaction in the guanine-sensing riboswitch aptamer domain. *Nucleic Acids Res.* **38**, 4143-4153.

152. J. Rinnenthal, B. Klinkert, F. Narberhaus, **H. Schwalbe** (2010) Direct observation of the temperature induced melting process of the Salmonella fourU RNA thermometer at base-pair resolution. *Nucleic Acids Res.* **38**, 3834–3847. (cover, featured article).

151. J. Kumar, S. Sreeramulu, T.-L. Schmidt, C. Richter, J. Vonck, A. Heckel, C. Glaubitz, **H. Schwalbe** (2010) Structural rearrangement during amyloid fibril formation of the human prion protein. *ChemBioChem* **11**, 1208-1213.

150. S. Nozinovic, C. Richter, J. Rinnenthal, B. Fürtig, E. Duchardt-Ferner, J.E. Weigand, **H. Schwalbe** (2010) Quantitative 2D and 3D Gamma-HCP Experiments for the Determination of the Angles alpha and zeta in the Phosphodiester Backbone of Oligonucleotides. *J. Am. Chem. Soc.* **132**, 10318-10329.

149. A. Cherepanov, C. Glaubitz, **H. Schwalbe** (2010) Hochauflösende Festkörper-NMR-Spektroskopie an ¹³C, ¹⁵N-markierter RNA. *Angew. Chem.* **122**, 4855–4859. A. Cherepanov, C. Glaubitz, **H. Schwalbe** (2010) High-Resolution Studies of Uniformly ¹³C, ¹⁵N-labeled RNA by Solid State NMR Spectroscopy. *Angew. Chem. Int. Ed. Engl.* **48**, 4747-4750.

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