

6. Literaturverzeichnis

- Alberts B, Bray D, Lewis J, Raff M, Roberts K, Watson JD:** Molekularbiologie der Zelle. 3. Auflage 1995, VCH Verlagsgesellschaft mbH Weinheim, 1. korrig. Nachdruck, 1997
- Ashraf H, Joyce L, Raza ST, Satchidanand S, Schimert G:** Clinical Advantages of Papaverine Cardioplegia. *Thorac Cardiovasc Surgeon* 1985; 33: 71-75
- Barner HB, Kaiser GC, Willmann VL:** Effect of nitroglycerin and papaverine on coronary flow in man. *Am Heart J* 1974; 88: 13-17
- Bartel S, Willenbrock R, Haase H, Karczewski P, Wallukat G, Dietz R, Krause EG:** Cyclic gmp-mediated phospholamban phosphorylation in intact cardiomyocytes. *Biochem Biophys Res Commun* 1995; 214: 75-80
- Beavo JA, Conti M, Heaslip RJ:** Multiple cyclic nucleotide phosphodiesterases. *Mol Pharmacol* 1994; 46: 399-405
- Beavo JA, Reifsnyder DH:** Primary sequence of cyclic nucleotide phosphodiesterase isozymes and the design of selective inhibitors. *Trends Pharmacol Sci* 1990; 11: 150-155
- Bolli R, Triana JF, Jeroudi MO:** Prolonged Impairment of Coronary Vasodilation After Reversible Ischemia; Evidence for Microvascular "Stunning". *Circ Res* 1990; 67: 332-343
- Broadley KJ:** The Langendorff Heart Preparation – Reappraisal of its Role as a Research and Teaching Model for Coronary Vasoactive Drugs. *J Pharmacol Meth* 1979; 2: 143-156
- Bünger R, Haddy FJ, Qerengässer A, Gerlach E:** An Isolated Guinea Pig Heart Preparation with in vivo like Features. *Pflügers Arch* 1974; 353: 317-326
- Chang KC, Chong WS, Lee IJ:** Different pharmacological characteristics of structurally similar benzylisoquinoline analogs, papaverine, higenamine, and GS 389, on isolated rat aorta and heart. *Can J Physiol Pharmacol* 1994; 72: 327-334
- de Cheffoy de Courcelles D, de Loore K, Freyne E, Janssen PAJ:** Inhibition of human cardiac cyclic AMP-phosphodiesterases by R 80122, a new selective cyclic AMP-phosphodiesterase III inhibitor: A comparison with other cardiotonic compounds. *J Pharm Exp Ther* 1992; 263: 6-14
- Cody RJ, Kubo SH, Covit AB:** Regional blood flow and neurohumoral response to chronic milrinone in CHF. *Circulation* 1984; 70: II-192
- Conway RS, Weiss HR:** Effect of Papaverine on Regional Cerebral Blood Flow and Small Vessel Blood Content. *Europ J Pharmacol* 1980; 68: 17-24
- Dotzer F:** Differentialtherapie mit Calciumantagonisten. *Fortschr Med* 1992; 110: Suppl 124
- Drummond G, Severson DL:** Cyclic Nucleotides and Cardiac Function. *Circ Res* 1979; 44: 145-153
- Dumont JE, Miot F, Erneux C, Couchie D, Couchaux P, Gervy-Decoster C, Van Sande J, Wells JN:** Negative Regulation of Cyclic AMP Levels by Activation of Cyclic Nucleotide Phosphodiesterases: The Example of the Dog Thyroid. *Adv Cyclic Nucleotide Protein Phosphorylation Res* 1984; 16: 325-336
- Eikens E, Wilcken DEL:** Myocardial Reactive Hyperemia and Coronar Vascular Reactivity in the Dog. *Circ Res* 1973; 33: 267-274
- Endoh M, Brodde OE, Schümann HJ:** Accumulation of cAMP and Positive Inotropic Effect Evoked by Isoproterenol Under the Graded Inhibition of Phosphodiesterase by Papaverine in the Isolated Rabbit Papillary Muscle. *J Mol Cell Cardiol* 1975; 7: 703-711

- Endoh M, Honma M:** Effects of Papaverine and Its Interaction with Isoprenaline and Carbachol on the Contractile Force and Cyclic Nucleotide Levels of the Canine Ventricular Myocardium. *Naunyn-Schmiedeberg's Arch Pharmacol* 1979; 306: 241-248
- Endoh M, Yamashita S, Taira N:** Positive Inotropic Effect of Amrinone in Relation to Cyclic Nucleotide Metabolism in the Canine Ventricular Muscle. *J Pharmacol Exp Therap* 1982; 221: 775-783
- Endoh M, Yanagisawa T, Taira N, Blinks JR:** Effects of new inotropic agents on cyclic nucleotide metabolism and calcium transients in canine ventricular muscle. *Circulation* 1986; 73 (suppl III): III-117-133
- Estler CJ:** Pharmakologie und Toxikologie. 4. Auflage, Schattauer Verlag Stuttgart, 1995
- Fawcett L, Baxendale R, Stacey P, McGrouther C, Harrow I, Sonderling S, Hetman J, Beavo JA, Phillips SC:** Molecular cloning and characterization of a distinct human phosphodiesterase gene family: PDE11A. *Proc Natl Acad Sci U S A* 2000; 97 (7): 3702-7
- Fischer DA, Smith JF, Pillar JS, St Denis SH, Cheng JB:** Isolation and characterization of PDE8A, a novel human cAMP-spezifische phosphodiesterase. *Biochem Biophys Res Commun* 1998; 246 (3): 570-577
- Fisher DA, Smith JF, Pillar JS, St. Denis SH, Cheng JB:** Isolation and characterization of PDE9A, a novel human cGMP-spezifische phosphodiesterase. *J Biol Chem* 1998; 273 (25): 15559-15564
- Forth W, Henschler D, Rummel W, Starke K:** Allgemeine und spezielle Pharmakologie und Toxikologie. 7. Auflage, Spektrum Akademischer Verlag Heidelberg, 1996
- Fricke G:** Herz. In: Pathophysiologie Phathobiochemie (Krück F, Hrsg.), 2. überarb. Auflage, Urban und Schwarzenberg, München, 1994: 7-13
- Galvan M, Schudt C:** Actions of the phosphodiesterase inhibitor zardaverine on guinea-pig ventricular muscle. *Naunyn-Schmiedeberg's Arch Pharmacol* 1990; 342: 221-227
- Han P, Zhu X, Michaeli T:** Alternative splicing of the high affinity cAMP-specific phosphodiesterase (PDE7A) mRNA in human skeletal muscle and heart. *J Biol Chem* 1997; 272 (26): 16152-16157
- Harrison SA, Reifsnyder DH, Gallis B, Cadd GG, Beavo JA:** Isolation and Characterization of Bovine Cardiac Muscle cGMP-Inhibited Phosphodiesterase: A Receptor for New Cardiotonic Drugs. *Mol Pharmacol* 1986; 29: 506-514
- Haslam RJ, Lynham JA:** Activation and inhibition of blood platelet adenylate cyclase by adenosine or by 2-chloroadenosine. *Life Sciences* 1972; 11: 1143-1154
- Hausmann H, Photiadis J, Ennker J, Hofmeister J, Schüler S, Loebe M, Friesewinkel O, Wagner F, Hetzer R:** Blutflußmessung der A. mammae nach Applikation von Papaverin in der Koronarchirurgie. *Z Herz-, Thorax-, Gefäßchir* 1994; 8: 200-204
- Hayashi M, Matsushima K, Ohashi H, Tsunoda H, Murase S, Kawarada Y, Tanaka T:** Molecular cloning and characterization of human PDE8B, a novel thyroid-specific isozyme of 3',5'-cyclic nucleotide phosphodiesterase. *Biochem Biophys Res Commun* 1998; 250 (3): 751-756
- Hayes JS, Wyss VL, Schenck KS, Cohen ML:** Effects of Prolonged Isoproterenol Infusion on Cardiac and Vascular Responses to Adrenoceptor Agonists. *J Pharmacol Exp Ther* 1986; 237: 757-763
- Henry PD, Dobson JG Jr, Sobel BE:** Dissociations between Changes in Myocardial Cyclic Adenosine Monophosphate and Contractility. *Circ Res* 1975; 36: 392-400

- Hetman JM, Sonderling SH, Glavas NA, Beavo JA:** Cloning and characterization of PDE7B, a cAMP-specific phosphodiesterase. *Proc Natl Acad Sci USA* 2000; 97 (1): 472-476
- Holzmann S, Meinertz T, Nawrath H, Scholz H:** Effect of Papaverine on Cyclic AMP, Calcium Uptake and Force of Contraction in Isolated Guinea Pig Auricles. *Res Commun Chem Pathol Pharmacol* 1977; 443-450
- Inoue T, Asahi S, Takayanagi K, Morooka S, Takabatake Y:** QT prolongation and possibility of ventricular arrhythmias after intracoronary papaverine. *Cardiology* 1994; 84: 9-13
- Kameyama M, Hescheler J, Hofmann F, Tautwein W:** Modulation of Ca current during the phosphorylation cycle in the guinea pig heart. *Pflügers Arch* 1986; 407: 123-128
- Karakullukçu YE, Özçelik T, Gökhan N:** Changes in cyclic nucleotides during the calcium paradox in the isolated rat heart. *Pflügers Arch* 1987; 410: 657-663
- Kauffmann RF, Crowe VG, Utterback BG, Robertson DW:** LY195115: A potent, selective inhibitor of cyclic nucleotide phosphodiesterase located in the sarcoplasmic reticulum. *Mol Pharmacol* 1986; 30: 609-616
- Klauss V, Mudra H, Sbarouni E, Meissner O, Metz J, Theisen K:** Myocardial contrast echocardiography for assessment of papaverine vasodilator response in patients with angiographically normal coronary arteries and in patients after orthotopic heart transplantation. *Z Kardiol* 1995; 84: 852-859
- Klinke R, Silbernagel S:** Lehrbuch der Physiologie. 2. Auflage, Georg Thieme Verlag Stuttgart, 1996
- Klockow M, Jonas R:** Particulate cAMP-specific phosphodiesterase (P-PDE) in cardiac ventricle of guinea pig. *Naunyn-Schmiedeberg's Arch Pharmacol* 1989; 339: R53
- Komas N, Lugnier C, Le Bec A, Serradeil-Le Gal C, Barthélémy G, Stoclet JC:** Differential Sensitivity to Cardiotonic Drugs of Cyclic AMP Phosphodiesterases Isolated from Canine Ventricular and Sinoatrial-Enriched Tissus. *J Cardiovasc Pharmacol* 1989; 14: 213-220
- Korth M:** Effects of Several Phosphodiesterase-Inhibitors on Guinea-Pig Myocardium. *Naunyn-Schmiedeberg's Arch Pharmacol* 1978; 302: 77-86
- Krebs HA, Henseleit K:** Untersuchungen über die Harnstoffbildung im Tierkörper. *Hoppe-Seyler's Z Physiol Chem* 1932; 210: 33-66
- Krück F:** Pathophysiologie Pathobiochemie. 2. überarb. Auflage, Urban und Schwarzenberg München, 1994
- Kühnberg M:** Eine elektronische Tropfenzählmethode zur kontinuierlichen Messung des Koronarflusses bei isolierten, arbeitenden Kleintierherzen. Dissertationsschrift der FU Berlin 1986
- Kukovetz WR, Pöch G:** Inhibition of cyclic-3',5'-nucleotide phosphodiesterase as a possible mode of action of papaverine and similarly acting drugs. *Naunyn-Schmiedeberg's Arch Pharmacol* 1970; 267: 189-194
- Kukovetz WR, Pöch G:** The Positive Inotropic Effect of Cyclic AMP. *Adv Cyclic Nucleotide Res* 1972; 1: 261-290
- Kukovetz WR, Pöch G, Wurm A:** Quantitative relations between cyclic AMP and contraction as affected by stimulators of adenylate cyclase and inhibitors of phosphodiesterase. *Adv Cyclic Nucleotide Res* 1975; 5: 395-414

- Kuo JF, Krueger BK, Sanes JR, Greengard P:** Cyclic nucleotide-dependent protein kinases. V. Preparation and properties of adenosine 3',5'-monophosphate-dependent protein kinase from various bovine tissues. *Biochim Biophys Acta* 1970; 212: 79-91
- Langendorff O:** Untersuchungen am überlebenden Säugetierherzen. *Pflügers Arch Ges Physiol* 1895; 61: 291-332
- Lathrop DA, Schwartz A:** Evidence for possible increase of sodium channel open time and involvement of Na/Ca exchange by a new positive inotropic drug: OPC-8212. *Eur J Pharmacol* 1985; 117: 391-397
- Le Peuch CJ, Haiech J, Demaille JG:** Concerted regulation of cardiac sarcoplasmic reticulum calcium transport by cyclic adenosine monophosphate dependent and calcium-calmodulin-dependent phosphorylations. *Biochemistry* 1979; 18: 5150-5157
- Le Peuch CJ, Le Peuch DA-M, Demaille JG:** Ca^{2+} -calmodulin-dependent phospholamban kinase from cardiac sarcoplasmic reticulum is distinct from phosphorylase kinase and forms a regulatory complex with phospholamban and the Ca^{2+} -ATPase. *Ann N Y Acad Sci* 1982; 549:556
- Löffler G, Petrides PE:** Biochemie und Pathobiochemie. 6. Auflage, Springer Verlag Berlin Heidelberg, 1998
- Lugnier C, Stoclet JC:** Inhibition by papaverine of cGMP and cAMP phosphodiesterases from the rat heart. *Bioch Pharmacol* 1974; 23: 3071-3074
- McNeill JH, Brenner MJ, Muschek LD:** Interaction of four methylxanthine compounds and norepinephrine on cardiac phosphorylase activation and cardiac contractility. In: Recent Advances in Cardiac Structure and Metabolism, vol. 3, Myocardial Metabolism. Baltimore, University Park Press 1973, pp 261-273
- Martin W, Furchtgott RF, Villani GM, Jothianandan D:** Phosphodiesterase Inhibitors Induce Endothelium-Dependent Relaxation of Rat and Rabbit Aorta by Potentiating the Effects of Spontaneously Released Endothelium-Derived Relaxing Factor. *J Pharmacol Exp Ther* 1986; 237: 539-547
- Meinertz T, Nawrath H, Scholz H, Winter K:** Effect of DB-c-AMP on Mechanical Characteristics of Ventricular and Atrial Preparations of Several Mammalian Species. *Naunyn-Schmiedeberg's Arch Pharmacol* 1973; 282: 143-153
- Miller DJ, Steele DS:** The 'calcium sensitising' effects of ORG30029 in saponin- or Triton-skinned rat cardiac muscle. *Br J Pharmacol* 1990; 100: 843-849
- Mubagwa K, Shirayama T, Moreau M, Pappano AJ:** Effects of PDE inhibitors and carbachol on the L-type Ca current in guinea pig ventricular myocytes. *Am J Physiol* 1993; 265: H1353-H1363
- Muller B, Lugnier C, Stoclet JC:** Involvement of Rolipram-Sensitive Cyclic AMP Phosphodiesterase in the Regulation of Cardiac Contraction. *J Cardiovasc Pharmacol* 1990; 16: 796-803
- Mutschler E:** Arzneimittelwirkungen: Lehrbuch der Pharmakologie und Toxikologie. 7. Auflage, Wissenschaftliche Verlagsgesellschaft mbH Stuttgart, 1996
- Nawrath H:** Cyclic AMP and cyclic GMP may play opposing roles in influencing force of contraction in mammalian myocardium. *Nature* 1976; 262: 509-511
- Nawrath H:** Papaverine decreases the efflux of ^{42}K in guinea-pig atrial heart muscle. *Naunyn-Schmiedeberg's Arch Pharmacol* 1980; 312: 183-185

- Nawrath H, Meinertz T:** Electrical and Mechanical Activity of Mammalian Heart Muscle Fibres Treated with Papaverine. *Naunyn-Schmiedeberg's Arch Pharmacol* 1977; 299: 253-258
- Neely JR, Liebermeister H, Battersby EJ, Morgan HE:** Effect of pressure development on oxygen consumption by isolated rat heart. *Am J Physiol* 1967; 212: 804-814
- Neely JR, Rovetto MJ:** Techniques for Perfusion Isolated Rat Hearts. *Methods Enzymol* 1975; 39: 43-60
- Nicholson CD, Challis RAJ, Shahid M:** Differential modulation of tissue function and therapeutic potential of selective inhibitors of cyclic nucleotide phosphodiesterase isoenzymes. *Trends Pharmacol Sci* 1991; 12: 19-27
- Oberdisse H, Hackenthal E, Kuschinsky K:** Pharmakologie und Toxikologie. Springer Verlag Berlin Heidelberg, 1997
- Pérez JE, Borda L, Schuchleib R, Henry PD:** Inotropic and Chronotropic Effects of Vasodilators. *J Pharm Exp Ther* 1982; 221: 609-613
- Pöch G, Kukovetz WR:** Papaverine-Induced Inhibition of Phosphodiesterase Activity in Various Mammalian Tissues. *Life Sciences* 1971; 10: 133-144
- Rapundalo ST:** Cardiac protein phosphorylation: functional and pathophysiological correlates. *Cardiovasc Res* 1998; 38 (3): 559-588
- Reinhardt D, Roggenbach W, Brodde OE, Schümann HJ:** Influence of Papaverine and Isoprenaline on Contractility and Cyclic AMP Level of Left Guinea-Pig Atria at Different Rates of Beat. *Naunyn-Schmiedeberg's Arch Pharmacol* 1977; 299: 9-15
- Roberts AJ, Hay DA, Metha JL, Metha P, Roy L, Faro RS, Knauf DG:** Biochemical and ultrastructural integrity of the saphenous vein conduit during coronary artery bypass grafting; Preliminary results of the effect of papaverine. *J Thorac Cardiovasc Surg* 1984; 88: 39-48
- Saborowski F:** Postinfarkttherapie. In: Interventionen am Herzen (Unger F, Mörl H, Dieterich HA, Hrsg.) Springer Verlag Berlin Heidelberg 1995, 147-153
- Saborowski F, Peters P, Schneider M:** Hämodynamisches Profil von Amrinon und Exenatide bei Patienten mit schwerer Herzinsuffizienz. *Z Kardiol* 1991; (Suppl 4) 80: 63-68
- Sachs L:** Angewandte Statistik. , 6. Auflage, Springer Verlag Berlin Heidelberg, 1984
- Scheld HH, Deiwick M, Rötke J:** Arterielle Grafts. In: Interventionen am Herzen (Unger F, Mörl H, Dieterich HA, Hrsg.) Springer-Verlag Berlin Heidelberg 1995, 128-146
- Schmidt RF, Thews G:** Physiologie des Menschen. 27. Auflage, Springer Verlag Berlin Heidelberg, 1997
- Schneider JA, Brooker G, Sperelakis N:** Papaverine blockade of an inward slow Ca^{++} -current in guinea pig heart. *J Mol Cell Cardiol* 1975; 7: 867-876
- Schönenfeld B:** Glukagonwirkung an isoliert arbeitenden Ratten- und Meerschweinchenherzen bei unterschiedlichen Kalziumkonzentrationen. Dissertationsschrift der FU Berlin 1996
- Scholz H:** Mechanisms of positive inotropic effects. *Basic Res Cardiol* 1989; 84 Suppl 1: 3-7
- Scholz H, Dieterich HA, Schmitz W:** Zum Mechanismus der positiv inotropen Wirkung von Phosphodiesterasehemmstoffen. *Z Kardiol* 1991 (Suppl 4); 80:1-6
- Schopohl J, Haen E, Traugott U, Gärtner R:** Serie: Sexuelle Funktionsstörungen, Sildenafil (Viagra). *Deutsches Ärzteblatt* 2000; 97: C-244-C-248

- Schrader J, Baumann G, Gerlach E:** Adenosine as Inhibitor of Myocardial Effects of Catecholamines. *Pflügers Arch* 1977; 372: 29-35
- Shah AM, Spurgeon HA, Sollot SJ, Talo A, Lakatta EG:** 8-Bromo-cGMP Reduces the Myofilament Response to Ca^{2+} in Intact Myocytes. *Circ Res* 1994; 74: 970-978
- Shahid M, Cottney JC, Nicholson CD, Marshall RJ, Bruin JC, McIndewar I, Walker GB, Dickson M, Wylie K, Fisher D:** The biochemical effects of Org 30029 in cardiac and vascular tissues. *Br J Pharmacol* 1989; 96: 186P
- Silver PJ:** Biochemical Aspects of Inhibition of Cardiovascular Low (K_m) Cyclic Adenosine Monophosphate Phosphodiesterase. *Am J Cardiol* 1989; 63: 2A-8A
- Sonderling SH, Bayuga SJ, Beavo JA:** Isolation and characterization of a dual-substrate phosphodiesterase gene family: PDE10A. *Proc Natl Acad Sci USA* 1999; 96 (12): 7071-6
- Sonderling SH, Bayuga SJ, Beavo JA:** Identification and characterization of a novel family of cyclic nucleotide phosphodiesterases. *J Biol Chem* 1998; 273 (25): 15553-15558
- Stefenelli T:** Positiv inotrope Substanzen in der Therapie der Herzinsuffizienz: Digitalis, Katecholamine, Phosphodiesteraseinhibitoren. *Acta Med Austriaca* 1991; 18 (4): 81-85
- Sumii K, Sperelakis N:** cGMP-Dependent Protein Kinase Regulation of the L-Type Ca^{2+} Current in Rat Ventricular Myocytes. *Circ Res* 1995; 77: 803-812
- Stryer L:** Biochemie. 4. Auflage, Spektrum Akademischer Verlag Heidelberg Berlin, 1995
- Taegtmeyer H, Hems R, Krebs HA:** Utilization of Energy-Providing Substrates in the Isolated Working Rat Heart. *Biochem J* 1980; 186: 701-711
- Tada M, Kirchberger MA, Iorio JM, Katz AM:** Control of Cardiac Sarcolemmal Adenylate Cyclase and Sodium, Potassium-Activated Adenosinetriphosphatase Activities. *Circ Res* 1975; 36: 8-17
- Thormann J:** Bedeutung der Inotropiemessungen in der Klinik. In: Interventionen am Herzen Herzen (Unger F, Mörl H, Dieterich HA, Hrsg.) Springer Verlag Berlin Heidelberg 1995, 384-410
- Unger F, Mörl H, Dieterich HA:** Interventionen am Herzen. 1. Auflage, Springer Verlag Berlin Heidelberg, 1995
- Van Meel JC:** Effects of some cardiotonic agents on contractility of skinned fibers from mammalian heart. *Arzneim-Forsch Drug Res* 1987; 37: 679-687
- Watanabe AM, Besch HR Jr:** Interaction between Cyclic Adenosine Monophosphate and Cyclic Guanosine Monophosphate in the Guinea Pig Ventricular Myocardium. *Circ Res* 1975; 37: 309-317
- Weishaar RE, Kobylarz-Singer DC, Steffen RP, Kaplan HR:** Subclasses of cyclic AMP-specific phosphodiesterase in left ventricular muscle and their involvement in regulating myocardial contractility. *Circ Res* 1987; 61: 539-547
- Weishaar RE, Quade MM, Schenden JA, Evans DB:** Relationship between inhibition of cardiac muscle phosphodiesterases, changes in cyclic nucleotide levels, and contractile response for Cl-914 and other novel cardiotonics. *J Cyclic Nucleotide Protein Phosphor Res* 1985; 10: 551-64
- Werner J:** Biomathematik und medizinische Statistik. 2. überarb. Auflage, Urban und Schwarzenberg Verlag München, 1992

Danksagung

Herrn Prof. Dr. H.D. Schmidt danke ich für die Vergabe des Dissertationsthemas und besonders für die hervorragende Betreuung sowie für sein stetiges Interesse am Fortgang der Arbeit, die er mit Rat, Tat, Geduld und konstruktiver Kritik in auch kurzfristig ermöglichten Gesprächsterminen unterstützt hat.

Weiterhin möchte ich mich bei Frau Renate Sommer bedanken, die mich in die verschiedenen Abschnitte von Versuchsvorbereitung bis Versuchsende mit vielen praktischen Tips einarbeitete. Dank gebührt Herrn Dipl. Ing. Jürgen Palow und Herrn Dipl. Ing. Dietrich Klüßendorf für die Hilfestellung bzgl. Computertätigkeit und statistischer Auswertung.

Allen zur Arbeitsgruppe von Prof. Schmidt gehörenden Mitarbeitern sei herzlich gedankt für die freundliche, motivierende und kompetente Betreuung in einer durchweg angenehmen Arbeitsatmosphäre.

Ein großes Dankeschön möchte ich meinen Eltern aussprechen, welche mich bei der Bearbeitung der Dissertation in jeglicher Hinsicht unermüdlich förderten und unterstützten. Dem ermunternden, emotionalen Beistand meines Ehemannes Henning Kontny bin ich sehr dankverpflichtet. Auch meinen Schulfreunden Gabriele Otto und Richard Götz danke ich für die ständig präsente, geistige, bestärkende und ermunternde Hilfe besonders in streckenweise entbehrungsreichen Zeiten während der Promotion.