

7 Literaturverzeichnis

1. Hucho, F., Weise, C., *Ligand-Gated Ion Channels*. Angew. Chem. Int. Ed. (2001), **40**, 3100-16.
2. Leonard, S., Bertrand, D., *Neuronal nicotinic receptors: from structure to function*. Nicotine Tob Res (2001), **3**, 203-23.
3. LeNovère, N., Changeux, J. P., *Molecular evolution of the nicotinic acetylcholine receptor: an example of multigene family in excitable cells*. Proc Natl Acad Sci U S A (1995), **79**, 2406-09.
4. Hucho, F., Tsetlin, V. I., Machold, J., *The emerging three-dimensional structure of a receptor. The nicotinic acetylcholine receptor*. Eur J Biochem (1996), **239**, 539-57.
5. Unwin, N., *Nicotinic acetylcholine receptor at 9 Å resolution*. J Mol Biol (1993), **229**, 1101-24.
6. Miyazawa, A., Fujiyoshi, Y., Stowell, M., Unwin, N., *Nicotinic acetylcholine receptor at 4.6 Å resolution: transverse tunnels in the channel wall*. J Mol Biol (1999), **288**, 765-86.
7. Tierney, M. L., Unwin, N., *Electron microscopic evidence for the assembly of soluble pentameric extracellular domains of the nicotinic acetylcholine receptor*. J Mol Biol (2000), **303**, 185-96.
8. Schratzenholz, A., Pfeiffer, S., Pejovic, V., Rudolph, R., Godovac-Zimmermann, J., Maelicke, A., *Expression and renaturation of the N-terminal extracellular domain of torpedo nicotinic acetylcholine receptor alpha-subunit*. J Biol Chem (1998), **273**, 32393-9.
9. Alexeev, T., Krivoshein, A., Shevalier, A., Kudelina, I., Telyakova, O., Vincent, A., Utkin, Y., Hucho, F., Tsetlin, V., *Physicochemical and immunological studies of the N-terminal domain of the Torpedo acetylcholine receptor alpha-subunit expressed in Escherichia coli*. Eur J Biochem (1999), **259**, 310-9.
10. Fischer, M., Corringer, P. J., Schott, K., Bacher, A., Changeux, J. P., *A method for soluble overexpression of the alpha 7 nicotinic acetylcholine receptor extracellular domain*. Proc Natl Acad Sci USA (2001), **98**, 3567-70.
11. Grant, M. A., Gentile, L. N., Shi, Q. L., Pellegrini, M., Hawrot, E., *Expression and spectroscopic analysis of soluble nicotinic acetylcholine receptor fragments derived from the extracellular domain of the alpha-subunit*. Biochemistry (1999), **38**, 10730-42.
12. Yao, Y., Wang, J., Viroonchatapan, N., Samson, A., Chill, J., Rothe, E., Anglister, J., Wang, Z. Z., *Yeast expression and NMR analysis of the extracellular domain of muscle nicotinic acetylcholine receptor alpha subunit*. J Biol Chem (2002).
13. West, A. P., Jr., Bjorkman, P. J., Dougherty, D. A., Lester, H. A., *Expression and circular dichroism studies of the extracellular domain of the alpha subunit of the nicotinic acetylcholine receptor*. J Biol Chem (1997), **272**, 25468-73.
14. Le Novere, N., Corringer, P. J., Changeux, J. P., *Improved secondary structure predictions for a nicotinic receptor subunit: incorporation of solvent accessibility and experimental data into a two-dimensional representation*. Biophys J (1999), **76**, 2329-45.
15. Gorne-Tschelnokow, U., Hucho, F., Naumann, D., Barth, A., Mantele, W., *Fourier transform infrared (FTIR) spectroscopic investigation of the nicotinic acetylcholine receptor (nAChR). Investigation of agonist binding and*

- receptor conformational changes by flash-induced release of 'caged' carbamoylcholine.* FEBS Lett (1992), **309**, 213-7.
16. Gorne-Tschelnokow, U., Strecker, A., Kaduk, C., Naumann, D., Hucho, F., *The transmembrane domains of the nicotinic acetylcholine receptor contain alpha-helical and beta structures.* Embo J (1994), **13**, 338-41.
 17. Hucho, F., Gorne-Tschelnokow, U., Strecker, A., *Beta-structure in the membrane-spanning part of the nicotinic acetylcholine receptor (or how helical are transmembrane helices?).* Trends Biochem Sci (1994), **19**, 383-7.
 18. Naumann, D., Schultz, C., Gorne-Tschelnokow, U., Hucho, F., *Secondary structure and temperature behavior of the acetylcholine receptor by Fourier transform infrared spectroscopy.* Biochemistry (1993), **32**, 3162-8.
 19. Corringer, P. J., Le Novere, N., Changeux, J. P., *Nicotinic receptors at the amino acid level.* Annu Rev Pharmacol Toxicol (2000), **40**, 431-58.
 20. Smit, A. B., Syed, N. I., Schaap, D., van Minnen, J., Klumperman, J., Kits, K. S., Lodder, H., van der Schors, R. C., van Elk, R., Sorgedragger, B., Brejc, K., Sixma, T. K., Geraerts, W. P., *A glia-derived acetylcholine-binding protein that modulates synaptic transmission.* Nature (2001), **411**, 261-8.
 21. Brejc, K., van Dijk, W. J., Klaassen, R. V., Schuurmans, M., van Der Oost, J., Smit, A. B., Sixma, T. K., *Crystal structure of an ACh-binding protein reveals the ligand-binding domain of nicotinic receptors.* Nature (2001), **411**, 269-76.
 22. Le Novere, N., Grutter, T., Changeux, J. P., *Models of the extracellular domain of the nicotinic receptors and of agonist- and Ca²⁺-binding sites.* Proc Natl Acad Sci U S A (2002), **99**, 3210-5.
 23. Colledge, M., Froehner, S. C., *Signals mediating ion channel clustering at the neuromuscular junction.* Curr Opin Neurobiol (1998), **8**, 357-63.
 24. Schroeder, W., Meyer, H. E., Buchner, K., Bayer, H., Hucho, F., *Phosphorylation sites of the nicotinic acetylcholine receptor. A novel site detected in position delta S362.* Biochemistry (1991), **30**, 3583-8.
 25. Dai, Z., Peng, H. B., *A role of tyrosine phosphatase in acetylcholine receptor cluster dispersal and formation.* J Cell Biol (1998), **141**, 1613-24.
 26. Balasubramanian, S., Haganir, R. L., *Characterization of phosphotyrosine containing proteins at the cholinergic synapse.* FEBS Lett (1999), **446**, 95-102.
 27. Mohamed, A. S., Swope, S. L., *Phosphorylation and cytoskeletal anchoring of the acetylcholine receptor by Src class protein-tyrosine kinases. Activation by rapsyn.* J Biol Chem (1999), **274**, 20529-39.
 28. Dreger, M., Krauss, M., Herrmann, A., Hucho, F., *Interactions of the nicotinic acetylcholine receptor transmembrane segments with the lipid bilayer in native receptor-rich membranes.* Biochemistry (1997), **36**, 839-47.
 29. Ramarao, M. K., Cohen, J. B., *Mechanism of nicotinic acetylcholine receptor cluster formation by rapsyn.* Proc Natl Acad Sci U S A (1998), **95**, 4007-12.
 30. Kassner, P. D., Conroy, W. G., Berg, D. K., *Organizing effects of rapsyn on neuronal nicotinic acetylcholine receptors.* Mol Cell Neurosci (1998), **10**, 258-70.
 31. Bezakova, G., Bloch, R. J., *The zinc finger domain of the 43-kDa receptor-associated protein, rapsyn: role in acetylcholine receptor clustering.* Mol Cell Neurosci (1998), **11**, 274-88.
 32. Maimone, M. M., Enigk, R. E., *The intracellular domain of the nicotinic acetylcholine receptor alpha subunit mediates its coclustering with rapsyn.* Mol Cell Neurosci (1999), **14**, 340-54.

33. Ramarao, M. K., Bianchetta, M. J., Lancken, J., Cohen, J. B., *Role of rapsyn tetratricopeptide repeat and coiled-coil domains in self-association and nicotinic acetylcholine receptor clustering*. J Biol Chem (2001), **276**, 7475-83.
34. Bartoli, M., Ramarao, M. K., Cohen, J. B., *Interactions of the rapsyn RING-H2 domain with dystroglycan*. J Biol Chem (2001), **276**, 24911-7.
35. Wang, H., Bedford, F. K., Brandon, N. J., Moss, S. J., Olsen, R. W., *GABA(A)-receptor-associated protein links GABA(A) receptors and the cytoskeleton*. Nature (1999), **397**, 69-72.
36. Sassoe-Pognetto, M., Fritschy, J. M., *Mini-review: gephyrin, a major postsynaptic protein of GABAergic synapses*. Eur J Neurosci (2000), **12**, 2205-10.
37. Ramming, M., Kins, S., Werner, N., Hermann, A., Betz, H., Kirsch, J., *Diversity and phylogeny of gephyrin: tissue-specific splice variants, gene structure, and sequence similarities to molybdenum cofactor-synthesizing and cytoskeleton-associated proteins*. Proc Natl Acad Sci U S A (2000), **97**, 10266-71.
38. Kennedy, M. B., *Signal-processing machines at the postsynaptic density*. Science (2000), **290**, 750-4.
39. Valtschanoff, J. G., Weinberg, R. J., *Laminar organization of the NMDA receptor complex within the postsynaptic density*. J Neurosci (2001), **21**, 1211-7.
40. Nimnual, A. S., Chang, W., Chang, N. S., Ross, A. F., Gelman, M. S., Prives, J. M., *Identification of phosphorylation sites on AChR delta-subunit associated with dispersal of AChR clusters on the surface of muscle cells*. Biochemistry (1998), **37**, 14823-32.
41. Chen, G. Q., Sun, Y., Jin, R., Gouaux, E., *Probing the ligand binding domain of the GluR2 receptor by proteolysis and deletion mutagenesis defines domain boundaries and yields a crystallizable construct*. Protein Sci (1998), **7**, 2623-30.
42. Armstrong, N., Sun, Y., Chen, G. Q., Gouaux, E., *Structure of a glutamate-receptor ligand-binding core in complex with kainate*. Nature (1998), **395**, 913-7.
43. Mayer, M. L., Olson, R., Gouaux, E., *Mechanisms for ligand binding to GluR0 ion channels: crystal structures of the glutamate and serine complexes and a closed apo state*. J Mol Biol (2001), **311**, 815-36.
44. Cheng, Q., Thiran, S., Yernool, D., Gouaux, E., Jayaraman, V., *A vibrational spectroscopic investigation of interactions of agonists with GluR0, a prokaryotic glutamate receptor*. Biochemistry (2002), **41**, 1602-8.
45. Doyle, D. A., Morais Cabral, J., Pfuetzner, R. A., Kuo, A., Gulbis, J. M., Cohen, S. L., Chait, B. T., MacKinnon, R., *The structure of the potassium channel: molecular basis of K⁺ conduction and selectivity*. Science (1998), **280**, 69-77.
46. Jiang, Y., Lee, A., Chen, J., Cadene, M., Chait, B. T., MacKinnon, R., *The open pore conformation of potassium channels*. Nature (2002), **417**, 523-6.
47. Jiang, Y., Lee, A., Chen, J., Cadene, M., Chait, B. T., MacKinnon, R., *Crystal structure and mechanism of a calcium-gated potassium channel*. Nature (2002), **417**, 515-22.
48. Schumacher, M., Adelman, J. P., *Ion channels: An open and shut case*. Nature (2002), **417**, 501-2.
49. Tsetlin V ,and Utkin Y unpublished results

50. Grabherr, R., Ernst, W., *The baculovirus expression system as a tool for generating diversity by viral surface display*. Comb Chem High Throughput Screen (2001), **4**, 185-92.
51. Wolff, M. W., Zhang, F., Roberg, J. J., Caldwell, E. E., Kaul, P. R., Serrahn, J. N., Murhammer, D. W., Linhardt, R. J., Weiler, J. M., *Expression of CI esterase inhibitor by the baculovirus expression vector system: preparation, purification, and characterization*. Protein Expr Purif (2001), **22**, 414-21.
52. Rao, U. S., Mehdi, A., Steimle, R. E., *Expression of amiloride-sensitive sodium channel: a strategy for the coexpression of multimeric membrane protein in Sf9 insect cells*. Anal Biochem (2000), **286**, 206-13.
53. Edwards, A. M., Arrowsmith, C. H., Christendat, D., Dharamsi, A., Friesen, J. D., Greenblatt, J. F., Vedadi, M., *Protein production: feeding the crystallographers and NMR spectroscopists*. Nat Struct Biol (2000), **7 Suppl**, 970-2.
54. Diplomarbeit Michael Schwake
55. Kuhn, S., Zipfel, P. F., *The baculovirus expression vector pBSV-8His directs secretion of histidine-tagged proteins*. Gene (1995), **162**, 225-9.
56. Zhu, Z., Bulgakov, O. V., Scott, S. S., Dalton, J. T., *Recombinant expression and purification of human androgen receptor in a baculovirus system*. Biochem Biophys Res Commun (2001), **284**, 828-35.
57. Tennagels, N., Hube-Magg, C., Wirth, A., Noelle, V., Klein, H. W., *Expression, purification, and characterization of the cytoplasmic domain of the human IGF-1 receptor using a baculovirus expression system*. Biochem Biophys Res Commun (1999), **260**, 724-8.
58. Sanghani, P. C., Moran, R. G., *Purification and characteristics of recombinant human folylpoly-gamma-glutamate synthetase expressed at high levels in insect cells*. Protein Expr Purif (2000), **18**, 36-45.
59. Schnurr, K., Borchert, A., Gerth, C., Anton, M., Kuhn, H., *Bacterial and non-bacterial expression of wild-type and mutant human phospholipid hydroperoxide glutathione peroxidase and purification of the mutant enzyme in the milligram scale*. Protein Expr Purif (2000), **19**, 403-10.
60. Moss, S. J., McDonald, B. J., Rudhard, Y., Schoepfer, R., *Phosphorylation of the predicted major intracellular domains of the rat and chick neuronal nicotinic acetylcholine receptor alpha 7 subunit by cAMP-dependent protein kinase*. Neuropharmacology (1996), **35**, 1023-8.
61. He, H. J., Yuan, Q. S., Yang, G. Z., Wu, X. F., *High-level expression of human extracellular superoxide dismutase in Escherichia coli and insect cells*. Protein Expr Purif (2002), **24**, 13-7.
62. Lamark, T., Ingebrigtsen, M., Bjornstad, C., Melkko, T., Mollnes, T. E., Nielsen, E. W., *Expression of active human CI inhibitor serpin domain in Escherichia coli*. Protein Expr Purif (2001), **22**, 349-58.
63. Sachdev, D., Chirgwin, J. M., *Solubility of proteins isolated from inclusion bodies is enhanced by fusion to maltose-binding protein or thioredoxin*. Protein Expr Purif (1998), **12**, 122-32.
64. Chirgwin, J. M., Schultz, S., Sachdev, D., *Expression of chimeric human aspartic proteinases*. Adv Exp Med Biol (1998), **436**, 139-46.
65. Nilsson, J., Stahl, S., Lundeberg, J., Uhlen, M., Nygren, P. A., *Affinity fusion strategies for detection, purification, and immobilization of recombinant proteins*. Protein Expr Purif (1997), **11**, 1-16.
66. Thomas, J. G., Ayling, A., Baneyx, F., *Molecular chaperones, folding catalysts, and the recovery of active recombinant proteins from E. coli. To fold or to refold*. Appl Biochem Biotechnol (1997), **66**, 197-238.

67. Machida, S., Ogawa, S., Xiaohua, S., Takaha, T., Fujii, K., Hayashi, K., *Cycloamylose as an efficient artificial chaperone for protein refolding*. FEBS Lett (2000), **486**, 131-5.
68. Zubay, G., *In vitro synthesis of protein in microbial systems*. Annu Rev Genet (1973), **7**, 267-87.
69. Martemyanov, K. A., Shirokov, V. A., Kurnasov, O. V., Gudkov, A. T., Spirin, A. S., *Cell-free production of biologically active polypeptides: application to the synthesis of antibacterial peptide cecropin*. Protein Expr Purif (2001), **21**, 456-61.
70. Cihlar, T., Fuller, M. D., Cherrington, J. M., *Expression of the catalytic subunit (UL54) and the accessory protein (UL44) of human cytomegalovirus DNA polymerase in a coupled in vitro transcription/translation system*. Protein Expr Purif (1997), **11**, 209-18.
71. Rungpragayphan, S., Kawarasaki, Y., Imaeda, T., Kohda, K., Nakano, H., Yamane, T., *High-throughput, Cloning-independent Protein Library Construction by Combining Single-molecule DNA Amplification with in Vitro Expression*. J Mol Biol (2002), **318**, 395-405.
72. Ma, L., Wang, X. N., Zhang, Z. Q., Zhou, X. M., Zeng, G. F., Chen, A. J., *Expression, Purification and Biological Activity Analysis of Human Vascular Endothelial Growth Factor (VEGF(165)) in Pichia pastoris*. Sheng Wu Hua Xue Yu Sheng Wu Wu Li Xue Bao (Shanghai) (2001), **33**, 325-30.
73. Murasugi, A., Tohma-Aiba, Y., *Comparison of three signals for secretory expression of recombinant human midkine in Pichia pastoris*. Biosci Biotechnol Biochem (2001), **65**, 2291-3.
74. Sarramegna, V., Demange, P., Milon, A., Talmont, F., *Optimizing functional versus total expression of the human mu-opioid receptor in Pichia pastoris*. Protein Expr Purif (2002), **24**, 212-20.
75. Wang, S. H., Yang, T. S., Lin, S. M., Tsai, M. S., Wu, S. C., Mao, S. J., *Expression, Characterization, and Purification of Recombinant Porcine Lactoferrin in Pichia pastoris*. Protein Expr Purif (2002), **25**, 41-49.
76. Xin, L., Zhang, L., Xu, R., Zhang, Q., Ye, Q., Li, Z. P., Gan, R. B., *Expression of Human Angiostatin in Pichia pastoris and the Detection of Its Anti-angiogenic Activity*. Sheng Wu Hua Xue Yu Sheng Wu Wu Li Xue Bao (Shanghai) (2001), **33**, 291-95.
77. Bradford, M. M., *A rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding*. Anal Biochem (1976), **72**, 248-54.
78. Smith, P. K., Krohn, R. I., Hermanson, G. T., Mallia, A. K., Gartner, F. H., Provenzano, M. D., Fujimoto, E. K., Goetze, N. M., Olson, B. J., Klenk, D. C., *Measurement of protein using bicinchoninic acid*. Anal Biochem (1985), **150**, 76-85.
79. Laemmli, U. K., *Cleavage of structural proteins during the assembly of the head of bacteriophage T4*. Nature (1970), **227**, 680-5.
80. Tzartos, S. J., Remoundos, M. S., *Precise epitope mapping of monoclonal antibodies to the cytoplasmic side of the acetylcholine receptor alpha subunit. Dissecting a potentially myasthenogenic epitope*. Eur J Biochem (1992), **207**, 915-22.
81. Sanger, F., Nicklen, S., Coulson, A. R., *DNA sequencing with chain-terminating inhibitors*. Proc Natl Acad Sci U S A (1977), **74**, 5463-7.

82. Vaughn, J. L., Goodwin, R. H., Tompkins, G. J., McCawley, P., *The establishment of two cell lines from the insect Spodoptera frugiperda (Lepidoptera; Noctuidae)*. In Vitro (1977), **13**, 213-7.
83. O'Reilly, D. R., Miller, L. K., Luckow, V. A., *Baculovirus expression vectors: a laboratory manual*, Freeman and Company, New York, **1992**.
84. Volman, L. E., Goldsmith, P. A., Appl Envir Microbiol (1982), **44**, 227-33.