

K. Ulrich (Ulli) Bayer

Department of Pharmacology

Program in Neuroscience

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BS/MS - Hamburg University (Dipl. Biol., 1987-1992)

Ph.D. - HPI (Dr. rer. nat., 1992-1996)

PostDoc - Stanford University (1996 - 2002)

Research Experience

- 2015-present Professor, Dept. of Pharmacology, University of Colorado Denver.
2010-2015 Associate Professor, Dept. of Pharmacology, University of Colorado Denver.
2003-2010 Assistant Professor, Dept. of Pharmacology, University of Colorado Denver.
2002-2003 Research Associate (with Tobias Meyer and Howard Schulman), Molecular Pharmacology and Neurobiology, Stanford University School of Medicine.
1996-2002 Postdoctoral Fellow (with Howard Schulman), Dept. of Neurobiology, Stanford University School of Medicine.
1991-1996 Graduate student and undergraduate trainee (with Klaus Harbers), Department for Molecular Pathology, Heinrich-Pette-Institut (HPI), Hamburg, Germany.
1990-1991 Undergraduate Lab-Technician (with Eckhardt Gundelfinger), Zentrum für Molekulare Neurobiologie, Hamburg (ZMNH), Germany.

Academic Service & Teaching

Grant review:

- National Institutes of Health (NIH), study section member, SYN (2017-21) and NC (2021-23)
- NIH, ad hoc reviewer, study sections ZRG1-EMNR-C 58, SYN, and LAM (2009; 2016; 2017)
- The Brain Foundation Netherlands (Hersenstichting), Netherlands (2023)
- The Marsden Fund of the Royal Society, New Zealand (2017)
- Netherlands Organization for Scientific Research (NW), Netherlands (2017)
- Israel Science Foundation (ISF), Israel (2015)
- Portugese Foundation for Science and Technology (FCT), Portugal (2012)
- The Wellcome Trust, UK (2005; 2010)
- National Foundation for Science (NZZ), Republic of Croatia (2010)
- American Heart Association, regular member on study section
“Basic Cell and Molecular Biology 1” (2004-2007)

Journal review (selected):

Nature, Nature Neurosci., Nature Comm. Nature SMB, Science Advances, Science Translational Medicine, Neuron, Cell Reports, eLife, EMBO J., PNAS, J. Neurosci., Scientific Reports, PLoS One, J. Neurochem., FEBS J., Mol. Cell. Neurosci., Mol. Pharmacol., Frontiers Pharmacol., Brain Res., Learning and Memory, Biophys. J., F1000Research.

Committees and Service:

Current: CU Innovations Liaison (since 2018), Crnic Institute, Human Trisomy Project Biobank, Sample Request Committee (since 2022), Pharmacology Promotions and Tenure Committee (since 2019).

Past: Faculty Senate (2010-2018), Post-Tenure Review (Chair, 2018+2019), Environmental Health and Safety (2005-2012), Machine Shop Core (Director, 2010-2016), Pharmacology Graduate Recruitment (2004-2017), Pharmacology Faculty Recruitment (2010-2017),

Neuroscience Steering (2004-2007; 2016-2023), Neuroscience membership (Chair, 2016-2023), Neuroscience Seminar (Chair, 2004-2006), Neuroscience Retreat (Chair, 2006), Molecular Biology Seminar (2011-2014),

Teaching:

Current: Grant Proposals (Pharm.; Director); Receptors and Cell Signaling (Pharm); Frontiers in Pharmacology (Pharm.); Neuroscience Bootcamp (Neuro.).

Past: Biological Basis of Psychiatric and Neurological Disorders (Neuro.); From Molecules to Medicine (Med.).

Honors and awards:

Pharmacology Excellence in Teaching Award (2016, 2022); Dean's Excellence in Mentoring Award (2015); Pharmacology Excellence in Research Award (2013, 2023); Pharmacology "dream team" Research Award (2022); SOM Research Collaboration Award (2022).

PostDoc invited speaker at NIH (2011); Student invited speaker at the "Section Days" of the DFG Excellence Center in Bochum (2008).

Gordon Research Conferences, Chairs Fund Award (2000, 01, 02, 07, 08, 11, 12, 17, 18, 24).

Stanford University Fellowship (1998-2002); Research fellowship of the DFG (German Research Association)(1996-1998); Ph.D. fellowship of the HPI (1992-1996)

Selected Lectures

lectures at conferences:

- 2024 - Gordon Research Conference: Synaptic Transmission; Il Ciocco, Italy (July 17)
 - Park City Winter Conference on the Neurobiology of Learning and Memory; UT (Jan 5)
- 2023 - Winter Conference on Brain Research; Snowbird, UT; session chair (Jan. 23)
- 2020 - Winter Conference on Brain Research; Big Sky, MT; session chair (Jan. 30)
- 2019 - Banbury Center Meeting: CaMKII and its role as a self-tuning structural protein at the synapse; Cold Spring Harbor Laboratories, NY (Oct 29)
- 2018 - Gordon Research Conference: Synaptic Transmission; Waterville Valley, NH (Aug)
- 2017 - FASEB summer conference: Ion Channel Regulation; Steamboat, CO (July 11)
 - Gordon Research Conference: Excitatory Synapses & Brain Function; Les Diablerets, Switzerland (May 30)
 - Winter Conference on Brain Research; Big Sky, MT (Jan. 30)
- 2016 - Winter Conference on Brain Research; Breckenridge, CO (Jan. 25)
- 2015 - A Day of Biochemistry; Broad Institute at Harvard/MIT, MA (June 04)
 - Winter Conference on Brain Research; Big Sky, MT; session chair (Jan. 25)
- 2014 - Winter Conference on Brain Research; Steamboat, CO; session chair (Jan.27)
- 2013 - Winter Conference on Brain Research; Breckenridge, CO; session chair (Jan. 29)
- 2011 - Gordon Research Conference: Excitatory Synapses & Brain Function; MA (June)
 - Winter Conference on Brain Research; Keystone, CO; session chair (Jan. 26)
- 2010 - Winter Conference on Neural Plasticity; Aruba (Feb. 07) (5 min short talk)
- 2009 - Colorado Science Conference; Denver, CO (Nov. 20)
- 2008 - Gordon Research Conference: Cell Biology of the Neuron; NH. (June 18).
- 2007 - Gordon Research Conference: Excitatory Synapses & Brain Function; NH (June)
 - Winter Conference on Brain Research, Snowmass, CO (Jan)

lectures at other academic institutions:

- 2022 - Center for Molecular Neuroscience, Hamburg, Germany; Institute Seminar (June 21)
- 2019 - Northwestern University, Chicago, IL; Physiology Seminar (Oct 04)
 - Colorado State University, Fort Collins, CO; Neuroscience Seminar (Oct 09)
- 2017 - Metro State University, Denver, CO; Psychology Lecture (Apr 10)

- 2015 - University of Washington, WA; Seattle Children's Research Institute (May 08)
- 2014 - Broad Institute at Harvard/MIT, Cambridge, MA; Stanley Center Seminar (May 15)
- 2013 - University of Texas, El Paso; Biology Seminar (Mar. 8)
- 2012 - Ruhr University Bochum; Neuroscience Program Seminar (July 3)
- University of Washington, Seattle, WA; Physiology & Biophysics Seminar (May. 3)
- 2011 - NIH/NINDS, Bethesda, MD; PostDoc invited seminar (Sept. 14)
- 2010 - Regis University, Denver, CO; Neuroscience Seminar (Feb. 18)
- 2009 - University of Naples Frederico II, Italy; Interdepartmental Seminar (Sept. 15)
- University of Wyoming, Laramie; Neuroscience Seminar (Apr 2)
- 2008 - Ruhr University Bochum; Excellence Center Section Days; Student invited (Nov 5)
- Center for Molecular Neurobiology (ZMNH), Hamburg University;
Institute Seminar (Sept 11)
- Denver University; Biological Sciences Seminar (Apr 14)
- 2007 - Universite Laval, Quebec, Canada; Neuroscience Seminar (June)
- 2006 - Charite at Humboldt University, Berlin; Neuroscience Seminar (July 7)
- 2005 - HPI at Hamburg University, Germany; Institute Seminar (Mar)
- MRC-Laboratory for Molecular Biology (LMB), Cambridge;
Neurobiology Seminar (Mar 21).

Research Support

active:

NIH R01 NS081248 (PI: Bayer; 20% effort) \$5,092,097 07/01/2013 – 03/31/2028
“CaMKII holoenzyme mechanisms in opposing directions of synaptic plasticity” will investigate the functions of newly discovered mechanisms of CaMKII substrate site selection in promotion of LTD versus LTP. This grant has been competitively renewed in 2017 and in 2023, and received a major supplement in 2018.

NIH R01 AG067713 (PI: Bayer; 25% effort) \$2,447,725 08/01/2020 – 07/31/2025
“CaMKII nitrosylation in the age-related decline of synaptic plasticity” will investigate the mechanism and roles of CaMKII misregulation related to the cognitive decline during aging.

NIH R01 NS118786 (MPIs: Bayer/Herson; 12.5%) \$1,943,750 01/15/2021 – 11/30/2025
“CaMKII in global cerebral ischemia: mechanisms and therapeutic intervention” will explore underlying disease mechanism and the possibility for extended therapeutic time windows.

selected completed funding:

NIH R01 NS110383 (MPIs: Bayer/Dell'Acqua/Kennedy; 15% effort)
 \$2,815,825 09/30/2018 – 06/30/2023
“Postsynaptic kinase/phosphatase networks in amyloid beta-induced synaptic dysfunction” investigated the signaling mechanisms underlying synaptic pathology related to Alzheimer's.

NIH R43 NS120427 (PI: Goforth) \$ 496,145 09/24/2021 – 08/31/2022
“Preparing for IND-enabling safety studies for a potent and efficient neuroprotective drug”.
 Role: wrote the grant and leading a University subcontract project for \$79,595 of this phase I SBIR grant for Neurexix Therapeutics; a phase II submission is planned.

NIH R01 NS080851 (co-PIs: Bayer/Herson; 25%) \$2,067,267 05/01/2013 – 04/30/2018
“CaMKII in global cerebral ischemia” will utilize our novel CaMKII inhibitor and three CaMKII mutant mouse lines in order to discover mechanisms of neuronal cell death and validate specific therapeutic drug targets.

NIH U01 NS094261 (PI: Bayer; 20% effort) \$ 776,926 03/01/2017 - 11/30/2018
“A strategy for pharmacological treatment of global cerebral ischemia” will develop a CaMKII inhibitor towards a therapy for patients.

NIH R01 NS052644 (PI: Bayer; 40% effort) \$1,632,227 01/31/2007 - 11/30/2012
“Structural and catalytic CaMKII functions in neurons”

Past and present student and postdoc fellowships:

Matthew Larsen – NIH F31 AG084197 08/01/23-07/31/26

“APP as a mediator of amyloid beta effects on CaMKII synaptic functions”

Carolyn Nicole Brown – NIH F31 NS129254 08/01/22-07/31/25

“Molecular computation by the CaMKII holoenzyme”

Nicole Rumian – NIH F31 AG069458 03/05/21-02/28/23

“CaMKII hypo-nitrosylation in age-related decline of synaptic plasticity and cognition”

Olivia Buonarati – NIH F32 AG066536 05/01/20-04/30/23

“APP signaling impairs CaMKII-dependent synaptic plasticity after ischemic brain injury”

Sarah Cook – NIH F31 AG062160 05/01/19-04/30/21

“Suppression of CaMKII synaptic targeting and beta-amyloid pathology”

Dayton Goodell – NIH F31 NS092265 03/01/15-02/28/18

“DAPK1 regulation and involvement in LTD”

Kelsey Barcomb – NIH F31 NS083298 12/01/13-05/31/15

“Mechanisms of CaMKII binding to GluN2B and its role in synaptic plasticity and memory”

Isabelle Buard – Thorkildsen Fellowship 04/01/09-03/31/10

“CaMKII inhibition in stroke and epilepsy”

Rebekah Vest – NIH F31 NS061584 03/01/08-07/31/11

“CaMKII in neuronal excitotoxicity”

Publications (*: as corresponding author, even when not listed last)

- Original research articles in peer reviewed journals:

1. Hamann, L., Bayer, K.-U., Jensen, K. and Harbers, K. (1994) Interaction of several related GC-box- and GT-box-binding proteins with the intronic enhancer is required for differential expression of the gb110 gene in embryonal carcinoma cells. *Mol. Cell. Biol.*, 14:5786-5793.
2. Bayer, K.-U., Löhler, J. and Harbers, K. (1996) An alternative, nonkinase product of the brain-specifically expressed Ca²⁺/calmodulin-dependent kinase II α isoform gene in skeletal muscle. *Mol. Cell. Biol.*, 16:29-36.
3. Bayer, K.-U., Harbers, K. and Schulman, H. (1998) α KAP is an anchoring protein for a novel CaM kinase II isoform in skeletal muscle. *EMBO J.*, 17:5598-5605.
4. * Bayer, K.-U., Löhler, J., Schulman, H. and Harbers, K. (1999) Developmental expression of the CaM kinase II isoforms: ubiquitous γ - and δ -CaM kinase II are the early isoforms and most abundant in the developing nervous system. *Mol. Brain Res.*, 70: 147-154.
5. * Bayer, K.-U., De Koninck, P., Leonard, A.S., Hell, J.W. and Schulman, H. (2001) Interaction with the NMDA receptor locks CaMKII in an active conformation. *Nature*, 411:801-805.
6. Leonard, A. S., Bayer, K. U., Merrill, M., Shea, M. A., Schulman, H. and Hell, J.W. (2002) Regulation of CaMKII docking to NMDA receptors by calcium/calmodulin and α -actinin. *J. Biol. Chem.*, 277:48441-48448.
7. * Bayer, K. U., De Koninck, P. and Schulman, H. (2002) Alternative splicing modulates the frequency-dependent response of CaMKII to Ca²⁺-oscillations. *EMBO J.*, 21:3590-3597.

8. Illario, M., Cavallo, A. L., **Bayer, K. U.**, Di Matola, Fenzi, G. Rossi, G., and Vitale, M. (2003) Calcium/calmodulin-dependent protein kinase II binds to Raf-1 and modulates integrin-stimulated Erk activation. *J. Biol. Chem.*, 278:45101-45108.
9. * Nori, A., Lin, P. J., Galassi, L., Visentini, F., Casseti, A., Villa, A., **Bayer, K. U.** and Volpe, P. (2003) Targeting of α KAP to sarcoplasmic reticulum and nuclei of skeletal muscle. *Biochem. J.*, 370:873-880.
10. Fink, C., **Bayer, K. U.**, Myers, J. W., Ferrell, J. E. Schulman, H. and Meyer, T. (2003) Selective regulation of neurite extension, movement and branching by the β but not the α isoform of CaMKII. *Neuron*, 39:283-297.
11. * O'Leary, H., Sui, X., Lin, P.-J., Volpe, P., and **Bayer, K. U.** (2006) Nuclear targeting of the CaMKII anchoring protein α KAP is regulated by alternative splicing and protein kinases. *Brain Res.* 1086:17-26.
12. * **Bayer, K. U.**, LeBel, E., McDonald, G.L., O'Leary, H., Schulman, H. and DeKoninck, P. (2006) Transition from reversible to persistent binding of CaMKII to postsynaptic sites and NR2B. *J. Neurosci.* 26:1164-1174. (*featured article*).
13. * O'Leary, H., Lasda, E. and **Bayer, K. U.** (2006) CaMKII β association with the actin cytoskeleton is regulated by alternative splicing. *Mol. Biol. Cell*, 17:4646-4665.
14. Rokhlin, O. W., Taghiyev, A. F., **Bayer, K. U.**, Bumcrot, D., Koteliansk, V. E., Glover, R. A. and Cohen, M. B. (2007) Calcium/Calmodulin-dependent Kinase II plays an important role in prostate cancer cell survival. *Cancer Biol. Ther.* 6:732-742.
15. * Vest, R. S., Davies, K. D., O'Leary, H., Port, D. J. and **Bayer, K. U.** (2007) Dual mechanism of a natural CaMKII inhibitor. *Mol. Biol. Cell*, 18:5024-5033.
16. * Vest, R. S., O'Leary, H., and **Bayer, K. U.** (2009) Differential regulation by ATP versus ADP further links CaMKII aggregation to ischemic conditions. *FEBS Lett.*, 582:3577-3581 (*cover article*)
17. Cipolletta, E., Monaco, S., Maione, S. A., Vitiello, L., Campiglia, P., Pastore, L., Franchini, G., Novellina, E., **Bayer, K. U.**, Means, A. R., Rossi, G., Trimarco, B., Iaccarino, G., and Illario, M. (2010) CaMKII mediates vascular smooth muscle cell proliferation and is potentiated by Erk. *Endocrinology* 151:2747-2759.
18. Marsden, K. C., Semesh, A., **Bayer, K. U.**, and Carroll, R. C. (2010) Selective translocation of CaMKII α to inhibitory synapses. *Proc. Natl. Acad. Sci.* 107:20559-20564
19. * Coultrap, S. J., Buard, I., Kulbe, J. P., Dell'Acqua, M. L., and **Bayer, K. U.** (2010) CaMKII autonomy is substrate-dependent and further stimulated by Ca²⁺/Calmodulin. *J. Biol. Chem.* 285:17930-17937
20. * Vest, R. S., O'Leary, H., Coultrap, S. J., Kindy, M. and **Bayer, K. U.** (2010) Effective post-insult neuroprotection by a novel CaMKII inhibitor. *J. Biol. Chem.* 285:20675-20682.
21. * Buard, I., Freund, R., Lee, Y.-S., Coultrap, S. J., Dell'Acqua, M. L., Silva, A. J., and **Bayer, K. U.** (2010) CaMKII "autonomy" is required for initiating but not for maintaining neuronal long-term information storage. *J. Neurosci.* 30:8214-8220.
22. * Coultrap, S. J., and Bayer, K. U. (2011) Improving a natural CaMKII inhibitor by random and rational design. *PLoS ONE* 6(10): e25245.
23. * Sanhueza, M., Fernandez-Villalobos, G., Stein, I. S., Kasumova, G., Zhang, P., **Bayer, K. U.**, Otmakhov, N., Hell, J. W., and Lisman, J. (2011) Role of the CaMKII/NMDA receptor complex in the maintenance of synaptic strength. *J. Neurosci.* 31:9170-9178.
24. * O'Leary, H., Liu, W. H., Rorabaugh, J., Coultrap, S. J. and **Bayer, K. U.** (2011) Nucleotides and phosphorylation bi-directionally modulate CaMKII binding to the NMDA-receptor subunit GluN2B. *J. Biol. Chem.* 286:31272-81282.
25. * Coultrap, S. J., Barcomb, K. and **Bayer, K. U.** (2012) A significant but rather mild contribution of T286 autophosphorylation to Ca²⁺/CaM-stimulated CaMKII activity. *PLoS ONE* 7(5): e37176.
26. Boguslavsky, S., Bilan, P., **Bayer, K. U.**, and Klip, A. (2012) Myo1c binding to sub-membrane actin mediates insulin-induced tethering of GLUT4 vesicles. *Mol. Biol. Cell.* 23:4065-4078.

27. * Loweth, J. A., Li, D., Cortright, J. J., Wilke, G., Jeyifous, O., Neve, R.L., **Bayer, K. U.**, Vezina P. (2013) Persistent reversal of enhanced amphetamine intake by transient CaMKII inhibition. *J. Neurosci.* 33:1411-1416.
28. Yang, Y., Tao-Chen, J.-H., **Bayer, K. U.**, Reese, T. S., and Dosemeci, A. (2013) CaMKII-mediated phosphorylation regulates distribution of SynGAP- α 1 and α 2 at the postsynaptic density. *PLoS ONE* 8(8): e71795.
29. Tao-Cheng, J.-H., Yang, Y., **Bayer, K. U.**, Reese, T. S., and Dosemeci, A. (2013) Effects of the CaMKII inhibitor tatCN21 on activity-dependent redistribution of CaMKII in hippocampal neurons. *Neurosci.* 244:188-196.
30. * Barcomb, K., Coultrap, S. J., and **Bayer, K. U.** (2013) Enzymatic activity of CaMKII is not required for its interaction with the glutamate receptor subunit GluN2B. *Mol. Pharmacol.* 84:834-843.
31. Thein, S., Tao-Cheng, J.-H., Li, Y, **Bayer, K. U.**, Reese, T. S., and Dosemeci, A. (2014) CaMKII mediates recruitment and activation of the deubiquitinase CYLD at the postsynaptic density *PLoS ONE* 9(3):e91312.
32. * Kulbe, J. R., Mulcahy Levy, J. M., Coultrap, S. J., Thorburn, A., and **Bayer, K. U.** (2014) Excitotoxic glutamate insults block autophagic flux in neurons. *Brain Res.* 1542:12-19.
33. Thein, S., Pham, A., **Bayer, K. U.**, Tao-Cheng, J.-H., and Dosemeci, A. (2014) IKK Regulates the Deubiquitinase CYLD at the Postsynaptic Density. *Biochem. Biophys. Res. Comm.* 450:550-554.
34. * Goodell, D., Eliseeva, T. A, Coultrap, S. J., and **Bayer, K. U.** (2014) CaMKII binding to GluN2B is differentially affected by molecular crowding reagents. *PLoS ONE* 9(5):e96522
35. Tao-Cheng, J.-H., Yang, Y., **Bayer, K. U.**, Reese, T. S., and Dosemeci, A. (2014) CaMKII mediates NMDA-induced accumulation of Shank at the postsynaptic density. *Biochem. Biophys. Res. Comm.* 450:808-811.
36. Bernard, P. B., Castano, A. M., **Bayer, K. U.**, and Benke, T.A. (2014) Insights into the Mechanisms of mGluR Mediated Long Term Depression from the Rat Model of Early Life Seizures. *Neuropharmacology* 84:1-12.
37. Liu, X., Liu, Y., Zhong, P., Wilkinson, B., **Bayer, K. U.**, Qi, J., and Liu, Q. S. (2014) CaMKII activity in the ventral tegmental area gates cocaine-induced synaptic plasticity in the nucleus accumbens. *Neuropsychopharmacol.* 39:989-999.
38. * Barcomb, K., Buard, I., Coultrap, S. J., Kulbe, J. R., O'Leary, H., Benke, T.A., and **Bayer, K. U.** (2014) Autonomous CaMKII requires further stimulation by Ca²⁺/calmodulin for enhancing synaptic strength. *FASEB J.* 28:3810-3819.
39. * Coultrap, S. J., and **Bayer, K. U.** (2014) Nitric oxide induces Ca²⁺-independent activity of the Ca²⁺/calmodulin-dependent protein kinase II (CaMKII). *J. Biol. Chem.* 289:19458-19465.
40. Turecek, J., Yuen, G., Han, V. Z., Zeng, X.-H., **Bayer, K. U.**, and Welsh, J. P. (2014) Potentiation of weak electrical coupling by NMDA receptor activation in the mammalian brain. *Neuron* 81(6):1375-88.
41. * Coultrap, S. J., and **Bayer, K. U.** (2014) CaMKII isoforms differ in their specific requirements for regulation by nitric oxide. *FEBS Lett.*, 588:4672-4676
42. * Coultrap, S. J., Freund, R., O'Leary, H., Sanderson, J., Roche, K., Dell'Acqua, M.L., and **Bayer, K. U.** (2014) Autonomous CaMKII mediates both LTP and LTD using a mechanism for differential substrate site selection. *Cell Reports* 6:431-437.
43. * Barcomb, K., Goodell, D. J., Arnold, D. B., and **Bayer, K. U.** (2015) Live imaging of endogenous Ca²⁺/calmodulin-dependent protein kinase II in neurons reveals that ischemia-related aggregation does not require kinase activity. *J. Neurochem.* 125:666-673.
44. Dosemeci, A., Toy, D., Burch, A., **Bayer, K. U.**, and Tao-Cheng, J. H. (2016) CaMKII-mediated displacement of AIDA-1 out of the postsynaptic density core. *FEBS Lett* 590:2924-2939.
45. Khan, S., Conte, I., Carter, T., **Bayer, K. U.**, and Molloy, J. E. (2016) Multiple CaMKII Binding Modes to Cytoskeletal Actin revealed by Single Molecule Imaging. *Biophys J.* 111:395-408.

46. * Goodell, D. J., Benke, T. A., and **Bayer, K. U.** (2016) Developmental restoration of hippocampal LTP deficits in heterozygous CaMKII α ko mice. *J. Neurophysiol.* 116:2140-2151.
47. * Barcomb, K., Hell, J. W. Benke, T. A., and **Bayer, K. U.** (2016) The CaMKII/GluN2B protein interaction maintains synaptic strength. *J. Biol. Chem.* 291:16082-16089.
48. Yang, W., Han, V. Z., Zhu, Z., **Bayer, K. U.**, and Welsh, J. P. (2017) NMDA receptor modulation of the mouse inferior olive examined by the optical probing of electrical coupling. *Dev. Neurobiol.* submitted
49. * Deng, G., Orfila, J. E., Dietz, R. M., Moreno-Garcia, M., Coultrap, S. J., Quillinan, N., Traystman, R. J., **Bayer, K. U.**, and Herson, P. S. (2017) Autonomous CaMKII activity as a drug target for histological and functional neuroprotection after resuscitation from cardiac arrest. *Cell Reports* 18:1109-1117.
50. * Myers, J., Zaegel, V., Coultrap, S. J., Miller, A., **Bayer, K. U.**, and Reichow, S. L. (2017) The CaMKII holoenzyme structure in activation-competent conformations. *Nature Commun.* 8:15742.
51. * Goodell, D. J., Zaegel, V., Coultrap, S. J., and **Bayer, K. U.** (2017) DAPK1 mediates LTD by making the CaMKII/GluN2B binding LTP-specific. *Cell Reports* 19:2231-2243.
52. * Cook, S. G., Bourke, A. M, O'Leary, H., Zaegel, V., Lasda, E., Mize-Berge, J., Quillinan, N., Tucker, C. L., Coultrap, S. J., Herson, P. S. and **Bayer, K. U.** (2018) Analysis of the CaMKII α and β splice-variant distribution among brain regions reveals isoform-specific differences in holoenzyme formation. *Sci. Rep.* 8:5448.
53. Opazo, P., da Silva, S. V., Carta, M., Breillat, C., Coultrap, S. J., Grillo-Bosch, D., Sainlos, M., Coussen, F., **Bayer, K. U.**, Mulle, C., and Choquet, D. (2018) CaMKII metaplasticity drives A β oligomers-mediated synaptotoxicity. *Cell Reports* 23:3137-3145.
54. * Cook, S. G., Goodell, D. J., Restrepo, S., Arnold, D. B., and **Bayer, K. U.** (2019) Simultaneous live-imaging of three endogenous proteins reveals that β amyloid blocks the LTP-induced synaptic accumulation of CaMKII. *Cell Reports*. 27: 658-665. (cover article)
55. Chalmers, N., Yoncheck, J., Steklac, K., Ramsey, M., **Bayer, K. U.**, Herson, P. S., and Quillinan, N. (2020) Calcium/calmodulin-dependent kinase (CaMKII) inhibition protects against purkinje cell damage following CA/CPR in mice. *Mol. Neurobiol.* 57:150-158
56. * Tullis, J. E., Rumian, N. L., Brown, C. N., and **Bayer, K. U.** (2020) The CaMKII K42M and K42R mutations are equivalent in suppressing kinase activity and targeting. *PLOS One* 15: e0236478. (featured article)
57. * Buonarati, O. R., Cook, S. G., Goodell, D. J., Chalmers, N. E., Rumian, N. L. Tullis., J. E., Restrepo, S, Coultrap, S. J., Quillinan, N., Herson, P. S., and **Bayer, K. U.** (2020) CaMKII versus DAPK1 binding to GluN2B in ischemic neuronal cell death after resuscitation from cardiac arrest. *Cell Reports*. 30: 1-8.
58. * Goodell, D. J., Tullis, J. E., and **Bayer, K. U.** (2021) Young DAPK1 knockout mice have altered pre-synaptic function. *J. Neurophysiol.* 125: 1973-1981 (cover article for July-Sept)
59. * Rumian, N. L., Chalmers, N. E., Tullis, J. E., Herson, P. S., and **Bayer, K. U.** (2021) CaMKII α knockout protects from ischemic neuronal cell death after resuscitation from cardiac arrest. *Brain Research* 1773: 147699.
60. * Tullis, J. E., Buonarati, O. R., Coultrap, S. J., Bourke, A. M., Tiemeier, E. L., Kennedy, M. J., Herson, P. S., and **Bayer, K. U.** (2021) GluN2B S1303 phosphorylation by CaMKII or DAPK1: no indication for involvement in ischemia or LTP. *iScience* 24:103214
61. * Brown, C. B., Cook, S. G., Allen, H. F., Crosby, K. C., Singh, T., Coultrap, S. J., and **Bayer, K. U.** (2021) Characterization of six CaMKII α variants found in patients with schizophrenia. *iScience* 24:103184
62. * Cook, S. G., Buonarati, O. R., Coultrap, S. J., and **Bayer, K. U.** (2021) CaMKII holoenzyme mechanisms that govern the LTP versus LTD decision. *Science Advances*. 7: eabe2300

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