CURRICULUM VITAE **(**Updated May 2018)

Name: AMY ARAI Office Telephone: (217) 545-0228
Southern Illinois University
School of Medicine Date of Birth: May 29, 1959
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Education

B.S. (Biology & Chemistry), 1982, Chiba University, Chiba, JAPAN
M.S. (Pharmacology), 1984, Chiba University, Chiba, JAPAN
Ph.D. (Pharmacology), 1987, Chiba University, Chiba, JAPAN

Societies:

American Society for Pharmacology and Experimental Therapeutics (1999-present)
Society for Neuroscience (1988-2016)

Experience:

Southern Illinois University School of Medicine, Springfield, Illinois
Medical Sophomore Curriculum Director – 2015- present
Professor of Pharmacology- 2012-Present
Associate Professor of Pharmacology- 2005-2011
Assistant Professor of Pharmacology- 1999- 2004
Aichi Medical School, Nagoya, JAPAN
Visiting Professor - 2018-present
University of California at Irvine, Irvine, California
Research Associate Professor 1997- 1999
Research Assistant Professor 1989 – 1996
Postdoctoral Fellow 1987-1989
Sandoz Pharmaceutical Inc (present Novartis)
Scientist 1987

Teaching Experience:

SUSM: Medical Education, Year 2 Curriculum Director (2015-present)
SIUSM: Medical Pharmacology, 1999-present
SIUSM: Medical Sophomore Medical Science, Neuromuscular and Behavior Unit Director (2004-2007, 2010-2014)
SIUSM: Medical Senior Neuropsychopharmacology Electives (2010- present)
SIUSM: Graduate Neuroscience, 1999- present
SIUSM: Graduate Pharmacology 550A, 551B, 574, 530, 500, 501
SIUSM: Medical Senior Pathophysiology and Pharmacology, 2016- present
SIUSM: Graduate Program Director (2008-2011)
SIUSM: Graduate Course Director PHRM 574 Neuropharmacology, PHRM 577 Neuroscience

Manuscript Review:

Brain Research, Experimental Neurology, J. Neuroscience, J. Neurophysiology, J. Pharmacology and Experimental Therapeutics, Br. J. Pharmacology, Neuropharmacology, Neuroscience Letters, Proceedings of the National Academy of Science

Grant Review:

National Institutes of Health, American Heart Association, SIU Research Grant Committee

Committees:

SIUSM Committee memberships:

Education Policy Committee, Grant Review Committee, Year 2 Curriculum Advisory Committee, Student Progress Committee, Year 2 Curriculum Student Progress Committee (all four organ units), Promotion & Tenure Committee, Grievance Committee, Dean's Professional Development Group

SIUSM Committee Ex-officio memberships:
Medical Curriculum Committee Y1-Y4

Chairmanships and Directorships: 1
Year 2 Medical Curriculum Director

Research Mentor: MS (1) PhD (2) Post doctoral (8)

GRANTS & CONTRACTS Received:
National Institute of Health, American Heart Association, Whitehall Foundation, Illinois Department of Public Health, Cortex Pharmaceuticals, Allergan Pharmaceuticals, AxzoNobel Organon Pharmaceuticals, Panasonic, Illinois Department of Public Health

PUBLICATIONS: 66- peer reviewed publications

1. A novel mechanism for the facilitation of theta-induced long-term potentiation by brain-derived neurotrophic factor.
   Kramár EA, Lin B, Lin CY, Arai AC, Gall CM, Lynch G.
   J Neurosci. 2004 Jun 2;24(22):5151-61.
   PMID: 15175384

2. Integrins regulate NMDA receptor-mediated synaptic currents.
   Lin B, Arai AC, Lynch G, Gall CM.
   J Neurophysiol. 2003 May;89(5):2874-8.
   PMID: 12740418

3. Benzamide-type AMPA receptor modulators form two subfamilies with distinct modes of action.
   Arai AC, Xia YF, Rogers G, Lynch G, Kessler M.
   J Pharmacol Exp Ther. 2002 Dec;303(3):1075-85.
   PMID: 12438530

4. Interactions between recording technique and AMPA receptor modulators.
   Lin B, Colgin LL, Brücher FA, Arai AC, Lynch G.
   Brain Res. 2002 Nov 15;955(1-2):164-73.
   PMID: 12419533

5. Effects of 5'-alkyl-benzothiadiazides on (R,S)-alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor biophysics and synaptic responses.
   Arai AC, Xia YF, Kessler M, Phillips D, Chamberlin R, Granger R, Lynch G.
   Mol Pharmacol. 2002 Sep;62(3):566-77.
   PMID: 12181433

6. 5'-alkyl-benzothiadiazides: a new subgroup of AMPA receptor modulators with improved affinity.
   Phillips D, Sonnenberg J, Arai AC, Vaswani R, Krutzik PO, Kleisli T, Kessler M, Granger R, Lynch G, Richard Chamberlin A.
   Bioorg Med Chem. 2002 May;10(5):1229-48.
   PMID: 11886787

7. Effects of the potent ampakine CX614 on hippocampal and recombinant AMPA receptors: interactions with cyclothiazide and GYKI 52466.
   Arai AC, Kessler M, Rogers G, Lynch G.
   Mol Pharmacol. 2000 Oct;58(4):802-13.
   PMID: 10999951

8. Positive modulation of AMPA receptors increases neurotrophin expression by hippocampal and cortical neurons.
Lauterborn JC, Lynch G, Vanderklish P, Arai A, Gall CM.
J Neurosci. 2000 Jan 1;20(1):8-21.
PMID: 10627576

9. Synergistic interactions between ampakines and antipsychotic drugs.
Johnson SA, Luu NT, Herbst TA, Knapp R, Lutz D, Arai A, Rogers GA, Lynch G.
J Pharmacol Exp Ther. 1999 Apr;289(1):392-7.
PMID: 10087029

10. AMPA receptor desensitization modulates synaptic responses induced by repetitive afferent stimulation in hippocampal slices.
Arai A, Lynch G.
Brain Res. 1998 Jul 20;799(2):235-42.
PMID: 9675296

11. The waveform of synaptic transmission at hippocampal synapses is not determined by AMPA receptor desensitization.
Arai A, Lynch G.
Brain Res. 1998 Jul 20;799(2):230-4.
PMID: 9675293

12. A profile of the behavioral changes produced by facilitation of AMPA-type glutamate receptors.
Davis CM, Moskovitz B, Nguyen MA, Tran BB, Arai A, Lynch G, Granger R.
Psychopharmacology (Berl). 1997 Sep;133(2):161-7.
PMID: 9342782

13. Stable expression of recombinant AMPA receptor subunits: binding affinities and effects of allosteric modulators.
Hennegriff M, Arai A, Kessler M, Vanderklish P, Mutneja MS, Rogers G, Neve RL, Lynch G.
J Neurochem. 1997 Jun;68(6):2424-34.
PMID: 9166736

14. Effects of a centrally active benzoylpyrrolidine drug on AMPA receptor kinetics.
Arai A, Kessler M, Ambros-Ingerson J, Quan A, Yigiter E, Rogers G, Lynch G.
Neuroscience. 1996 Nov;75(2):573-85.
PMID: 8931020

15. Effect of the AMPA receptor modulator IDRA 21 on LTP in hippocampal slices.
Arai A, Guidotti A, Costa E, Lynch G.
Neuroreport. 1996 Sep 2;7(13):2211-5.
PMID: 8930991

16. Effects of a memory-enhancing drug on DL-alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptor currents and synaptic transmission in hippocampus.
Arai A, Kessler M, Rogers G, Lynch G.
J Pharmacol Exp Ther. 1996 Aug;278(2):627-38.
PMID: 8768713

17. Response to repetitive stimulation of AMPA receptors in patches excised from fields CA1 and CA3 of the hippocampus.
Arai A, Lynch G.
Brain Res. 1996 Apr 15;716(1-2):202-6.
PMID: 8738240

18. Effect of cyclothiazide on binding properties of AMPA-type glutamate receptors: lack of competition between cyclothiazide and GYKI 52466.
Kessler M, Arai A, Quan A, Lynch G.

Mol Pharmacol. 1996 Jan;49(1):123-31.
PMID: 8569697

19. Differences in the refractory properties of two distinct inhibitory circuitries in field CA1 of the hippocampus.
Arai A, Silberg J, Lynch G.
Brain Res. 1995 Dec 18;704(2):298-306.
PMID: 8788926

20. Proteolysis of spectrin by calpain accompanies theta-burst stimulation in cultured hippocampal slices.
Vanderklish P, Saido TC, Gall C, Arai A, Lynch G.
Brain Res Mol Brain Res. 1995 Aug;32(1):25-35.
PMID: 7494460

21. Effect of thiocyanate on AMPA receptor mediated responses in excised patches and hippocampal slices.
Arai A, Silberg J, Kessler M, Lynch G.
Neuroscience. 1995 Jun;66(4):815-27.
PMID: 7544449

22. A centrally active drug that modulates AMPA receptor gated currents.
Arai A, Kessler M, Xiao P, Ambros-Ingerson J, Rogers G, Lynch G.
Brain Res. 1994 Feb 28;638(1-2):343-6.
PMID: 7911064

23. Stimulation of NMDA receptors activates calpain in cultured hippocampal slices.
del Cerro S, Arai A, Kessler M, Bahr BA, Vanderklish P, Rivera S, Lynch G.
Neurosci Lett. 1994 Feb 14;167(1-2):149-52.
PMID: 8177514

24. Origins of the variations in long-term potentiation between synapses in the basal versus apical dendrites of hippocampal neurons.
Arai A, Black J, Lynch G.
Hippocampus. 1994 Feb;4(1):1-9.
PMID: 8061748

25. Factors regulating the magnitude of long-term potentiation induced by theta pattern stimulation.
Arai A, Lynch G.
Brain Res. 1992 Dec 11;598(1-2):173-84.
PMID: 1486479

26. Translational suppression of a glutamate receptor subunit impairs long-term potentiation.
Vanderklish P, Neve R, Bahr BA, Arai A, Hennegriff M, Larson J, Lynch G.
Synapse. 1992 Dec;12(4):333-7. No available.
PMID: 1465743

27. Antagonists of the Platelet-activating Factor Receptor Block Long-term Potentiation in Hippocampal Slices.
Arai A, Lynch G.
Eur J Neurosci. 1992;4(5):411-419.
PMID: 12106349

28. Factors governing the potentiation of NMDA receptor-mediated responses in hippocampus.
Muller D, Arai A, Lynch G.
Hippocampus. 1992 Jan;2(1):29-38.
PMID: 1364046

29. Failure to detect changes in AMPA receptor binding after long-term potentiation.
Kessler M, Arai A, Vanderklish P, Lynch G.

Brain Res. 1991 Sep 27;560(1-2):337-41.
PMID: 1684732

30. Inhibition of proteolysis protects hippocampal neurons from ischemia.
Lee KS, Frank S, Vanderklish P, Arai A, Lynch G.
Proc Natl Acad Sci U S A. 1991 Aug 15;88(16):7233-7.
PMID: 1871130

31. A brief period of hypoxia causes proteolysis of cytoskeletal proteins in hippocampal slices.
Arai A, Vanderklish P, Kessler M, Lee K, Lynch G.
Brain Res. 1991 Aug 2;555(2):276-80.
PMID: 1933340

32. Calpain inhibitors improve the recovery of synaptic transmission from hypoxia in hippocampal slices.
Arai A, Kessler M, Lee K, Lynch G.
Brain Res. 1990 Nov 5;532(1-2):63-8.
PMID: 2178038

33. Inhibition of long-term potentiation by an antagonist of platelet-activating factor receptors.
del Cerro S, Arai A, Lynch G.
Behav Neural Biol. 1990 Nov;54(3):213-7. No available.
PMID: 1964041

34. The effects of adenosine on the development of long-term potentiation.
Arai A, Kessler M, Lynch G.
Neurosci Lett. 1990 Oct 30;119(1):41-4.
PMID: 2097583

35. Anoxia reveals a vulnerable period in the development of long-term potentiation.
Arai A, Larson J, Lynch G.
Brain Res. 1990 Mar 19;511(2):353-7.
PMID: 2334854

36. Induction of ornithine decarboxylase by subseizure stimulation in the hippocampus in vivo.
Arai A, Baudry M, Staubli U, Lynch G, Gall C.
Brain Res Mol Brain Res. 1990 Feb;7(2):167-9.
PMID: 2160044

37. The nature and causes of hippocampal long-term potentiation.
Lynch G, Kessler M, Arai A, Larson J.
Prog Brain Res. 1990;83:233-50. Review.
PMID: 2168058

38. A charge-inverting mutation in the "linker" region of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptors alters agonist binding and gating kinetics independently of allosteric modulators.
Harms JE, Benveniste M, Kessler M, Stone LM, Arai AC, Partin KM.
J Biol Chem. 2014 Apr 11;289(15):10702-14. doi: 10.1074/jbc.M113.526921. Epub 2014 Feb 18.
PMID: 24550387

39. Prolactin-releasing peptide enhances synaptic transmission in rat thalamus.
Xia YF, Arai AC.
Neuroscience. 2011 Jan 13;172:1-11. doi: 10.1016/j.neuroscience.2010.10.079. Epub 2010 Nov 4.
PMID: 21056089

40. Modulation of agonist binding to AMPA receptors by 1-(1,4-benzodioxan-6-ylcarbonyl)piperidine (CX546): differential effects across brain regions and GluA1-4/transmembrane AMPA receptor regulatory protein combinations.

Montgomery KE, Kessler M, Arai AC.
J Pharmacol Exp Ther. 2009 Dec;331(3):965-74. doi: 10.1124/jpet.109.158014. Epub 2009 Aug 28.
PMID: 19717789

41. Factors that regulate KiSS1 gene expression in the hippocampus.
Arai AC, Orwig N.
Brain Res. 2008 Dec 3;1243:10-8. doi: 10.1016/j.brainres.2008.09.031. Epub 2008 Sep 19.
PMID: 18834866

42. The role of kisspeptin and GPR54 in the hippocampus.
Arai AC.
Peptides. 2009 Jan;30(1):16-25. doi: 10.1016/j.peptides.2008.07.023. Epub 2008 Aug 13. Review.
PMID: 18765263

43. Spontaneous activity in Purkinje cells: multi-electrode recording from organotypic cerebellar slice cultures.
Kessler M, Kiliman B, Humes C, Arai AC.
Brain Res. 2008 Jul 7;1218:54-69. doi: 10.1016/j.brainres.2008.04.063. Epub 2008 May 1.
PMID: 18533133

44. Physiological significance of high- and low-affinity agonist binding to neuronal and recombinant AMPA receptors.
Kessler M, Suzuki E, Montgomery K, Arai AC.
Neurochem Int. 2008 Jun;52(8):1383-93. doi: 10.1016/j.neuint.2008.02.009. Epub 2008 Mar 8.
PMID: 18403051

45. The fast kinetics of AMPA GluR3 receptors is selectively modulated by the TARPs gamma 4 and gamma 8.
Suzuki E, Kessler M, Arai AC.
Mol Cell Neurosci. 2008 May;38(1):117-23. doi: 10.1016/j.mcn.2008.01.018. Epub 2008 Mar 5.
PMID: 18395463

46. Mutations in ionotropic AMPA receptor 3 alter channel properties and are associated with moderate cognitive impairment in humans.
Wu Y, Arai AC, Rumbaugh G, Srivastava AK, Turner G, Hayashi T, Suzuki E, Jiang Y, Zhang L, Rodriguez J, Boyle J, Tarpey P, Raymond FL, Nevelsteen J, Froyen G, Stratton M, Futreal A, Gecz J, Stevenson R, Schwartz CE, Valle D, Huganir RL, Wang T.
Proc Natl Acad Sci U S A. 2007 Nov 13;104(46):18163-8. Epub 2007 Nov 7.
PMID: 17989220

47. Factors affecting guanine nucleotide binding to rat AMPA receptors.
Montgomery K, Suzuki E, Kessler M, Arai AC.
Brain Res. 2007 Oct 26;1177:1-8. Epub 2007 Aug 16.
PMID: 17884024

48. Pharmacology of ampakine modulators: from AMPA receptors to synapses and behavior.
Arai AC, Kessler M.
Curr Drug Targets. 2007 May;8(5):583-602. Review.
PMID: 17504103

49. Use of [3H]fluorowillardiine to study properties of AMPA receptor allosteric modulators.
Kessler M, Arai AC.
Brain Res. 2006 Mar 3;1076(1):25-41. Epub 2005 Oct 26.
PMID: 16256076

50. Cancer metastasis-suppressing peptide metastin upregulates excitatory synaptic transmission in hippocampal dentate granule cells.
Arai AC, Xia YF, Suzuki E, Kessler M, Civelli O, Nothacker HP.
J Neurophysiol. 2005 Nov;94(5):3648-52.

PMID: 16222076

51. AMPA receptor modulators have different impact on hippocampal pyramidal cells and interneurons.
Xia YF, Arai AC.
Neuroscience. 2005;135(2):555-67.
PMID: 16125852

52. C-terminal truncation affects kinetic properties of GluR1 receptors.
Suzuki E, Kessler M, Arai AC.
Mol Cell Neurosci. 2005 May;29(1):1-10.
PMID: 15866042

53. Positive alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor modulators have different impact on synaptic transmission in the thalamus and hippocampus.
Xia YF, Kessler M, Arai AC.
J Pharmacol Exp Ther. 2005 Apr;313(1):277-85. Epub 2004 Dec 30.
PMID: 15626725

54. Divergent effects of the purinoceptor antagonists suramin and pyridoxal-5'-phosphate-6-(2'-naphthylazo-6'-nitro-4',8'-disulfonate) (PPNDS) on alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptors.
Suzuki E, Kessler M, Montgomery K, Arai AC.
Mol Pharmacol. 2004 Dec;66(6):1738-47. Epub 2004 Sep 24.
PMID: 15448189

55. A novel mechanism for the facilitation of theta-induced long-term potentiation by brain-derived neurotrophic factor.
Kramár EA, Lin B, Lin CY, Arai AC, Gall CM, Lynch G.
J Neurosci. 2004 Jun 2;24(22):5151-61.
PMID: 15175384

56. Modulation of AMPA receptor kinetics differentially influences synaptic plasticity in the hippocampus.
Arai AC, Xia YF, Suzuki E.
Neuroscience. 2004;123(4):1011-24.
PMID: 14751292

57. Integrins regulate NMDA receptor-mediated synaptic currents.
Lin B, Arai AC, Lynch G, Gall CM.
J Neurophysiol. 2003 May;89(5):2874-8.
PMID: 12740418

58. Benzamide-type AMPA receptor modulators form two subfamilies with distinct modes of action.
Arai AC, Xia YF, Rogers G, Lynch G, Kessler M.
J Pharmacol Exp Ther. 2002 Dec;303(3):1075-85.
PMID: 12438530

59. Interactions between recording technique and AMPA receptor modulators.
Lin B, Colgin LL, Brücher FA, Arai AC, Lynch G.
Brain Res. 2002 Nov 15;955(1-2):164-73.
PMID: 12419533

60. Prolactin-releasing peptide (PrRP) promotes awakening and suppresses absence seizures.
Lin SH, Arai AC, España RA, Berridge CW, Leslie FM, Huguenard JR, Vergnes M, Civelli O.
Neuroscience. 2002;114(1):229-38.
PMID: 12207968

61. Effects of 5'-alkyl-benzothiadiazides on (R,S)-alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor biophysics and synaptic responses.

Arai AC, Xia YF, Kessler M, Phillips D, Chamberlin R, Granger R, Lynch G.
Mol Pharmacol. 2002 Sep;62(3):566-77.
PMID: 12181433

62. 5'-alkyl-benzothiadiazides: a new subgroup of AMPA receptor modulators with improved affinity.
Phillips D, Sonnenberg J, Arai AC, Vaswani R, Krutzik PO, Kleisli T, Kessler M, Granger R, Lynch G, Richard Chamberlin A.
Bioorg Med Chem. 2002 May;10(5):1229-48.
PMID: 11886787

63. The carboxyl terminus of the prolactin-releasing peptide receptor interacts with PDZ domain proteins involved in alpha-amino-3-hydroxy-5-methylisoxazole-4-propionic acid receptor clustering.
Lin SH, Arai AC, Wang Z, Nothacker HP, Civelli O.
Mol Pharmacol. 2001 Nov;60(5):916-23.
PMID: 11641419

64. GYKI 52466 has positive modulatory effects on AMPA receptors.
Arai AC.
Brain Res. 2001 Feb 23;892(2):396-400.
PMID: 11172790

65. Effects of the potent ampakine CX614 on hippocampal and recombinant AMPA receptors: interactions with cyclothiazide and GYKI 52466.
Arai AC, Kessler M, Rogers G, Lynch G.
Mol Pharmacol. 2000 Oct;58(4):802-13.
PMID: 10999951

66. A charge-inverting mutation in the "linker" region of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptors alters agonist binding and gating kinetics independently of allosteric modulators.
Harms JE, Benveniste M, Kessler M, Stone LM, Arai AC, Partin KM.
J Biol Chem. 2014 Apr 11;289(15):10702-14. doi: 10.1074/jbc.M113.526921. Epub 2014 Feb 18.