

Curriculum Vitae

Personal and Contact Information

Name: 김은준 (Eunjoon Kim, 金恩俊)
Title: 기초과학연구원 (Institute for Basic Science), 시냅스
뇌질환연구단 (Center for Synaptic Brain Dysfunctions), 단장
및 KAIST, 생명과학과, 교수
Contact: 대전광역시 유성구 구성동 373-1
KAIST 생명과학과
Tel: 042-350-2633; Fax: 042-350-8127
E-mail: kime@kaist.ac.kr
Home page: <http://molneuro.kaist.ac.kr/>

Research Interests

1. Mechanisms underlying synapse formation with focus on synaptic adhesion, spine morphogenesis, and structural and functional synaptic plasticity.
2. Association of synaptic proteins with various neuropsychiatric disorders, including autism spectrum disorders, ADHD, schizophrenia, and intellectual disability.

Educational background and research experience

1982.03 – 86.02 부산대학교 약학과 (학사)
1986.03 – 88.02 한국과학기술원 생물과학과 (석사)
1988.03 – 91.08 생명공학연구소 유전자은행 (연구원)
1991.09 – 94.12 Michigan State University, Dept of Pharmacology and Toxicology (PhD)
1995.01 – 97.02 Harvard Medical School, Dept of Neurobiology and Howard Hughes Medical Institute (postdoc)
1997.03 – 00.02 부산대학교 약학과 (전임강사, 조교수)
2000.03 – 현재 KAIST 생명과학과 (조교수, 부교수, 교수)
2003.07 – 2012.05 시냅스생성 창의연구단 (단장)
2012.06 – 현재 기초과학연구원 (Institute for Basic Science), 시냅스뇌질환 연구단 (Center for Synaptic Brain Dysfunctions) (단장)

Honors and awards

2014. 올해의 카이스트인상, KAIST
2013. 포스코 청암상, 포스코청암재단

2012. 올해의 우수박사학위 논문지도상, 한국과학기술한림원 및 S-OIL
과학문화재단
2012. 인촌상, 인촌기념회 및 동아일보사
2012. 생명과학상, 한국분자세포생물학회
2011. 석좌교수, KAIST
2011. 학술대상, KAIST
2010. 정회원, 한국과학기술한림원
2005. 생명약학우수논문상, 생명약학회
2004. 제 8 회 젊은과학자상, 한국과학기술한림원 및 과학기술부
2003. 학술상, KAIST
1991. 국비장학생, 교육부

Editorial boards

- 2012 – present. eLife.
- 2012 – present. Experimental Neurobiology.
- 2009 – present. Neurosignals.
- 2007 – present. Frontiers in Molecular Neuroscience.
- 2012 – 2013. Molecules and Cells.
- 2006 – 2009. Journal of Biochemistry.

Publications

136. Ha S, Lee D, Cho YS, Chung C, Yoo YE, Kim J, Lee J, Kim W, Tanaka-Yamamoto K, and **Kim E.** (2016). Cerebellar Shank2 regulates excitatory synapse density, motor coordination, and specific repetitive and anxiety-like behaviors. **J Neurosci** 36:12129-12143.
135. Yan Z, **Kim E**, Datta D, Lewis D, and Soderling S. (2016). Synaptic actin dysregulation, a convergent mechanism of mental disorders? **J Neurosci** 36(45):11411-11411.
134. Lee D, **Kim E**, and Tanaka-Yamamoto K. (2016). Diacylglycerol kinases in the coordination of synaptic plasticity. **Front Cell Dev Biol** 4:92.
133. Lim CS, Kim H, Yu NK, Kang SJ, Kim T, Ko HG, Lee J, Yang JE, Ryu HH, Park T, Gim J, Nam HJ, Baek SH, Wegener S, Schmitz D, Boeckers TM, Lee MG, **Kim E**, Lee J, Lee YS, Kaang BK. (2016). Enhancing inhibitory synaptic function reverses spatial memory. **Neuropharmacol** 112(Pt A):104-112.
132. Lie E, Ko JS, Choi SY, Roh JD, Cho YS, Noh R, Kim D, Li Y, Kang H, Cho TY, Nam J, Mah W, Lee D, Lee SG, Kim HM, Kim H, Choi SY, Um JW, Kang MG, Bae YC, Ko J, and **Kim E.** (2016). SALM4 suppresses excitatory synapse development by cis-inhibiting trans-synaptic SALM3–LAR adhesion. **Nat Commun** 7:12328.
131. Lee E, Lee J, and **Kim E.** (2016). Excitation/inhibition imbalance in animal models of ASDs. **Biol Psychiatry** 112(Pt A):104-112.

130. Lee E, Rhim I, Lee JW, Ghim JW, Lee S, **Kim E***, and Jung M*. (2016). Enhanced neuronal activity in the medial prefrontal cortex during social approach behavior. **J Neurosci** 36:6926-36.
129. Choi Y, Nam J, Whitcomb DJ, Song YS, Kim D, Jeon S, Um JW, Lee SG, Woo J, Kwon S, Li Y, Mah W, Kim HM, Ko J, Cho K, and **Kim E.** (2016). SALM5 trans-synaptically interacts with LAR-RPTPs in a splicing-dependent manner to regulate synapse development. **Sci Rep** 6:26676.
128. Um JW, Choi G, Park D, Kim D, Jeon S, Kang H, Mori T, Papadopoulos T, Yoo T, Lee Y, **Kim E**, Tabuchi K and Ko J. (2016). IQ Motif and SEC7 Domain-containing Protein 3 (IQSEC3) interacts with gephyrin to promote inhibitory synapse formation. **J Biol Chem** 291:10119-30.
127. Kang J, Park H, and **Kim E.** (2016). IRSp53/BAIAP2 in dendritic spine development, NMDA receptor regulation, and psychiatric disorders. **Neuropharmacol** 100:27-39.
126. Jang S, Oh D, Lee Y, Hosy E, Shin H, van Riesen C, Whitcomb D, Warburton JM, Jo J, Kim D, Kim SG, Um SM, Kwon SK, Kim MH, Roh JD, Woo J, Jun H, Lee D, Mah W, Kim H, Kaang BK, Cho K, Rhee JS, Choquet D, and **Kim E.** (2016). Synaptic adhesion molecule IgSF11 regulates synaptic transmission and plasticity. **Nat Neurosci** 19:84-93.
125. Lee D, Yamamoto Y, **Kim E**, and Tanaka-Yamamoto K. (2015). Functional and physical interaction of diacylglycerol kinase ζ with protein kinase α is required for cerebellar long-term depression. **J Neurosci** 35:15453-65.
124. Park H, Yang J, Kim R, Li Y, Lee Y, Lee C, Park J, Lee D, Kim H, and **Kim E.** (2015). Mice lacking the PSD-95-interacting E3 ligase, Dorfin/Rnf19a, display reduced adult neurogenesis, enhanced long-term potentiation, and impaired contextual fear conditioning. **Sci Rep** 5:16410.
123. Li Y, Zhang P, Choi TY, Park SK, Park H, Lee EJ, Lee D, Roh JD, Mah W, Kim R, Kim Y, Kwon H, Bae YC, Choi SY, Craig AM, and **Kim E.** (2015). Splicing-dependent Trans-synaptic SALM3-LAR-RPTP Interactions Regulate Excitatory Synapse Development and Locomotion. **Cell Rep** 12:1618-30.
122. Choi SY, Han K, Cutforth T, Chung W, Park H, Lee D, Kim R, Kim MH, Choi Y, Shen K, and **Kim E.** (2015). Mice lacking the synaptic adhesion molecule Neph2/Kirrel3 display moderate hyperactivity and defective novel object preference. **Front Cell Neurosci** 8:17.
121. Whitcomb D, Hogg E, Regan P, Piers T, Narayan P, Whitehead G, Winters B, Kim DH, **Kim E**, St George-Hyslop P, Klenerman D, Collingridge G, Jo J, and Cho K. (2015). Intracellular oligomeric amyloid-beta rapidly regulates GluA1 subunit of AMPA receptor in the hippocampus. **Sci Rep** 5:10934.
120. Kang J and **Kim E.** (2015). Suppression of NMDA receptor function in mice prenatally exposed to valproic acid improves social deficits and repetitive behaviors. **Front Mol Neurosci** 8:17.
119. Lee EJ, Lee H, Huang TNE, Chung C, Shin W, Kim K, Koh JY, Hsueh YP, and **Kim E.** (2015). Trans-synaptic zinc mobilization improves social interaction in two mouse models of autism through NMDAR activation. **Nat Commun** 6:7168.

118. Varea O, Martin-de-Saavedra MD, Kopeikina KJ, Schürmann B, Fleming H, Patel J, Bach A, Jang S, Peles E, **Kim E**, and Penzes P. (2015). Synaptic abnormalities and cytoplasmic glutamate receptor aggregates in *Cntnap2/Caspr2* knockout neurons. **Proc Natl Acad Sci USA** 112:6176-81.
117. Lee J, Chung C, Ha S, Lee D, Kim DY, Kim H, and **Kim E**. (2015). Shank3-mutant mice lacking exon 9 show altered excitation/inhibition balance, enhanced rearing, and spatial memory deficit. **Front Cell Neurosci** 9:94.
116. Chung W, Choi SY, Lee E, Park H, Kang J, Park H, Choi Y, Lee D, Park SG, Kim R, Cho YS, Choi J, Kim MH, Lee JW, Lee S, Rhim I, Jung MH, Kim D, Bae YC, and **Kim E**. (2015). Social deficits in *IRSp53* mutant mice improved by NMDAR and mGluR5 suppression. **Nat Neurosci** 18:425-443.
115. Ylikallio E, Kim D, Isohanni P, Auranen M, Lönnqvist T, **Kim E**, and Tynjismaa H. (2015). Dominant transmission of de novo KIF1A motor domain variant underlying pure spastic paraplegia. **Eur J Hum Genet** 23:1427-30.
114. Lee EJ, Choi S, and **Kim E**. (2015). NMDA receptor dysfunction in autism spectrum disorders. **Curr Opin Pharmacol** 20:8-13.
113. Lee JR, Srour M, Kim D, Hamdan FF, Lim SH, Brunel-Guitton C, Décarie JC, Rossignol E, Mitchell GA, Schreiber A, Moran R, Van Haren K, Richardson R, Nicolai J, Oberndorff KM, Wagner JD, Boycott KM, Rahikkala E, Junna N, Tynjismaa H, Cuppen I, Verbeek NE, Stumpel CT, Willemsen MA, de Munnik SA, Rouleau GA, Kim E, Kamsteeg EJ, Kleefstra T, and Michaud JL. (2015). De novo mutations in the motor domain of KIF1A cause cognitive impairment, spastic paraparesis, axonal neuropathy and cerebellar atrophy. **Hum Mutat** 36:69-78.
112. Um JW, Kim KH, Park BS, Choi Y, Kim D, Kim CY, Kim SJ, Kim M, Ko JS, Lee SG, Choi G, Nam J, Heo WD, **Kim E**, Lee JO, Ko J, and Kim HM. (2014). Structural basis for LAR-RPTP/Slitrk complex-mediated synaptic adhesion. **Nat Commun** 5:5423.
111. Kimura T, Whitcomb DJ, Jo J, Regan P, Piers T, Heo S, Brown C, Hashikawa T, Murayama M, Seok H, Sotiropoulos I, **Kim E**, Collingridge GL, Takashima A, and Cho K. (2014). Microtubule associated protein tau (MAPT) is essential for long-term depression in the hippocampus. **Phil Trans R Soc B** 369:20130144.
110. Lee H, Lee EJ, Song YS, and **Kim E**. (2014). LTD-inducing stimuli promote cleavage of the synaptic adhesion molecule NGL-3 through NMDA receptors, matrix metalloproteinases, and presenilin/ γ -secretase. **Phil Trans R Soc B** 369:20130158.
109. Song YS and **Kim E**. (2013). Presynaptic proteoglycans: sweet organizers of synapse development. **Neuron**, 79:609-11.
108. Song YS, Lee HJ, Prosser P, Itohara S, and **Kim E**. (2013). Trans-induced cis interaction in the tripartite NGL-1, netrin-G1, and LAR adhesion complex promotes excitatory synaptic development. **J Cell Sci** 126:4926-38.
107. Won H, Mah W, and **Kim E**. (2013). Autism spectrum disorder causes, mechanisms, and treatments: focus on neuronal synapses. **Front Mol Neurosci** 6:19.
106. Woo J, Kwon SK, Nam J, Choi S, Takahashi H, Krueger D, Park J, Lee Y, Bae JY, Lee D, Ko J, Kim H, Kim MH, Bae YC, Chang S, Craig AM, and **Kim E**. (2013). IgSF9b is coupled to neuroligin 2 via S-SCAM to promote inhibitory synapse development. **J. Cell Biol** 201:929-44.

105. Bae YS, Chung W, Han K, Park KY, Kim H, **Kim E**, Kim MH. (2013). Down-regulation of RalBP1 expression reduces seizure threshold and synaptic inhibition in mice. **Biochem Biophys Res Commun** 433:175-80.
104. Sim SE, Lee HR, Kim JI, Choi SL, Bakes J, Jang DJ, Lee K, Han K, **Kim E**, Kaang BK. (2013). Elevated RalA activity in the hippocampus of PI3Ky knock-out mice lacking NMDAR-dependent long-term depression. **BMB Rep** 46: 103-6.
103. Song S, Jang S, Park J, Bang S, Choi S, Kwon KY, Zhuang X, **Kim E**, Chung J. (2013). Characterization of PINK1 (PTEN-induced putative kinase 1) mutations associated with Parkinson disease in mammalian cells and Drosophila. **J Biol Chem** 288:5660-72.
102. Yim YS, Kwon Y, Nam J, Yoon HI, Lee K, Kim DG, **Kim E**, Kim CH, and Ko J. (2013). Slitrks control excitatory and inhibitory synapse formation with LAR receptor protein tyrosine phosphatases. **Proc Natl Acad Sci USA** 110:4057-62.
101. Yoon SH, Bae YS, Mun MS, Park KY, Ye SK, **Kim E**, Kim MH. Developmental retardation, microcephaly, and peptiduria in mice without aminopeptidase P1. (2012). **Biochem Biophys Res Commun** 429:204-209.
100. Yoon KJ, Lee HR, Jo YS, An K, Jung SY, Jeong MW, Kwon SK, Kim NS, Jeong HW, Ahn SH, Kim KT, Lee K, **Kim E**, Kim JH, Choi JS, Kaang BK, Kong YY. (2012). Mind bomb-1 is an essential modulator of long-term memory and synaptic plasticity via the Notch signaling pathway. **Mol Brain** 5:40.
99. Park AR, Oh D, Lim SH, Choi J, Moon J, Yu DY, Park SG, Heisterkamp N, **Kim E**, Yung PK, Lee JR. (2012). Regulation of dendritic arborization by BCR Rac1 GTPase-activating protein, a new substrate of protein tyrosine phosphatase receptor T. **J Cell Sci** 125:4518-31.
98. Won H, Lee HR, Gee HY, Mah W, Kim JI, Lee J, Ha S, Chung C, Jung ES, Cho YS, Park SG, Lee JS, Lee K, Kim D, Bae YC, Kaang BK*, Lee MG*, and **Kim E***. (*equal contribution) (2012) Autistic-like social behavior in Shank2-mutant mice improved by restoring NMDA receptor function. **Nature** 486:261-5. (Highlighted in 'Nature Reviews Drug Discovery', 'Nature Reviews Neuroscience' and 'SFARI')
97. Seo J, Kim K, Jang S, Han S, Choi S, and **Kim E**. (2012). Regulation of hippocampal LTP and LTD by diacylglycerol kinases. **Hippocampus** 22:1018-1026.
96. Sheng M and **Kim E**. (2011). The postsynaptic organization of synapses. **Cold Spring Harb Perspect Biol** 3: a005678.
95. Kim JI, Lee HR, Sim SE, Baek J, Yu NK, Choi JH, Ko HG, Lee YS, Park SW, Kwak C, Ahn SJ, Choi SY, Kim H, Kim KH, Backx PH, Bradley CA, **Kim E**, Jang DJ, Lee K, Kim SJ, Zhuo M, Collingridge GL, Kaang BK. (2011). PI3Ky is required for NMDA receptor-dependent long-term depression and behavioral flexibility. **Nat Neurosci** 14:1447-54.
94. Nam J, Mah W, and **Kim E**. (2011). The SALM/Lrfrn family of leucine-rich repeat-containing cell adhesion molecules. **Semin Cell Dev Biol** 22:492-8.
93. Won H, Mah W, Kim E, Kim JW, Hahm EK, Kim MH, Cho S, Kim JJ, Jang H, Cho SC, Kim BN, Shin MS, Seo J, Jeong J, Choi SY, Kim D, Kang C, and **Kim E**. (2011). GIT1 is associated with attention deficit/hyperactivity disorder (ADHD) and ADHD-like behaviors in mice. **Nat Med**, 17:566-72. (Highlighted in 'News and Views, Nature

Asia-Pacific, Nat Med Podcast, Nat Med Spoonful of Medicine, Nature SciBX', and 'Faculty of 1000')

92. Hamdan FF, Gauthier J, Araki Y, Lin DT, Yoshizawa Y, Higashi K, Park A, Spiegelman D, Dobrzyniecka S, Piton A, Tomitori H, Daoud H, Massicotte C, Henrion E, Dialo O, S2D group, Shekarabi M, Marineau C, Shevell M, Maranda B, Mitchell G, Nadeau A, D'Anjou G, Vanasse M, Srour M, Lafrenière RG, Drapeau P, Lacaille JC, **Kim E**, Lee JR, Igarashi K, Hukanir RL, Rouleau GA, and Michaud JL. (2011). Excess of de novo deleterious mutations in genes associated with glutamatergic systems in non-syndromic intellectual disability. **Am J Hum Genet** 88:306-16.
91. Yang J, Seo J, Nair R, Han S, Jang S, Kim K, Han K, Paik SK, Choi J, Lee S, Bae YC, Topham MK, Prescott SM, Rhee JS, Choi SY, and **Kim E**. (2011). DGK regulates presynaptic release during mGluR-dependent LTD. **EMBO J** 30:165-80.
90. Han S, Nam J, Li Y, Kim S, Cho SH, Cho YS, Choi SY, Choi J, Han K, Kim Y, Na M, Kim H, Bae YC, Choi SY, and **Kim E**. (2010). Regulation of dendritic spines, spatial memory, and embryonic development by the TANC family of PSD-95-interacting proteins. **J Neurosci** 30: 15102-12.
89. Oh D, Han S, Seo J, Lee JR, Choi J, Groffen J, Kim K, Cho YS, Choi HS, Shin H, Woo J, Won H, Park SK, Kim SY, Jo J, Whitcomb DJ, Cho K, Kim H, Bae YC, Heisterkamp N, Choi SY, and **Kim E**. (2010). Regulation of synaptic Rac1 activity, LTP maintenance, and learning and memory by BCR and ABR Rac GTPase-activating proteins. **J Neurosci** 30: 14134-44.
88. Mah W, Ko J, Nam J, Han K, Chung W, and **Kim E**. (2010). Selected SALM family proteins regulate synapse formation. **J Neurosci** 30:5559-68. (Highlighted in 'This Week in The Journal')
87. Im YJ, Kang GB, Lee JH, Park KR, Song HE, **Kim E**, Song WK, Park D, and Eom SH. (2010). Structural basis for asymmetric association of the Pix coiled-coil and Shank PDZ. **J Mol Biol** 397:457-66.
86. Kwon SK, Woo J, Kim SY, Kim H, and **Kim E**. (2010). Trans-synaptic adhesions between netrin-G ligand-3 (NGL-3) and receptor tyrosine phosphatases LAR, PTP^{Net}, and PTP^{Shank} via specific domains regulate excitatory synapse formation. **J Biol Chem** 285:13966-78.
85. Lee HW, Kim Y, Han K, Kim H and **Kim E**. (2010). The phosphoinositide 3 phosphatase MTMR2 interacts with PSD-95 and maintains excitatory synapses by modulating endosomal traffic. **J Neurosci** 30:5508-18.
84. Lee JS, Lee YM, Kim JY, Park HW, Grinstein S, Orłowski J, **Kim E**, Kim KH, Lee MG. (2010). Pix upregulates Na⁺/H⁺ exchanger 3 through a Shank2-mediated protein-protein interaction. **J Biol Chem** 285:8104-13.
83. Kim K, Yang J and **Kim E**. (2010). Diacylglycerol kinases in the regulation of dendritic spines. **J Neurochem** 112:577-87.
82. Lim SH, Kwon SK, Lee MK, Moon J, Jeong DG, Park E, Kim SJ, Park BC, Rhu SE, Yu DY, **Kim E**, Myung PK and Lee JR. (2009). Regulation of synapse formation by PTPRT through interaction with cell adhesion molecules and Fyn. **EMBO J** 28:3564-78.
81. Han K, Kim MH, Seeburg D, Seo J, Verpelli C, Han S, Chung HS, Ko J, Lee HW, Kim K, Heo W, Meyer T, Kim H, Sala C, Choi SY, Sheng M and **Kim E**. (2009). Regulated

- RalBP1 binding to RalA and PSD-95 controls AMPA receptor endocytosis and LTD. **PLoS Biol** 7:e1000187. (Highlighted in 'Faculty of 1000')
80. Kim E. and Sheng M. (2009). The postsynaptic density. **Curr Biol** 19:R723-4.
 79. Woo J, Kwon SK and Kim E. (2009). The NGL family of leucine-rich repeat-containing synaptic adhesion molecules. **Mol Cell Neurosci** 42:1-10.
 78. Kim, SM. Choi, KY. Cho IH, Rhu JH, Kim SH, Park CS, Kim E and Song WK. (2009). Regulation of dendritic spine morphology by SPIN90, a novel Shank binding partner. **J Neurochem** 109:1106-1117.
 77. Woo J, Kwon SK, Choi S, Kim S, Lee JR, Dunah AW, Sheng M and Kim E. (2009). Trans-synaptic adhesion between NGL-3 and LAR regulates the formation of excitatory synapses. **Nat Neurosci** 12:428-37. (Highlighted in 'Faculty of 1000')
 76. Gee HY, Kim YW, Jo MJ, Namkung W, Kim JY, Park HW, Kim KS, Kim H, Baba A, Yang J, Kim E, Kim KH and Lee MG. (2009). Synaptic scaffolding molecule binds to and regulates vasoactive intestinal polypeptide type-1 receptor in epithelial cells. **Gastroenterology** 137:607-17.
 75. Kim K, Yang J, Zhong XP, Kim MH, Kim YS, Lee HW, Han S, Choi J, Han K, Seo J, Prescott SM, Topham MK, Bae YC, Koretzky G, Choi SY and Kim E. (2009). Synaptic removal of diacylglycerol by DGK and PSD-95 regulates dendritic spine maintenance. **EMBO J** 28:1170-1179. (Highlighted in 'Have you seen?')
 74. Kim MH, Choi J, Yang J, Chung W, Kim JH, Paik SK, Kim K, Han S, Won H, Bae Y, Cho SH, Seo J, Bae YC, Choi SY and Kim E. (2009). Enhanced NMDA receptor-mediated synaptic transmission, enhanced long-term potentiation, and impaired learning and memory in mice lacking IRSp53. **J Neurosci** 29: 1586-1595.
 73. Lee HW, Choi J, Shin H, Kim K, Yang J, Na M, Choi SY, Kang GB, Eom SH, Kim H and Kim E. (2008). Preso, a novel PSD-95-interacting FERM and PDZ domain protein that regulates dendritic spine morphogenesis. **J Neurosci** 28: 14546-14556.
 72. Jeon D, Song I, Guido W, Kim K, Kim E, Oh U and Shin HS. (2008). Ablation of Ca²⁺ channel beta 3 subunit leads to enhanced NMDA receptor-dependent long-term potentiation and improved long-term memory. **J Biol Chem** 238:12093-12101.
 71. Jeon JH, Kim KY, Kim JH, Baek A, Cho H, Lee YH, Kim JW, Kim D, Han SH, Lim JS, Kim KI, Yoon DY, Kim SH, Oh GT, Kim E and Yang Y. (2008). A novel adipokine CTRP1 stimulates aldosterone production. **FASEB J** 22:1502-1511.
 70. Han K. and Kim E. (2008). Synaptic adhesion molecules and PSD-95. **Prog Neurobiol** 84:263-283.
 69. Lee SH, Lim CS, Park H, Lee JA, Han JH, Kim H, Cheang YH, Lee SH, Lee YS, Ko HG, Jang DH, Kim H, Miniaci MC, Bartsch D, Kim E, Bailey CH, Kandel ER and Kaang BK. (2007). Nuclear Translocation of CAM-Associated Protein Activates Transcription for Long-Term Facilitation in Aplysia. **Cell** 129:801-812.
 68. Ko J. and Kim E. (2007). Leucine-rich repeat (LRR) proteins of synapses. **J Neurosci Res** 85:2824-2832.
 67. Lee JH, Richter W, Namkung W, Kim KH, Kim E, Conti M and Lee MG. (2007). Dynamic regulation of cystic fibrosis transmembrane conductance regulator by competitive interactions of molecular adaptors. **J Biol Chem** 282:10414-10422.

66. Kim S, Burette A, Chung HS, Kwon SK, Woo J, Lee HW, Kim K, Kim H, Weinberg RJ and **Kim E.** (2006). NGL family PSD-95-interacting adhesion molecules regulate excitatory synapse formation. **Nat Neurosci** 9:1294-1231. (Highlighted in 'News and Views' and 'Faculty of 1000')
65. Kim KY, Kim JK, Han SH, Lim JS, Kim KI, Cho DH, Lee MS, Lee JH, Yoon DY, Yoon SR, Chung JW, Choi I, **Kim E** and Yang Y. (2006). Adiponectin is a negative regulator of NK cell cytotoxicity. **J Immunol** 176:5958-5964.
64. Choi S, Ko J, Lee JR, Lee HW, Kim K, Chung HS, Kim H and **Kim E.** (2006). ARF6 and EFA6A regulate the development and maintenance of dendritic spines. **J Neurosci** 26:4811-4819.
63. Ko J, Kim S, Chung HS, Kim K, Han K, Kim H, Jun H, Kaang BK and **Kim E.** (2006). SALM Synaptic Cell Adhesion-like Molecules Regulate the Differentiation of Excitatory Synapses. **Neuron** 50:233-245. (Highlighted in 'Faculty of 1000')
62. Ko J, Yoon C, Piccoli G, Chung HS, Kim K, Lee JR, Lee HW, Kim H, Sala C and **Kim E.** (2006). Organization of the presynaptic active zone by ERC2/CAST1-dependent clustering of the tandem PDZ protein syntenin-1. **J Neurosci** 26:963-970.
61. Han WS, Kim KH, Jo MJ, Lee JH, Yang JH, Doctor RB, Moe OW, Lee J, **Kim E** and Lee MG. (2005). Shank2 associates with and regulates Na⁺/H⁺ exchanger 3. **J Biol Chem** 281:1461-1469.
60. **Kim E.** and Ko J. (2006). Molecular organization and assembly of the postsynaptic density of excitatory brain synapses. **Results Probl Cell Differ** 43:1-23.
59. Lee HW, Ko J and **Kim E.** (2006). Analysis of PDZ domain interactions using yeast two-hybrid and coimmunoprecipitation assays. **Methods Mol Biol** 332:233-244.
58. Ko J and **Kim E.** (2006). Clustering assay for studying the interaction of membrane proteins with PDZ domain proteins. **Methods Mol Biol** 332:245-253.
57. McWilliams R, Breusegem S, Brodsky K, **Kim E,** Levi M and Doctor RB. (2005). Shank2E binds Na/Pi co-transporter at the apical membrane of proximal tubule cells. **Am J Physiol Cell Physiol** 289:C1042-C1051.
56. Hwang JI, Kim HS, Lee JR, **Kim E,** Ryu SH and Suh PG. (2005). The interaction of phospholipase C-beta3 with shank2 regulates mGluR-mediated calcium signal. **J Biol Chem** 280:12467-73.
55. Choi J, Ko J, Racz B, Burette A, Lee JR, Kim S, Na M, Lee HW, Kim K, Weinberg RJ and **Kim E** (2005). Regulation of dendritic spine morphogenesis by IRSp53, a downstream effector of Rac1 and Cdc42 small GTPases. **J Neurosci** 25:869-879.
54. **Kim E** and Sheng M. (2004). PDZ domain proteins of synapses. **Nat Rev Neurosci** 5:771-781.
53. Jee C, Lee J, Lee JI, Lee WH, Park BJ, Yu JR, Park E, **Kim E,** Ahnn J. (2004). SHN-1, a Shank homologue in *C. elegans*, affects defecation rhythm via the inositol-1,4,5-trisphosphate receptor. **FEBS Lett** 561:29-36.
52. Lee J, Shin H, Choi J, Ko J, Kim S, Lee H, Kim K, Rho SH, Lee JH, Song HE, Eom SH and **Kim E.** (2004). An intramolecular interaction between the FHA domain and a coiled coil negatively regulates the kinesin motor KIF1A. **EMBO J** 23:1506-1515.

51. Kim J. Y, Han W, Namkung W, Lee JH, Kim KH, Shin H, **Kim E**, Lee MG. (2004). Inhibitory regulation of cystic fibrosis transmembrane conductance regulator anion-transporting activities by Shank2. **J Biol Chem** 279:10389-10396.
50. Im YJ, Lee JH, Park SH, Park SJ, Rho SH, Kang GB, **Kim E**, and Eom SH. (2003). Crystal structure of the Shank PDZ-ligand complex reveals a class I PDZ interaction and a novel PDZ-PDZ dimerization. **J Biol Chem** 278: 48099-104.
49. Ko J, Na M, Kim S, Lee JR, and **Kim E**. (2003). Interaction of the ERC family of RIM-binding proteins with the liprin-a family of multidomain proteins. **J Biol Chem** 278:42377-85.
48. Park E, Na M, Choi J, Kim S, Lee JR, Yoon J, Park D, Sheng M, and **Kim E**. (2003). The Shank family of postsynaptic density proteins interacts with and promotes synaptic accumulation of the PIX guanine nucleotide exchange factor for Rac1 and Cdc42. **J Biol Chem** 278:19220-19229.
47. Huh M, Han JH, Lim CS, Lee SH, Kim S, **Kim E**, and Kaang BK. (2003). Regulation of neuritogenesis and synaptic transmission by msec7-1, a guanine nucleotide exchange factor, in cultured Aplysia neurons. **J Neurochem** 85:282-285.
46. Shin H, Wyszynski M, Huh KH, Valtschanoff JG, Lee JR, Ko J, Streuli M, Weinberg RJ, Sheng M, and **Kim E**. (2003). Association of the kinesin motor KIF1A with the multimodular protein liprin-a. **J Biol Chem** 278:11393-11401. (Highlighted in 'Faculty of 1000')
45. Im Y, Park S, Rho S, Lee J, Kang G, Sheng M, **Kim E** and Eom S. (2003). Crystal structure of GRIP1 PDZ6-peptide complex reveals the structural basis for class II PDZ target recognition and PDZ domain-mediated multimerization. **J Biol Chem** 278:8501-8507.
44. Ko J, Kim S, Valtschanoff JG, Shin H, Lee JR, Sheng M, Premont RT, Weinberg RJ, and **Kim E**. (2003). Interaction between liprin- and GIT1 is required for AMPA receptor targeting. **J Neurosci** 23:1667-1677.
43. Kim S, Ko J, Shin H, Lee JR, Lim C, Han JH, Altmann WD, Garner CC, Gundelfinger ED, Premont RT, Kaang BK, and **Kim E**. (2003). The GIT family of proteins forms multimers and associates with the presynaptic cytomatrix protein Piccolo. **J Biol Chem** 278:6291-6300.
42. Lee J. R, Shin H, Ko J, Choi J, Lee H, and **Kim E**. (2003). Characterization of the movement of the kinesin motor KIF1A in living cultured neurons. **J Biol Chem** 278: 2624-2629.
41. Park S, Im Y, Rho S, Lee J, Yang S, **Kim E** and Eom S. (2002). Crystallization and preliminary X-ray crystallographic studies of the PDZ domain of Shank1 from *Rattus norvegicus*. **Acta Crystallographica D** 58: 1353-1355.
40. Park S, Im Y, Rho S, Lee J, Yang S, **Kim E** and Eom S. (2002). Crystallization and preliminary X-ray crystallographic studies of the sixth PDZ domain of glutamate-receptor interacting protein 1 (GRIP1) from *Rattus norvegicus*. **Acta Crystallographica D** 58:1063-1065.
39. Mok H, Shin H, Kim S, Lee J, Yoon J, and **Kim E**. (2002). Association of the kinesin superfamily motor protein KIF1Ba with PSD-95, SAP97 and S-SCAM PDZ proteins. **J Neurosci** 22:5253-5258.

38. Choi J, Ko J, Park E, Lee J, Yoon J, Lim S., and **Kim E.** (2002). Phosphorylation of stargazin by PKA regulates its interaction with PSD-95. **J Biol Chem** 277, 12359-12363. (Highlighted in 'Faculty of 1000')
37. Wyszynski M, **Kim E**, Dunah AW, Passafaro M, Valtschanoff JG, Serra-Pages C, Streuli M, Weinberg RJ, and Sheng M. (2002). Interaction between GRIP and liprin-a/SYD2 required for AMPA receptor targeting. **Neuron**, 34, 39-52.
36. Pak, D., Yang, S., Rudolph, S., **Kim E** and Sheng, M. (2001). Regulation of dendritic spine morphology by SPAR, a PSD-95-associated RapGAP. **Neuron**, 31, 289-303.
35. Kim, J., Rho, S, Im, Y, **Kim E** and Eom, S. (2001). Crystalization and preliminary X-ray diffraction studies of the guanylate kinase-like domain of PSD-95 protein from rat. **Acta Crystallographica D** 57, 616-617.
34. Lim S, Sala C, Yoon J, Park S, Kuroda S, Sheng M and **Kim E.** (2001). Sharpin, a novel postsynaptic density protein that directly interacts with the Shank family of proteins. **Mol Cell Neurosci** 17, 385-397.
33. Naisbitt S, Valtschanoff J, Allison DW, Sala C, **Kim E**, Craig AM, Weinberg RJ and Sheng M. (2000). Interaction of the postsynaptic density-95/guanylate kinase domain-associated protein complex with a light chain of myosin-V and dynein. **J Neurosci** 20, 4524-4534.
32. Hwang JI, Heo K, Shin KJ, **Kim E**, Yun CH, Ryu SH, Shin HS, Suh PG. (2000) Regulation of Phospholipase C-beta3 by Na⁺/H⁺ Exchanger Regulatory Factor2. **J Biol Chem** 275,16632-16637.
31. Sheng M and **Kim E.** (2000). The Shank family of scaffold proteins. **J Cell Sci** 113, 1851-1856.
30. Shin H, Hsueh YP, Yang FC, **Kim E** and Sheng M. (2000). An intramolecular Interaction between the SH3 Domain and the Guanylate Kinase-like Domain in the PSD-95 Family of MAGUK Proteins. **J Neurosci** 20, 3580-3587.
29. Tiffany AM, Manganas LN, **Kim E**, Sheng M and Trimmer JS. (2000). PSD-95 and SAP-97 exhibit distinct mechanisms for regulating K⁺ channel surface expression and clustering. **J Cell Biol** 148, 173-188.
28. Lim S, Naisbitt S, Yoon J, Hwang JI, Suh PG, Sheng M and **Kim E.** (1999). Characterization of the Shank family of synaptic proteins: multiple genes, alternative splicing, and differential expression in brain and development. **J Biol Chem** 274, 29510-29518.
27. Naisbitt S, **Kim E**, Tu J, Xiao B, Sala C, Valtschanoff J, Weinberg R, Worley P, and Sheng M. (1999). Shank, a novel family of postsynaptic density proteins that binds to the NMDA receptor/PSD-95/GKAP complex and cortactin. **Neuron** 23, 569-582.
26. Wyszynski M, Valtschanoff JG, Naisbitt S, Dunah A, Rao A, **Kim E**, Standaert D, Craig AM, Weinberg R, and Sheng M. (1999). Association of AMPA receptors with a subset of GRIP proteins in vivo. **J Neurosci** 19, 6528-6537.
25. Wyszynski M, **Kim E**, Yang FC, and Sheng M. (1998). Biochemical and immunocytochemical characterization of GRIP, a putative AMPA receptor anchoring protein, in rat brain. **Neuropharmacol** 37, 1335-1344.

24. Kuhlendahl S, Spangenberg O, Konrad M, **Kim E** and Garner CC. (1998). Functional analysis of the guanylate kinase domain in the synapse-associated protein SAP97. **Eur J Biochem** 252, 305-313.
23. Rao A, **Kim E**, Sheng M and Craig AM. (1998). Heterogeneity in the molecular composition of excitatory postsynaptic sites during development of hippocampal neurons in culture. **J Neurosci** 18, 1217-1229.
22. **Kim E**, DeMarco SJ, Marfatia SM, Chishti AH, Sheng M and Strehler EE. (1998). Plasma membrane Ca²⁺ ATPase isoform 4b binds to membrane-associated guanylate kinase (MAGUK) proteins via their PDZ domains. **J Biol Chem** 273, 1591-1595.
21. Thomas U, **Kim E**, Kuhlendahl S, Koh YH, Gundelfinger ED, Sheng M, Garner CC. and Budnik V. (1997). Synaptic clustering of the cell adhesion molecule fasciclin2 by discs large and its role in the regulation of presynaptic structure. **Neuron** 19, 787-799.
20. Naisbitt S, **Kim E**, Weinberg RJ, Rao A, Yang FC, Craig AM and Sheng M. (1997). Characterization of guanylate kinase-associated protein, a postsynaptic density protein at excitatory synapses that interacts directly with PSD-95/SAP90. **J Neurosci** 17, 5687-5696.
19. Hsueh YP, **Kim E** and Sheng M. (1997). Disulfide-linked head-to-head multimerization in the mechanism of ion channel clustering by PSD-95. **Neuron** 18, 803-814.
18. **Kim E**, Naisbitt S, Hsueh YP, Rao A, Rothschild A, Craig AM and Sheng M. (1997). GKAP, a novel synaptic protein that interacts with the guanylate kinase-like domain of the PSD-95/SAP90 family of channel clustering molecules. **J Cell Biol** 136, 669-678.
17. Tejedor F, Bokhari A, Rogero O, Gorczyca M, **Kim E**, Sheng M and Budnik V. (1997). Essential role for dlg in synaptic clustering of Shaker channels in vivo. **J Neurosci** 17, 152-159.
16. **Kim E** and Sheng M. (1996). Differential K⁺ channel clustering activity of PSD-95 and SAP-97, two related membrane-associated putative guanylate kinases. **Neuropharmacol** 35, 993-1000.
15. **Kim E**, Cho KO, Rothschild A and Sheng M. (1996). Heteromultimerization and NMDA receptor clustering activity of chapsyn-110, a member of the PSD-95 family of synaptic proteins. **Neuron** 17, 103-113.
14. Sheng M. and **Kim E**. (1996). Ion channel associated proteins. **Curr Opin Neurobiol** 6, 602-608.
13. Doyle D, Lee A, Lewis J, **Kim E**, Sheng M and MacKinnon R. (1996). Crystal structure of a complexed and peptide-free membrane protein tethering domain: molecular basis of peptide recognition by PDZ. **Cell** 85, 1067-1076.
12. Niethammer M, **Kim E** and Sheng M. (1996). Interaction between the C-terminus of NMDA receptor subunits and multiple members of the PSD-95 family of membrane associated guanylate kinases. **J Neurosci** 16, 2157-2163.
11. **Kim E**, Niethammer M, Rothschild A, Jan YN and Sheng M. (1995). Clustering of Shaker-type K⁺ channels by interaction with a family of membrane-associated guanylate kinases. **Nature** 378, 85-88.

10. **Kim E**, Day TA, Bennett JI and Pax RA. (1995). Immunological localization of a Shaker-related voltage-gated potassium channel in *Schistosoma mansoni*. **Exp Parasitol** 81, 421-429.
9. **Kim E**, Day TA, Bennett JI and Pax RA. (1995). Cloning and functional expression of a Shaker-related voltage-gated potassium channel gene from the flatworm *Schistosoma mansoni*. **Parasitol** 110, 171-180.
8. Day TA, **Kim E**, Bennett JL and Pax RA. (1995). Analysis of kinetics and voltage-dependency of transient and delayed K⁺ currents in muscle fibers isolated from the flatworm *Schistosoma mansoni*. **Comp Biochem Physiol** 111, 79-87.
7. Park YH, Suzuki KI, Yim DG, Lee KC, **Kim E**, Yoon JS, Kim SJ, Kho YH, Goodfellow M. and Komagata K. (1994). Suprageneric classification of peptidoglycan group B actinomycetes by nucleotide sequencing of 5S ribosomal RNA. **Antonie van Leeuwenhoek** 64, 3-4.
6. **Kim E**, Kim H, Hong SP, Kang KH, Kho YH and Park YH. (1993). Gene organization and primary structure of a ribosomal RNA gene cluster from *Streptomyces griseus* subsp. *griseus*. **Gene** 132, 21-31.
5. Eaton MJ, Gopalan C, **Kim E**, Lookingland KJ and Moore KE. (1993). Comparison of the effects of the dopamine D2 agonist quinlorane on the tuberoinfundibular dopaminergic neuronal activity in male and female rats. **Brain Res** 629, 53-58.
4. Park YH, **Kim E**, Yim DG, Kho YH, Mheen TI and Goodfellow M. (1993). Suprageneric classification of *Thermoactinomyces vulgaris* by nucleotide sequencing of 5S ribosomal RNA. **Zbl Bakt** 278, 469-478.
3. Park YH, Yim DG, **Kim E**, Kho YH, Mheen TI, Lonsdale J and Goodfellow M. (1991). Classification of acidophilic, neutrotolerant and neutrophilic streptomycetes by nucleotide sequencing of 5S ribosomal RNA. **J Gen Microbiol** 137, 2265-2269.
2. **Kim E**, Kim H, Kang KH, Kho YH and Park YH. (1991). Complete nucleotide sequence of a 16S ribosomal RNA gene from *Streptomyces griseus* subsp. *griseus*. **Nucleic Acids Res** 11, 1149.
1. **Kim E**, Pack MY and Yoon KH. (1989). Isolation and characterization of *Zymomonas mobilis* DNA fragments showing promoter activities in *Escherichia coli*. **Kor J Appl Microbiol Bioeng** 17, 600-605.

Invited presentations (selected)

40. Workshop on "Synapse formation, specification, and elimination: from molecules to circuits". Baeza, Spain. Sept 24th-27th, 2017.
39. Symposium on "Synaptic actin dysregulation, a convergent mechanism of mental disorders", Society for Neuroscience, San Diego, USA. Nov 12-16, 2016.
38. The 47th NIPS International Symposium entitled "Decoding Synapses", National Institute for Physiological Sciences (NIPS), Okazaki, Japan. Oct 26-28, 2016.
37. The 10th FENS Forum of Neuroscience, Copenhagen, Denmark, July 2-6, 2016.
36. Gordon Research Conference on "Cell Biology of the Neuron". Waterville Valley Resort in New Hampshire, USA. June 26-July 1, 2016.
35. 94th General session and exhibition of the International Association for Dental Research, Seoul, Korea. June 22-24, 2016. Distinguished Lecture.

34. The 4th International Symposium on Neurotransmission and Synaptic Plasticity, Nanchang, China. April 20-22, 2016.
33. Asia Pacific Regional IMFAR Shanghai. Shanghai, Nov 6-8, 2015.
32. The 38th Annual Meeting of the Japanese Neuroscience Society, Kobe, July 28-31, 2015.
31. The 37th Annual Meeting of the Molecular Biology Society of Japan, Yokohama, Nov 25-27, 2014.
30. 4th LIN Symposium on "Synaptic Function and Synaptic Pathology in Disease", Tangermünde, Aug 25-28, 2014.
29. Cold Spring Harbor Asia Conference on "Neural Circuit Basis of Behavior and its Disorders", Suzhou, China, May 12-16, 2014.
28. Royal Society Satellite Meeting on "Long-term potentiation: enhancing neuroscience for 40 years", London, UK, Dec. 4-5, 2013.
27. FENS Conference on "The Neurobiology of Synapses and their Dysfunction", Stresa, Italy, Oct 13-17, 2013.
26. The Annual Meeting of The Japanese Biochemical Society Symposium on "Mechanism of expression of synaptic function and onset of neurodegenerative disease by retardation of the function", Yokohama, Japan, Sept. 11-13, 2013.
25. International Union of Physiological Sciences (IUPS), Birmingham, UK, July 21-26, 2013.
24. RIKEN BSI Summer Program 2013 "Neural circuits from top to bottom", Saitama, Japan, July 2-10, 2013.
23. International Society for Neurochemistry (ISN) Satellite Meeting on "Synapse Biology and Disease", Riviera Maya, Mexico, Apr. 25-28, 2013.
22. Synapse Symposium in Academia Sinica, Taipei, Taiwan, Dec. 3-4, 2012.
21. Gordon Research Conference on 'Molecular & Cellular Neurobiology', Hong Kong, June 17-22, 2012.
20. The 89th Annual Meeting of the Physiological Society of Japan. Matumoto, Nagano, Japan, Mar. 29-31, 2012.
19. The Japanese Neuroscience Society Meeting symposium on "Emerging synapse organizers in hippocampal neural circuits", Yokohama, Japan, Sept. 14-17, 2011.
18. International Society for Neurochemistry (ISN) Satellite Symposium on 'The Synapse: from Physiology to Pathology', Varenna, Italy, Sept. 4-7, 2011.
17. Gordon Research Conference on 'Excitatory Synapses and Brain Function', New London, NH, USA, June 26-July 1, 2011.
16. Cold Spring Harbor Laboratory Symposium on 'Synapses: From Molecules to Circuits and Behavior', Cold Spring Harbor, NY, USA, Apr. 12-16, 2011.
15. The 88th Annual Meeting of the Physiological Society of Japan and the 116th Annual meeting of the Japanese Association of Anatomists, Yokohama, Japan, Mar. 28-30, 2011.
14. Magdeburg International Neurobiological Symposium on 'Learning and Memory', Magdeburg, Germany, Sept. 4-8, 2010, 2010.
13. International College of Neuro-Psychopharmacology (CINP) World Congress. Hong Kong, June 6-10, 2010.

12. The 8th Biennial Conference of the Chinese Society for Neuroscience, Guangzhou, China (Plenary Lecture), 2009.
11. Federation of European Neuroscience Societies (FENS) Satellite Symposium on 'Cell-cell Adhesion Mechanisms', Villars, Switzerland, 2008.
10. Gordon Research Conference on 'Cell Biology of the Neuron', New London, NH, USA. 2008.
9. Gordon Research Conference on 'Molecular and Cellular Neurobiology', Hong Kong. 2008.
8. Westerburg Symposium on 'Molecular Dynamics of the Chemical Synapse', Westerburg, Germany, 2007.
7. IBRO World Congress of Neuroscience, Melbourne, Australia. 2007.
6. The 4th Congress of Federation of Asian-Oceanian Neuroscience Societies (FAONS), Hong Kong (Plenary Lecture), 2006.
5. The 7th Biennial Meeting of the Asia-Pacific Society for Neurochemistry (APSN 2006), Singapore, 2006.
4. Cold Spring Harbor Laboratory Symposium on 'Channels, Receptors & Synapses', Cold Spring Harbor, NY, USA, 2006.
3. Gordon Research Conference on 'Excitatory Amino Acids & Brain Function' Centre Paul Langevin, Aussois, France, 2005.
2. The 1st Leibniz Conference on 'Spinogenesis and Synaptic Plasticity', Westerburg, Germany, 2004.
1. The 6th Biennial Meeting of the Asia-Pacific Society for Neurochemistry (APSN), Hong Kong, 2004.