Curriculum Vitae

Qiang Chang

A. Citizenship: U.S.A.

B. Office address: University of Wisconsin-Madison, 657 Waisman Center
1500 Highland Avenue, Madison, WI 53705

C. Education:

08/94-06/00, University of Pennsylvania School of Medicine, Neuroscience Graduate Group, Ph.D., August, 2000.

Ph.D. thesis title: The Role of Gap Junctional Coupling in Motor Neuron and Neuromuscular Junction Development

10/89-07/94, Peking University, Department of Biology, B.S. in Biochemistry and Molecular Biology, Beijing, P.R. China.

D. Research Experience:

1993-1994	B.S. candidate in Protein Engineering Lab at Peking University
1994-1996	Ph.D candidate in Department of Neurosciences at the University of Pennsylvania School of Medicine
1996-2000	Ph.D candidate, Laboratory of Dr. Rita Balice-Gordon, Department of Neuroscience, University of Pennsylvania School of Medicine
2000-2001	Research Fellow, Laboratory of Dr. Zhigang He, Children's Hospital of Boston/Harvard Medical School
2001-2007	Postdoctoral Fellow, Laboratory of Dr. Rudolf Jaenisch, Whitehead Institute for Biomedical Research

E. Academic Positions:

2007- 2013	Assistant Professor, Departments of Medical Genetics and Neurology, University of Wisconsin-Madison
2008-2016	Co-Director, Rodent Models Core, Waisman Center
2013-	Associate Professor with tenure, Departments of Medical Genetics and Neurology, University of Wisconsin-Madison
2013-	Associate Director, The Waisman Intellectual and Developmental Disabilities Research Center (Waisman IDDRC)
2016-	Co-Director, IDD Models Core, Waisman Center IDDRC

F. Honors and Awards:

1991	Guang Hua Schorlarship
1992	Guang Hua Schorlarship
1994	Outstanding Thesis

1996-1998 Dean's Fellowship
2001 Saul Winegrad Award for outstanding thesis
2005-2006 Postdoctoral Fellowship (Rett Syndrome Research Foundation)
2008-2010 NARSAD Young Investigator Award
2013-2014 Vilas Mid-Career Investigator Award
2013-2014 Vilas Research Investigator Award
2013-2015 Vilas Associate Professor

G. Contributions to Science

1. I made significant contribution to our understanding of the role of neurotrophic and growth factors in Rett syndrome (RTT), a devastating neurodevelopmental disorder caused by mutations in the X-linked methyl-CpG binding protein 2 (MECP2) gene. Since MeCP2 was know to regulate gene transcription, much of the early research in the RTT filed focused on identifying MeCP2 target genes and understanding the functional relevance of these genes in RTT disease progression. During my postdoctoral training in the laboratory of Dr. Rudolf Jaenisch, I initiated collaboration with the laboratory of Dr. Michael Greenberg to identify brain-derived neurotrophic factor (*Bdnf*) as the first MeCP2 target gene. Our paper (a) has been cited more than 1,000 times since publication. I followed up that initial finding by investigating the *in vivo* relevance of *Bdnf* to RTT in the mouse model. I showed that the BDNF protein level is reduced in the *Mecp2* mutant mice, and that while deletion of *Bdnf* in the *Mecp2* mutant brain exacerbated RTT-like symptoms, overexpression of *Bdnf* in the *Mecp2* mutant brain alleviated RTT-like symptoms. These findings not only establish the significant role of BDNF in modulating RTT disease progression in the mouse model, but also raise the possibility of the involvement of trophic and growth factors in general. My paper (b) describing these findings has been cited more than 390 times since publication. Encouraged by my early findings on the potential role of BDNF in regulating RTT disease progression, the Sur laboratory at MIT collaborated with the Jaenish laboratory to explore the therapeutic potential of other growth factors, which led to the discoveries that the IGF-1 tripeptide and the full-length IGF-1 protein could slow down disease progression in RTT mouse models, even before any deficit was found in IGF-1 level in these mice. Currently, there are two ongoing clinical trials in the United States on using either the full-length IGF-1 protein or the IGF-1 tripeptide to treat RTT patients. Because the therapeutic utility of BDNF is limited, I further pursued activation of BDNF signaling as a potential treatment for RTT. After establishing my independent research program at the University of Wisconsin-Madison, I directed research to investigate the therapeutic efficacy of 7,8-DHF, a small molecule ligand of the high affinity BDNF receptor, TrkB, in a RTT mouse model. Our results demonstrated that 7,8-DHF could alleviate certain symptoms in the RTT mouse model, suggesting modulation of BDNF signaling is a potential treatment strategy for RTT.

a. Chen, W.G., **Chang, Q.***, Lin, Y., Meissner, A., West, A.E., Griffith, E.C., Jaenisch, R., and Greenberg, M.E. (2003) Derepression of BDNF transcription involves calcium-dependent phosphorylation of MeCP2. Science 302:885-889.*

b. **Chang, Q.**, *Khare, G.D., Dani, V.S., Nelson, S.B., and Jaenisch, R. (2006) The disease progression of Mecp2 mutant mice is affected by the level of BDNF expression. Neuron 49(3):341-348.*

c. Johnson, R.A., Lam, M., Punzo, A.M., Li, H., Lin, B.R., Ye, K., Mitchell, G.S., and **Chang, Q.** *(2012) 7,8-dihydroxyflavone (7,8-DHF) exhibits therapeutic efficacy in a mouse model of Rett syndrome. Journal of Applied Physiology Epub 2011 Dec 22. PMCID: PMC3643819*

2. I made significant contribution to our understanding of the function of stimulus-induced phosphoryaltion of MeCP2. To fully understand the disease mechanism of RTT, it is essential to study all aspects of the molecular function of MeCP2. One fascinating aspect of MeCP2 function is that it can be phosphorylated in response to diverse extracellular stimuli. Insights into the regulation and function

of MeCP2 phosphorylation will help improve our understanding of how MeCP2 integrate environmental stimuli in the nuclei to generate adaptive responses and may eventually lead to treatments for patients. My laboratory at the University of Wisconsin-Madison created a *Mecp2* knockin mice that carry a phospho-dead mutation at a key phosphorylation site (serine 421, S421), and studied the functional consequence of loss of neuronal activity-induced S421 phosphorylation at the molecular, cellular, synaptic and behavioral levels. We showed that these phosphor-dead *Mecp2* mutant mice have altered MeCP2 occupancy at gene promoters, altered expression of genes with important neuronal functions, enhanced synaptogenesis, long-term potentiation and spatial memory. Our results provided the first genetic evidence that neuronal activity-induced MeCP2 phosphorylation in required in modulating dynamic functions in the adult mouse brain. Furthermore, we discovered that S421 phosphorylation is also required for the non-Hebbian form of synaptic plasticity called synaptic scaling. This finding directly links the nuclear function of MeCP2 with the regulation of surface level of neurotransmitter receptor across all synapses on a given neuron, and implicates MeCP2 in the constant tuning of neuronal network. Most recently, we discovered that S421 phosphorylation is also present in adult neural progenitor cells (aNPC) isolated from the adult hippocampus. This is the first time that MeCP2 phosphorylation has been observed in a cell type other than postmitotic neurons. Interestingly, the simulus, the regulation and the function of S421 phosphorylation in aNPC are completely different from those in post-mitotic neurons. In aNPCs, MeCP2 S421 phosphorylation is induced by growth factors, linked to cell cycle, directly regulated by aurora kinase B, and plays critical roles in regulating the proliferation and differentiation of aNPCs through the Notch signaling pathway. These new findings further generalize MeCP2 phosphorylation as a common regulatory module in cellular functions.

a. Li, H., Zhong, X., Chau, K.F., Williams, E.S., and **Chang, Q.** *(2011) Loss of Activity-Induced Phosphorylation of MeCP2 Enhances Synaptogenesis, LTP, and Spatial Memory. Nature Neuroscience 14(8):1001-8. PMCID: PMC3273496*

b. Zhong, X., Li, H., and **Chang, Q.** *(2012) MeCP2 phosphorylation is required for modulating synaptic scaling through mGluR5. Journal of Neuroscience, 32(37):12841-12847. PMCID: PMC3474205.*

c. Li, H., Zhong, X., Chau, K.F., Santistevan, N.J., Guo, W., Kong, G., Li, X., Kadakia, M., Masliah, J., Chi, J., Jin, P., Zhang, J., Zhao, X. and **Chang, Q.** *(2014) Cell cycle-linked MeCP2 phosphorylation modulates adult neurogenesis involving the Notch signaling pathway. Nature Communications, PMCID: PMC4288926*

3. I made significant contribution to establishing RTT patient-specific induced pluripotent stem cells (iPSCs) and neurons/astrocytes differentiated from RTT iPSCs as a *in vitro* platform for studying RTT disease mechanisms. My laboratory at the Univeristy of Wisconsin-Madison was among the first few groups to generate and characterize iPSC lines from RTT patients. We have generated pairs of congenic iPSC lines from the same female RTT patients that clonally express either the wild type copy or the mutant copy, but not both, of the *MECP2* gene. Because the wild type and mutant iPSC lines are derived from the same RTT patient, variations in phenotypic analysis due to different genetic background will be minimized. These unique tools will greatly increase the sensitivity and reliability of our assays. We have subsequently differentiated these RTT iPSC lines into different types of neurons and astrocytes, and characterized RTT-relevant phenotypes in various culturing conditions containing neurons, astrocytes, and both cell types. These *in vitro* experimental platforms are complementary to RTT mouse models in studying disease mechanisms, and have potential to be employed in future high throughput drug screens.

a. Ananiev, G., Williams, E.C., Li, H., and **Chang, Q.** *(2011) Isogenic Pairs of Wild Type and Mutant Induced Pluripotent Stem Cell (iPSC) Lines from Rett Syndrome Patients as In Vitro Disease Model. PloS ONE 6(9):e25255. Epub 2011 Sep 26. PMCID: PMC3180386*

b. Williams, E.C., Zhong, X., Mohamed, A., Li, R., Liu, Y., Dong, Q., Ananiev, G.E., Mok, J.C., Lin, B.R., Lu, J., Chiao, C., Cherney, R., Li, H., Zhang, S.C., and **Chang, Q***. (2014) Mutant astrocytes differentiated from Rett syndrome patients-specific iPSCs have adverse effects on wild-type neurons. Human Molecular Genetics, PMCID: PMC4014193*

c. Bu, Q., Wang, A., Hamzah, H., Waldman, A., Jiang, K., Dong, Q., Li, R., Kim, J., Turner, D., and ***Chang, Q.*** *(2017) CREB signaling is involved in Rett syndrome pathogenesis. Journal of Neuroscience, PMCID: PMC5373141*

4. I made significant contribution to the role of MeCP2 in regulating alternative splicing and its relevance to RTT. First, we identified RNA-independent physical interactions between MeCP2 and multiple splicing factors (including LEDGF and DHX9) under physiological conditions in the brain. Moreover, we revealed enriched MeCP2 occupancy at the exon/intron boundary in the brain, and showed co-occupany at alternatively spliced exons by MeCP2 and one of its interacting partners (e.g LEDGF) at a specific gene. Most importantly, we established a functional and causal link between alteration of a specific splicing event (flip/flop exon splicing in the AMPA receptor genes) and altered synaptic function in the RTT mouse brain. These findings not only significantly advance our understanding of the mechanism of RTT, but also reveal novel drug targets for developing treatment in the future. Splicing misregulation has been increasingly recognized as a significant contributor to a number of neurological diseases, such as SMA, FTDP-17, ALS and myotonic dystrophy. The mechanistic study of how the genes mutated in neurological diseases can directly affect alternative splicing, as well as the functional consequences of splicing alteration in such diseases, will have important implications in human health. Our study adds to the growing list of studies on the novel links between specific events of altered splicing and neurological diseases.

a. Li, R., Dong, Q., Yuan, X., Zeng, X., Gao, Y., Chiao, C., Li, H., Zhao, X., Keles, S., Wang, Z., and **Chang, Q.** *(2016) Misregulation of Alternative Splicing in a Mouse Model of Rett Syndrome. PLoS Genetics, PMCID: PMC4924826*

H. Peer-reviewed Publications (in chronological order):

1. Gonzalez, M., Ruggiero, F.P., **Chang, Q.**, Shi, Y.J., Rich, M.M., Kraner, S., and Balice-Gordon, R.J. (1999) Disruption of trkB-mediated signaling induces disassembly of postsynaptic receptor clusters at neuromuscular junction. ***Neuron*** 24: 567-583.

2. **Chang, Q.**, Gonzalez, M., Pinter, M.J., and Balice-Gordon, R.J. (1999) Gap junctional coupling and patterns of connexin expression among neonatal rat lumbar spinal motor neurons. ***Journal of Neuroscience*** 19(24): 10813-10828.

3. **Chang, Q.**, Pereda, A., Pinter, M.J., and Balice-Gordon, R.J. (2000) Nerve injury induces gap junctional coupling among axotomized adult motor neurons. ***Journal of Neuroscience*** 20(2): 674-684.

4. Chen, W.G., **Chang, Q.**, Lin, Y., Meissner, A., West, A.E., Griffith, E.C., Jaenisch, R., and Greenberg, M.E. (2003) Derepression of BDNF transcription involves calcium-dependent phosphorylation of MeCP2. ***Science*** 302:885-889.

5. Dani, V.S.*, **Chang, Q.***, Maffei, A., Turrigiano, G.G., Jaenisch, R., and Nelson, S.B. (2005) Reduced cortical activity due to a shift in the balance between excitation and inhibition in a mouse model of Rett Syndrome. ***PNAS*** 102(35):12560-12565. (* Equal contribution)

6. **Chang, Q.**, Khare, G.D., Dani, V.S., Nelson, S.B., and Jaenisch, R. (2006) The disease progression of *Mecp2* mutant mice is affected by the level of BDNF expression. ***Neuron*** 49(3):341-348.

7. Personius, K.E., **Chang, Q.,** Mentis, G.Z., O'Donovan, M.J., and Balice-Gordon, R.J. (2007) Reduced gap junctional coupling leads to uncorrelated motor neuron firing and precocious neuromuscular synapse elimination. ***PNAS*** 104(28): 11808-11813.

8. Tao, J*, Hu K*, **Chang, Q.***, Wu, H., Sherman, N.E., Martinowich K., Klose, R.J., Schanen, C., Jaenisch, R., Wang, W., and Sun, Y.E. (2009) Phosphorylation of MeCP2 at serine 80 regulates its chromatin association and neurological function. ***PNAS*** 106(12):4882-7. (* Equal contribution) PMCID: PMC2660725

9. Jang, S.W., Liu, X., Pradoldej, S., Tosini, G., **Chang, Q.,** Iuvone, P.M., and Ye, K. (2010) N-acetylserotonin activates TrkB receptor in a circadian rhythm. ***PNAS*** 107(8):3876-81. PMCID: PMC2840510

10. Jang, S.W., Liu X, Chan, C.B., France, S.A., Sayeed, I., Tang, W., Lin, X., Xiao, G., Andero, R., **Chang, Q.,** Ressler, K.J., and Ye, K. (2010) Deoxygedunin, a natural product with potent neurotrophic activity in mice. ***PloS One*** 5(7):e11528. PMCID: PMC2903477

11. Wang, J., Liu, Y., Li, Z., Wang, Z., Tan, L.X., Ryu, M-J., Meline, B., Du, J., Young, K.H., Ranheim, E., **Chang, Q.,** and Zhang, J. (2011) Endogenous oncogenic Nras Mutation Initiates Hematopoietic Malignancies in a Dose- and Cell Type-Dependent Manner. ***Blood*** 118(2):368-79. PMCID:PMC3138689

12. Li, H., Zhong, X., Chau, K.F., Williams, E.S., and **Chang, Q.** (2011) Loss of Activity-Induced Phosphorylation of MeCP2 Enhances Synaptogenesis, LTP, and Spatial Memory. ***Nature Neuroscience*** 14(8):1001-8. PMCID: PMC3273496

13. Ananiev, G., Williams, E.C., Li, H., and **Chang, Q.** (2011) Isogenic Pairs of Wild Type and Mutant Induced Pluripotent Stem Cell (iPSC) Lines from Rett Syndrome Patients as *In Vitro* Disease Model. ***PloS ONE*** 6(9):e25255. Epub 2011 Sep 26. PMCID: PMC3180386

14. Szulwach, K., Li, X., Li, Y., Song, C., Wu, H., Dai, Q., Irier, H., Upadhyay, A., Gearing, M., Levey, A., Vasanthakumar, A., Godley, L., **Chang, Q.,** Cheng, X., He, C., and Jin, P. (2011) 5-Hydroxymethylcytosine-mediated Epigenetic Dynamics during Postnatal Neurodevelopment and Aging. ***Nature Neuroscience*** 14(12):1607-16. PMCID:PMC3292193

15. Johnson, R.A., Lam, M., Punzo, A.M., Li, H., Lin, B.R., Ye, K., Mitchell, G.S., and **Chang, Q.** (2012) 7,8-dihydroxyflavone (7,8-DHF) exhibits therapeutic efficacy in a mouse model of Rett syndrome. ***Journal of Applied Physiology*** 112(5):704-10. PMCID: PMC3643819

16. Ryu, M.-J., Liu, Y., Zhong, X., Du, J., Peterson, N., Kong, G., Li, H., Wang, J., Salamat, S., **Chang, Q.**, and Zhang, J. (2012) Oncogenic Kras expression in postmitotic neurons leads to S100A8-S100A9 overexpression and gliosis. ***Journal of Biological Chemistry*** 287(27): 22948-22958. PMCID:PMC3391097

17. Zhong, X., Li, H., and **Chang, Q.** (2012) MeCP2 phosphorylation is required for modulating synaptic scaling through mGluR5. ***Journal of Neuroscience*** 32(37): 12841-12847. PMC3474205.

18. Zeng, X., Sanalkumar, R., Bresnick, E.H., Li, H., **Chang, Q.,** and Keles, S. (2013) jMOSAiCS: joint analysis of multiple ChIP-seq datasets. ***Genome Biology***, PMCID: PMC4053760

19. Wang, T., Wu, H., Li, Y., Szulwach, K.E., Lin, L., Li, X., Chen, I.P., Goldlust, I.S., Chamberlain, S.J., Dodd, A., Gong, H., Ananiev, G., Han, J.W., Yoon, Y.S., Katharine, R.M., Yu, M., Song, C.X., He, C., **Chang, Q.,** Warren, S.T., Jin, P. (2013) Subtelomeric hotspots of aberrant 5-hydroxymethylcytosine-mediated epigenetic modifications during reprogramming to pluripotency. ***Nature Cell Biology*** 15(6):700-711. PMCID: PMC3998089

20. Guo, J.U., Su, Y., Shin, J.H., Xie, B., Zhong, C., Hu, S., Le, T., Fan, G., Zhu, H., **Chang, Q.,** Gao, Y., Ming, G.L., and Song, H. (2014) Distribution, recognition and regulation of non-CpG methylation in the adult mammalian brain. ***Nature Neuroscience***, PMCID: PMC3970219

21. Williams, E.C., Zhong, X., Mohamed, A., Li, R., Liu, Y., Dong, Q., Ananiev, G.E., Mok, J.C., Lin, B.R., Lu, J., Chiao, C., Cherney, R., Li, H., Zhang, S.C., and **Chang, Q.** (2014) Mutant astrocytes differentiated from Rett syndrome patients-specific iPSCs have adverse effects on wild-type neurons. ***Human Molecular Genetics***, PMCID: PMC4014193

22. Musah, S., Wrighton, P.J., Zaltsman, Y., Zhong, X., Zorn, S., Parlato, M.B., Hsiao, C., Palecek, S.P., **Chang, Q.,** Murphy, W.L. and Kiessling, L.L. (2014) Substratum-induced differentiation of human pluripotent stem cells reveals YAP as a potent regulator of neuronal specification. ***PNAS***, PMCID: PMC4183276

23. Cell cycle-linked MeCP2 phosphorylation modulates adult neurogenesis involving the Notch signaling pathway. Li, H., Zhong, X., Chau, K.F., Santistevan, N.J., Guo, W., Kong, G., Li, X., Kadakia, M., Masliah, J., Chi, J., Jin, P., Zhang, J., Zhao, X. and **Chang, Q.** (2014) ***Nature Communications***, PMCID: PMC4288926

24. Gao, Y., Su, J., Guo, W., Polich, E.D., Magyar, D.P., Xing, Y., Li, H., Smrt, R.D., **Chang, Q.,** and Zhao, X. (2015) Inhibition of miR-15a rescues neuronal maturation deficits in MeCP2 mutant neurons by elevating BDNF levels. ***Stem Cells***, PMCID: PMC4409556

25. Delepine, C., Meziane, H., Nectous, J., Opitz, M., Smith, A.B., Ballatore, C., Saillour, Y., Bennaceur-Griscelli, A., **Chang, Q.,** Williams, E.C., Dahan, M., Duboin, A., Billuart, P., Herault, Y., Bienvenu, T. (2016) Altered microtubule dynamics and vesicular transport in mouse and human MeCP2-deficient astrocytes. ***Human Molecular Genetics***, PMCID: PMC4690499

26. Li, R., Dong, Q., Yuan, X., Zeng, X., Gao, Y., Chiao, C., Li, H., Zhao, X., Keles, S., Wang, Z., and **Chang, Q.** (2016) Misregulation of Alternative Splicing in a Mouse Model of Rett Syndrome. ***PLoS Genetics***, PMCID: PMC4924826

27. Bu, Q., Wang, A., Hamzah, H., Waldman, A., Jiang, K., Dong, Q., Li, R., Kim, J., Turner, D., and **Chang, Q.** (2017) CREB signaling is involved in Rett syndrome pathogenesis. ***Journal of Neuroscience***, PMCID: PMC5373141

28. Lim, C.S., Kang, X., Mirabella, V., Zhang, H., Bu, Q., Araki, Y., Hoang, E.T., Wang, S., Shen, Y., Choi, S., Kaang, B.K., **Chang, Q.,** Pang, Z.P., Huganir, R.L., and Zhu, J.J. (2017) BRaf signaling principles unveiled by large-scale human mutation analysis with a rapid lentivirus-based gene replacement method. ***Genes & Development***, PMCID: PMC5393050

I. Reviews and Book Chapters:

1. **Chang, Q.,** Pereda, A., Pinter, M.J. and Balice-Gordon, R.J. (1997) Functional role of gap junctions in nerve-muscle maintenance. In: ***Gap Junctions***. Werner, R., ed., IOS, pp. 188-192.

2. **Chang, Q.** and Balice-Gordon, R.J. (1997) Nip and tuck at the neuromuscular junction: A role for proteases in developmental synapse elimination. ***BioEssays*** Vol. 19, No. 4, 273-275.

3. **Chang, Q.** and Balice-Gordon, R.J. (2000) Gap junctional communication among developing and injured motor neurons. ***Brain Research Reviews*** 32(1):242-249.

4. **Chang, Q.** and Balice-Gordon, R.J. (2000) Highwire, rpm-1 and futsch: Balancing synaptic growth and stability. ***Neuron*** 26: 287-290.

5. Personius, K., **Chang, Q.**, Bittman, K., Panzer, J. and Balice-Gordon, R. (2001) Gap junctional communication among motor and other neurons shapes patterns of neural activity and synaptic connectivity during development. ***Cell Commun Adhes***. 8(4-6):329-33.

6. Li, H. and **Chang, Q.** (2014) Regulation and function of stimulus-induced phosphorylation of MeCP2. ***Frontiers in Biology***, PMCID: PMC4283599

7. Kimble, J., Bement, W.M., **Chang, Q.,** Cox, B.L., Drinkwater, N.R., Gourse, R.L., Hoskins, A.A., Huttenlocher, A., Kreeger, P.K., Lambert, P.F., Mailick, M.R., Miyamoto, S., Moss, R.L., O'Connor-Giles, K.M., Roopra, A., Saha, K., and Seidel, H.S. (2015) Strategies from UW-Madison for rescuing biomedical research in the US. ***eLife***, PMCID: PMC4484056

J. Research Support:

Active

2R01HD064743-06A1 (Chang, PI) 07/01/17-08/31/22 3 calendar
NICHD/NIH
Function of Stimulus-Induced MeCP2 phosphorylation
The major goal of this project is to reveal the combinatorial code of stimulus-induced MeCP2 phosphorylation and study its function in the nervous system.

R56NS100024-01A1 (Chang, PI) 07/15/17-06/30/18 3 calendar
Astrocyte dysfunction in Rett syndrome
The major goal of this project is to study the contribution of astrocyte to disease pathogenesis in Rett syndrome.

R03 HD086523 (Chang, PI) 01/15/16-12/31/17 0.6 calendar
NIH/NICHD
Sterol metabolism in Rett syndrome
The major goal of this project is to explore the potential role of sterol metabolism in RTT pathogenesis, which may advance our understanding of the disease mechanism and help developing treatments.

3501 06/01/17-05/31/19 0.12 calendar
International Rett Syndrome Foundation (Chang, PI)
In vitro and in vivo validation of candidate drugs for treating Rett syndrome
The major goal of this project is to test the efficacy of candidate drugs in human stem cell and mouse models of Rett syndrome.

U54 HD090256 (Messing, PI) 09/01/16-08/31/21 1.2 calendar
NIH/NICHD
The Waisman Intellectual and Developmental Disabilities Research Center (Waisman IDDRC)

This project provides core support for 95 research projects conducted by investigators pursuing research on intellectual and developmental disabilities at the Waisman Center. The Cores include: Administration, Clinical Translation, Rodent Models, Cellular and Molecular Neurosciences, and Brain Imaging. Chang is the associate director of the Waisman IDDRC.

R56MH113146 (Zhao, PI; Chang, co-PI) 08/03/17-07/31/18 0.6 calendar
NIH/NIMH
Epigenetic crosstalk regulates neuronal development
The major goal of this project is to how methyl-CpG binding proteins regulate gene expression during postnatal brain development.

Completed
(Chang, PI) 07/01/08-06/30/10
National Alliance for Researach on Schizophrenia and Depression (NARSAD)
Studying the Molecular Mechanism of Rett Syndrome

(Chang, PI) 10/01/08-09/30/10
International Rett Syndrome Foundation #0805
Evaluating the therapeutic potential of small compound mediated activation of BDNF signaling through TrkB in a mouse model of Rett Syndrome

(Chang, PI) 08/25/10-07/31/12
NICHD/NIH 1R21HD066560
Experience-Dependent Redeployment of MeCP2 Across the Mouse Genome

(Chang, PI) 10/01/11-09/30/12
International Rett Syndrome Foundation #2801
Establishing Neurons Differentiated from an Isogenic Pair of Rett Syndrome iPSC lines as Cell-Based Assay for Future Drug Screens

(Chang, PI) 09/01/12-08/31/14
NINDS/NIH 1R21 NS081484
Studying the glial contribution to RTT pathogenesis using patient-specific iPSCs

(Chang, PI)
NICHD/NIH 1R01HD064743 04/01/10-03/31/16
In Vivo Function of Neuronal Activity Induced MeCP2 Phosphorylation

(Zhao, PI; Chang, co-PI) 09/15/15-08/31/17
NIH/NINDS 1R21NS095632
Coordinate actions between methyl-CpG binding proteins in neuronal development

K. Invited Lectures:
Local
1. April 2008, Respiratory Physiology Seminar Series, UW-Madison.

2. February 2009, Genetics Colloquium, Laboratory of Genetics, UW-Madison.

3. April 2011, Grand Round, Department of Neurology, UW-Madison.

4. October 2011, Chromatin Group Seminar Series, UW-Madison.

5, October 2012, Department of Neuroscience, UW-Madison.

6. February 2013, Stem Cell and Regenerative Medicine Center, UW-Madison

7. April 2013, Department of Cell and Regenerative Biology, UW-Madison

8. November 2014, Transcription and Epigenetics Focus Group, UW-Madison

9. September 2015, Research Day, Department of Neurology, UW-Madison

10. January 2017, Department of Neuroscience, UW-Madison

11. February 2017, Grand Round, Department of Pediatrics, UW-Madison

12. January 2018, Grand Round, Department of Neurology, UW-Madison

National

1. May 2010, Emory University, Atlanta, GA.

2. May 2011, International Neural Transplantation and Repair Annual Meeting, Clearwater, FL.

3. June 2011, International Rett Syndrome Foundation Annual Meeting, Leesburg, VA.

4. October 2011, Chicago Memorial Hospital/Northwestern University, Chicago, IL.

5. February 2012, State University of New York-Stony Brook, Stony Brook, NY.

6. June 2012, 7th World Congress on Rett Syndrome, New Orleans, LA.

7. February 2013, University of Alabama at Birmingham, Birmingham, AL.

8, February 2013, Penn State College of Medicine, Hershey, PA.

9. March 2013, Interdisciplinary Training Conference in Developmental Disabilities, Chicago, IL.

10. October 2015, Luigs & Neumann International Symposium on Neural Circuits, University of Virginia School of Medicine, Charlottesville, VA.

11. September 2016, Life Science Institute, University of Michigan, Ann Arbor, MI.

International

1. July 2011, 13th Annual Meeting of the Society of Chinese Bioscientists in America, Guangzhou, China.

2. July 2011, Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences, Beijing, China.

3. July 2011, College of Animal Sciences, Zhijiang Univeristy, Hangzhou, China.

4. March 2012, Stem Cell Research Center, Tongji University, Shanghai, China.

5. March 2012, 2nd Military Medical University, Shanghai, China.

6. April 2012, International Graduate School of Neuroscience, Ruhr University, Bochum, Germany.

7. May 2014, Shanghai Jiaotong University, Shanghai, China.

8. Auguest, 2015, Guangzhou Institutes of Biomedicine and Health, Chinese Academy of Sciences, Guangzhou, China.

9. July 2016, Society of Chinese Neuroscientist World-Wide Meeting, Hefei, China.

10. July 2016, Chinese Biological Investigator Society 11th Biennial Meeting, Chengdu, China.

L. Teaching:
Genetics 466 (2010, 2012, 2014, 2016)

Med Genetics 707 (2011, 2013, 2015, 2017)

Genetics 565 (guest lecture in 2008 and 2009)

Neuroscience 500 (guest lecture in 2010 and 2011)

Epigenetics 375 (guest lecture in 2014, 2016, 2017)

M. Service:
Inside University of Wisconsin-Madison:
Admission Committee, Genetics Training Program (2007-2013)

Preliminary Exam Committee, Genetics Training Program (2016-present)

IDDRC Executive Committee, Waisman Center (2008-present)

Human Genomics Task Force, SMPH (2016)

Junior Faculty Mentoring Committee (Xuehua Zhong) (2016-present)

Partnership Education and Research Committee (PERC) review panel (2017-2019)

Search Committee for the Associate Director of Waisman Center, 2013

Search Committee for the Associate Director of UCEDD at UW-Madison, 2014

Search Committee for the Director of Waisman Center, 2015

Search Committee for the Associate Vice Chancellor for Biological Sciences at UW-Madison, 2015

Faculty Search Committee (multiple)

Outside of University of Wisconsin-Madison:
Regular member of NIH NCF study section (July 2017-June 2021)

Ad Hoc grant reviewer for NIH (NDPR, CNNT, MDNC, MDCN, eDC-UDP), CIRM, European Science Foundation, Wellcome Trust, Italian Telethon Foundation, Israel Science Foundation, Autism Speaks, Rettsyndrome.org, NYSTEM, ICTR

Journal reviewer for Nature, Nature Neuroscience, Nature Communication, Cell Reports, PLoS Genetics, PNAS, Human Molecular Genetics, Journal of Neuroscience, Molecular and Cellular Neuroscience, Glia, Stem Cells, eLife, Neuropsychopharmacology, Molecular Autism, Journal of Molecular Medicine, and etc.

Faculty promotion reviewer for UC-Davis, Shanghai Jiao Tong University.

N. Current Trainees:
Postdoctoral Trainee:
Qiping Dong, Ph.D.

Undergraduate Trainee:
Jared Akers, Genetics Major, University of Wisconsin-Madison, Class of 2017

Bin Hai, Biochemistry Major, University of Wisconsin-Madison, Class of 2018

Jason Kim, Biochemistry Major, University of Wisconsin-Madison, Class of 2018

Lexie Korndorf, Chemistry Major, University of Wisconsin-Madison, Class of 2018

Andrea Edwards, Biology Major, University of Wisconsin-Madison, Class of 2019

Greta Brown, Neurobiology Major, University of Wisconsin-Madison, Class of 2020

Siyang Song, Biochemistry Major, University of Wisconsin-Madison, Class of 2020

O. Past Trainees:
Postdoc Trainee:
Gene E. Ananiev, Ph.D. Currently manager of the Small Molecule Screening Facility at UWCCC.

Qian Bu, Ph.D. Currently Associate Professor at Sichuan University, China

Yan Liu, Ph.D. Currently postdoctoral fellow at UC-Berkeley

Anxin Wang, Ph.D. Currently scientist at HopStem, Inc., China

Xiaofen Zhong, Ph.D. Currently Investigator at Guangzhou Institutes of Biomedicine and Health, Chinese Academy of Sciences

Ph.D. Trainee:
Hongda Li, Genetics Training Program, University of Wisconsin-Madison, awarded the SCRMC predoctoral fellowship in 2009, awarded the Wisconsin Distinguished Graduate Fellowship in 2012, won the Schlimgen Award in 2012, Ph.D. awarded in 2013. Currently postdoctoral fellow at the Rockefeller University with a postdoctoral fellowship from the New York Stem Cell Foundation.

Emily Cunningham, Genetics Training Program, University of Wisconsin-Madison, awarded the Wisconsin Distinguished Graduate Fellowship in 2010, Ph.D. awarded in 2013

Ronghui Li, Cell and Molecular Biology Training Program, University of Wisconsin-Madison, awarded the SCRMC predoctoral fellowship in 2013, Ph.D. awarded in 2016. Currently postdoctoral fellow at the Salk Institute.

Undergraduate Trainee:
Sasha Cai Lesher-Perez, Engineering Major, University of Wisconsin-Madison, Class of 2009

Maxine Lam, Genetics Major, University of Wisconsin-Madison, Class of 2010

Emily McNally, University of Wisconsin-Madison, Class of 2010

Jessica Suzanne Lien, Biology Major, University of Wisconsin-Madison, Class of 2011

Richard Anthony Ferraro, Biology Major with Neurobiology option, University of Wisconsin-Madison, Class of 2012

Jonathan Chern Choong Mok, Genetics Major, University of Wisconsin-Madison, Class of 2012

Juliet Namalwa, University of Wisconsin-Madison, Class of 2012

Justin Willaim Riederer, Biology Major with Neurobiology option, University of Wisconsin-Madison, Class of 2013

Samantha Aaronson, Genetics Major, University of Wisconsin-Madison, Class of 2014

Jingyi Chi, Biology and Psychology Majors, University of Wisconsin-Madison, Class of 2014

Cassandra Chiao, Biology Major with Neurobiology option, University of Wisconsin-Madison, Class of 2014

Mitul Kadakia, University of Wisconsin-Madison Class of 2014

DongHo Kim, University of Wisconsin-Madison, Class of 2014

Ben Lin, University of Wisconsin-Madison, Class of 2014, awarded the Hilldale Undergraduate/Faculty Research Fellowship in 2012

Jamie Masliah, Genetics Major, University of Wisconsin-Madison, Class of 2014

Ahmed Mohamed, University of Wisconsin-Madison, Class of 2014

Rachel Campagna, Genetics Major, University of Wisconsin-Madison, Class of 2015

Rachel Cherney, Genetics Major, University of Wisconsin-Madison, Class of 2015

Tia Ramirez, University of Wisconsin-Madison, Class of 2015

Daniel Turner, Biochemistry and Genetics Majors, University of Wisconsin-Madison, Class of 2015

Elizabeth Howie, Genetics Major, University of Wisconsin-Madison, Class of 2016

Hamdi Manzah, University of Wisconsin-Madison, Class of 2016

Sherkhan Sauyrtayev, University of Wisconsin-Madison, Class of 2016

Alex Waldman, University of Wisconsin-Madison, Class of 2016

Xi Yu, Biology Major, University of Wisconsin-Madison, Class of 2016

Nicholas Munce, Genetics Major, University of Wisconsin-Madison, Class of 2017

Nicholas Clement, Genetics and Neurobiology Major, University of Wisconsin-Madison, Class of 2017

Stella Duong, Genetics Major, University of Wisconsin-Madison, Class of 2017

Keer Jiang, Biology Major, University of Wisconsin-Madison, Class of 2017

Jessica Mendralla, Genetics Major, University of Wisconsin-Madison, Class of 2017

Alyssa Fleischman, Genetics Major, University of Wisconsin-Madison, Class of 2018

Emanuel Perez, Genetics Major, University of Wisconsin-Madison, Class of 2018

Meaghan Threadgill, University of Wisconsin-Madison, Class of 2018

P. Graduate Student Thesis Committee

Current:

Robert Bradley, Cellular and Molecular Biology Training Program

Jack Hunt, Medical Scientist Training Program

Yihe Ma, Physiology Training Program

Zafirah Zaidan, Genetics Training Program

Past:

Samira Musah, Chemistry, Ph.D. awarded in 2012

Sharolyn Kawakami, Genetics Training Program, Ph.D. awarded in 2014

Nicholas Gladman, Genetics Training Program, Ph.D. awarded in 2015

Emily Jobe, Cellular and Molecular Biology Training Program, Ph.D. awarded in 2016

Jeff Jones, Molecular Pharmacology Training Program, Ph.D. awarded in 2017

Q. Profession Membership

Society for Neuroscience, Regular Member.