

Curriculum Vitae

1) Personal Data

Name: Tarik Fuad Haydar
Office phone: 617-638-4249
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Date and place of birth: 8/2/1970, Kalamazoo, MI
Citizenship: USA

2) Education

<u>Institution</u>	<u>Dates</u>	<u>Degrees</u>
<i>Undergraduate:</i>		
University of Massachusetts at Amherst	1988-1992	B.S.
<i>Graduate:</i>		
Medical College of Pennsylvania	1992-1993	
University of Maryland School of Medicine	1993-1997	Ph.D.
<i>Postgraduate:</i>		
Yale University Medical School (Postdoctoral fellow)	1997-2001	
Yale University Medical School (Associate Research Scientist)	2001-2002	

3) Employment

	<u>Dates</u>	<u>Rank</u>
Center for Neuroscience Research	2002-2010	
Department of Pharmacology and Physiology,	2002-2010	Assistant Professor
Department of Pediatrics,	2008-2010	Associate Professor
George Washington University School of Medicine		with Tenure
University of Maryland College Park,	2004-2010	Adjunct Faculty
Program in Neuroscience and Cognitive Science		
Department of Anatomy and Neurobiology	2010-present	Associate Professor
Boston University School of Medicine		

4) Professional Registrations, Licenses, Certifications

n.a.

5) Societies and Honors

Member, Society for Neuroscience, 1993-present
Co-Chair, Session on Neural Development, American Society of Neurochemistry, San Antonio, March 2008

Honors/Fellowships:

Biomedical Science Graduate Fellowship, Medical College of Pennsylvania, 1992-1993
Physiology Graduate Fellowship, University of Maryland School of Medicine, 1993-1994
Membrane Biology Program Fellowship, University of Maryland School of Medicine, 1994-1996
Neuroscience Program Fellowship, University of Maryland School of Medicine, 1996-1997
Graduate Merit Award, University of Maryland School of Medicine, 1997
Master Mentor, CNMC 2008

Study Section:

NIH Review, MDCN-6 study section February 2003
NIH Review, NCF study section October 2004
NIH Review, ZRG1 MDCN-F(04) August 2005
NIH Review, NCF study section February 2006
NIH Review, ZRG1 F03A October 2005, July, 2006
NIH Review, CHHD-C, November 2006
NSF Review, Developmental Systems Cluster, October 2006
NIH Review, NCF study section, July 2007
NIH Review, NINDS "A" study section (NSD-A), October 2007
NIH Review, NCF study section, January 2008
NIH Review, CHHD-C, April 2008
Telethon, Italy, external reviewer, April 2008
NIH Review, NSD-A study section, March 2009
NIH Review, NDPR study section, June 2009
NIH Review, ZRG1 MDCN-F(95)s study section, June 2009
NIH Review, ZRG1 BDA-A (52)R study section, September 2009
NIH Review, DBD study section, October 2009
NIH Review, ZRG1 MDCN-T (03), September 2010
NIH Review, NCF study section, regular member, 2011-

Editorial Duties:

Editorial Board Member, *Developmental Neuroscience*, 2009-present

Manuscript Reviewer:

Journal of Physiology, Journal of Neuroscience, Cell, Science, Cerebral Cortex, Molecular Cell, Neuron, Developmental Neuroscience, Glia, Genesis, PLOS Biology, Nature Reviews Neuroscience, Nature Neuroscience

6) Administrative Duties and University Activities

External Advisor, Neurodevelopmental Faculty Search Committee, NIMH Intramural Program, 2009

Director, Cellular Imaging Core, Mental Retardation and Developmental Disabilities Program, CNMC and GWU, 2004-2010

In this capacity, Dr. Haydar managed the use and maintenance of the wide-field, stereo, and laser scanning fluorescent microscopes which form the Cellular Imaging Core at CNMC and GWU. He was responsible for training and managing a large user community (>50 users) and was assisted by Dr. Anastas Propratilloff, Assistant Director - GWU, and Dr. Lina Chakrabarti, technical assistant.

Institutional Animal Care and Use Committee, CNMC, Member, 2002-2010

Institute of Biomedical Sciences Admissions Committee Member, GWUMC, 2006, 2007

Co-director, Transgenic Mouse Core, Children's Research Institute, CNMC, 2007-2010

Master Mentorship Committee, CNMC, 2008-2010

Research Compliance Committee, CNMC, 2009-2010

Anatomy & Neurobiology Faculty Search Committee, BUSM, 2010-2011

MCB graduate student application review, BUSM, 2011, 2012

GPN applicant interview committee, BUSM, 2011

7) Educational Achievements

a) *Courses Taught*

- Medical Student Tutor, "Medical Physiology," Cardiovascular Physiology Section, University of Maryland School of Medicine, Spring 1995
- Conference Series Leader, "Functional Systems," Conference on Synaptic Transmission, University of Maryland School of Medicine, Spring 1996
- Laboratory Instructor, "Structure and Function of the Nervous System" series, Yale Medical School, Spring 2000, 2001
- Instructor, "Developmental Neurobiology", GWUMC, Fall 2002
- Instructor, BSMC 216 "Skills for Careers in Science: Writing and Presenting Data", Fall 2003
- Instructor, "The Brain and Nervous System, Normal and Abnormal Development", Leadership Education in Neurodevelopmental Disabilities, CNMC, Winter 2005
- Instructor, BSMC 214 "Molecular Medicine II", GWUMC, Summer 2005
- Instructor, BMSC 214 "Molecular Medicine II", GWUMC, Winter 2006
- Instructor, "The Brain and Nervous System, Normal and Abnormal Development", Leadership Education in Neurodevelopmental Disabilities, CNMC, Winter 2005, 2007
- Instructor, Anat 221 "Special Topics in Stem Cell Biology and Regenerative Medicine, GWUMC, Winter 2007
- Facilitator, Mastor Mentorship K Awardee Retreat, March 2009, CNMC.
- Instructor, DC Clinical research Training Consortium: *Grant Writing Seminar*, May, 2009.
- Instructor, Neuroscience Survey Course GMS 778, Lecture: Brain Development and Developmental Disorders, 12/2010
- Instructor, Cellular and Molecular Neuroscience, Individual Practicum, 1/2011-6/2011
- Instructor, Methods in Neuroscience, Lecture on In Vivo transfection, 5/2011
- Course Director and Instructor, Cellular and Molecular Neuroscience, BUSM 2011

b) *Students and postdoctoral fellows*

- Jonathan S. Gal B.S., GWU undergraduate student, 05/2003-09/2004 (currently attending Eastern Virginia Medical College)
- Sophia Smith, M.D., Attending Critical Care Physician, 09/01/2002-10/01/2003
- Melissa Shaya, B.S. graduate intern, Summer 2005 (currently attending Philadelphia College of Osteopathic Medicine)
- Tyler Bysshe, GWU undergraduate student, 08/2004 – 03/2005 (currently attending University of Maryland School of Medicine)
- Victoria Eisenberg, GWU undergraduate intern student, Summer 2006
- Robert Sellke, GWU Biology Department undergraduate intern, 1/2007 – 3/2008 (Currently attending University of Maryland School of Medicine)
- Ivan Navarro-Quiroga, Ph.D., Postdoctoral Fellow, 05/2005 – 12/2007 (currently clinical research coordinator CNMC)
- Elizabeth Stancik, B.S., GWU graduate student 01/2006- 06/2010 (currently postdoc in Chris McBain's laboratory, NICHD)
- Lina Chakrabarti, Ph.D., Postdoctoral Fellow, 12/2004 – 05/2010
- Karine Loulier, Ph.D., Postdoctoral Fellow, 01/2006 – 6/2009 (currently conducting second postdoc with Jean Livet in Paris France)
- Yi-Chun Hsieh, Ph.D., Postdoctoral Fellow, 02/2009 – 06/2010 (currently in second postdoc at JHU)
- Bill Tyler, Ph.D., Postdoctoral Fellow, 07/2009 – present
- Karanda Bowman, M.S., Master's student, 07/2010 - 06/2011
- Joseph Goodliffe, PhD candidate, CMB program BUSM, 06/2011 - present
- Lisa Yanuchefsky, PhD candidate, GPN program BUSM, 06/2011 – present

-Luis Serrano-Olmos, Postdoctoral Fellow, 1/2011-present

Ph.D. thesis committee membership:

- Stephanie Mitchell B.S., Graduate Student, Center for Genetic Medicine, CNMC, thesis committee, 01/2005-05/2009
- Thamara Abouantoun B.S., Graduate Student, IBS, Center for Cancer Medicine, CNMC, thesis committee, 01/2006-04/2010
- Judith Lytle, B.S., Graduate Student, Georgetown University Medical School, thesis committee, 06/2005-12/2006
- Laura Cocas B.S., Graduate Student, Neuroscience Program, Georgetown University Medical School, thesis committee, 03/2006-06/2010
- Linh Aven, MCB Program, 2011-
- Larissa Estrada, A&N, 2011-

8) Consultant Appointments

Consultant, Carl Zeiss Microimaging, September 2004-July 2005. (Activity was paid)

9) Grant Funding

Completed Grants:

Title of Grant: Extracellular Controls of Neocortical Proliferation

Funding Agency: NIH, National Research Service Award, **F32 NS10729**

Dates of Award: 1998 - 2001

Role: PI

% Effort: 100%

This project explored the role of the amino acids GABA and glutamate in regulating cell division of neocortical progenitor cells.

Title of Grant: Molecular Determinants of Neocortical Neurogenesis in Humans and Mice

Funding Agency: Cure Autism Now

Dates of Award: 9/2001 – 8/2002

Role: PI

% Effort: 30%

This grant supported a project investigating the intrinsic differences between human, non-human primate, and rodent neocortical precursor cells.

Title of Grant: Neocortical Development in the Trisomy 16 mouse

Funding Agency: Research Advisory council, CNMC

Dates of Award: 2/2003 – 2/2004

Role: PI

% Effort: 30%

This award was used to support the development of a new project on brain development in the Ts16 mouse models of Down syndrome.

Title of Grant: Dissection microscopes for Center for Neuroscience Research

Funding Agency: Board of Visitors, CNMC

Dates of Award: 3/2003

Role: PI

% Effort: n.a.

This award was used to purchase laboratory microscopes.

Title of Grant: Novel Regulator of Oligodendrocyte Progenitor Migration

Funding Agency: NIH, NINDS, **R21 NS048238-01**

Dates of Award: 2/01/05 - 1/31/07

Role: Co-PI, Vittorio Gallo

% Effort: 15%

This project will determine the effect of endothelin on the migration and proliferation of oligodendrocyte progenitor cells in the postnatal telencephalic subventricular zone using cell and molecular biology as well as time-lapse multiphoton imaging.

Title of Grant: Embryonic Neural Progenitor Dynamics in Mouse Models of Down Syndrome

Funding Agency: Dana Foundation, Neuro-Immuno Imaging Program

Dates of Award: 5/01/04 - 4/31/08

Role: PI

% Effort: 20%

This project is to characterize prenatal cortical development in the Ts65Dn mouse model of Down syndrome, and to compare the findings to previously published datasets from the Ts16 mouse model. The planned experiments include time-lapse imaging, neuroanatomic morphometry, and immunohistochemistry.

Title of Grant: MRDDRC at Children's National Medical Center

Funding Agency: NIH, NICHD, **1P30HD40677**

Dates of Award: 8/1/01 - 7/31/11

Role: Director, Cellular Imaging Core

% Effort: 15%

The main goal of this project is the operation of a center of excellence for research and training in the area of mental retardation and developmental disabilities in Washington, DC. Tarik Haydar is Director of the Cellular Imaging Core.

Title of Grant: Fluorescent Stereo microscope for Center for Neuroscience Research

Funding Agency: Board of Visitors, CNMC

Dates of Award: 3/2008

Role: PI

% Effort: n.a.

This award was used to partially defray the costs of a Zeiss Stereo LUMAR V12 microscope.

Title of Grant: Molecular Control of Brain Growth in the Ts65Dn Mouse Model of Down Syndrome

Funding Agency: Research Advisory Council, CNMC

Dates of Award: 1/2008-12/2008

Role: PI

% Effort:

This award will partially support breeding of Ts65Dn animals with *Olig1/2* heterozygous mice.

Title of Grant: A Novel Genetic and Electrophysiological Approach to Study Excitatory Hippocampal Neurons

Funding Agency: NIH, NINDS, **R21 NS058913**

Dates of Award: 9/1/08 – 8/31/11, 1 yr NCE

Role: PI

% Effort: 15%

We have developed a multidisciplinary approach to study development and function of the excitatory neurons in the hippocampus. Using electroporation to transfect the hippocampal stem cells in utero, we will introduce fluorescent protein markers as well as full-length and truncated versions of the TrkB tyrosine kinase receptor. The functional effects of these molecular changes will be assessed by characterizing cell differentiation using immunochemical staining and by direct electrophysiological measurements using patch clamp recording. These experiments will define a novel and rapid method for assessing the physiology of specific subpopulations of excitatory hippocampal neurons by introducing molecular changes in the germinal cells.

Current Grants:

Title of Grant: Neocortical Neurogenesis and Spindle Dynamics

Funding Agency: NIH, NINDS, **9RO1 NS051852**

Dates of Award: 1/15/04 - 1/14/14

Role: PI

% Effort: 50%

This project seeks to determine the lineage potential and mitotic characteristics of the multiple neocortical stem and progenitor cells present during cortical formation. A multidisciplinary approach, including time-lapse multiphoton microscopy, retroviral tracing, siRNA analysis, and *in utero* precursor cell transplantation will be used to label and follow the precursor cells in situ and *in vivo* over time.

Title of Grant: Neocortical Neurogenesis and Spindle Dynamics

Funding Agency: NIH, NINDS, **3R01NS051852-08S1**

Dates of Award: 1/15/04 - 1/14/14

Role: PI

This supplement was provided to partially defray the costs of a confocal/multiphoton microscope purchase for BUSM to be managed by Dr. Haydar.

Title of Grant: Forebrain development in Down syndrome and in Ts65Dn model mice

Funding Agency: NIH, NICHD/NIMH, **RO1 HD057580**

Dates of Award: 07/01/2009 – 06/30/2012, 1 yr NCE

Role: PI

% Effort: 30%

We have found that development of the neocortex and hippocampus of the Ts65Dn mouse model of Down syndrome is abnormal beginning at early stages of embryonic development. This abnormal growth is due to defects in neural progenitor cell proliferation and subsequent differentiation of excitatory and inhibitory neurons. This

interdisciplinary project will further characterize embryonic and postnatal Ts65Dn forebrain development using cellular, molecular and electrophysiological techniques. This is a collaborative project with Zygmunt Galdzicki's laboratory at USUHS. The main goal of this project is to link the abnormal embryonic forebrain development with altered neuronal differentiation and function after birth.

Title of Grant: Genetic rescue of over-inhibition in the Ts65Dn model of Down syndrome

Funding Agency: NIH, NICHD/NINDS, **9RO1NS076503**

Dates of Award: 09/19/11 - 08/31/16

Role: PI

% Effort: 30%

Our published and Preliminary Studies in the Ts65Dn mouse definitively link abnormalities in prenatal brain development to altered electrophysiology and cognitive ability. Furthermore, we have identified two candidate genes which may play key roles in these abnormalities and here propose a genetic rescue plan in the Ts65Dn mouse. In this application, we will characterize the cellular, molecular and electrophysiological effects of normalizing the copy number of these two candidate genes with the goal of preventing abnormal embryonic CNS development and postnatal function in Ts65Dn animals.

10) Publications

a) *Papers in Refereed Journals:*

1. Cascone, P.J., **Haydar, T.F.**, and Simon, A.E. (1993) Sequences and structures required for recombination between virus-associated RNAs. *Science* 260:801-805.
2. **Haydar, T.F.**, Blue, M.E., Molliver, M.E., Krueger, B.K., and Yarowsky, P.J. (1996) Consequences of trisomy 16 for mouse brain development: Corticogenesis in a model of Down syndrome. *Journal of Neuroscience* 16:6175-6182. – *selected for journal cover image*
3. **Kuida, K., Haydar, T.F., Kuan, C.-Y.**, Gu, Y., Taya, C., Karasuyama, H., , Su., M. S.-S., Rakic, P., and Flavell R.A. (1998) Reduced apoptosis and cytochrome c-mediated caspase activation in mice lacking caspase-9. **These authors contributed equally.** *Cell* 94:325-337. – *selected for journal cover image*
4. **Haydar, T.F.**, Bambrick, L.B., Krueger, B.K., and Rakic, P. (1999) Organotypic slice cultures for analysis of proliferation, cell death, and migration in the embryonic neocortex. *Brain Research Protocols* 4:425-437. (*Published On-Line at Brain Research Interactive July 8, 1999*).
5. **Haydar, T.F.**, Kuan, C-Y., Flavell, R.A, and Rakic, P. (1999) The role of cell death in regulating the size and shape of the mammalian forebrain. *Cerebral Cortex* 9: 621-626.
6. Roth, K., Kuan, C.-Y., **Haydar, T.F.**, D'Sa-Eipper, C., Shindler, K. S., Zheng, T.S., Kuida, K., Flavell, R.A., and Rakic, P. (2000) Epistatic and independent functions of Caspase-3 and Bcl-X_L in developmental programmed cell death. *PNAS* 97: 466-471.

7. **Haydar, T.F.**, Nowakowski, R.S., Yarowsky, P.J., and Krueger, B.K. (2000) Role of founder cell deficit and delayed neuronogenesis in microencephaly of the trisomy 16 mouse. *Journal of Neuroscience* 20(11): 4156-4164.
8. **Haydar, T.F.**, Wang, F., Schwartz, M.L., and Rakic, P. (2000) Differential modulation of proliferation in the neocortical ventricular and subventricular zones. *Journal of Neuroscience*: 20(15): 5764-5774.
9. Whitmarsh, A.J., Kuan, C.-Y., Kennedy, N., Kelkar N., **Haydar, T.F.**, Mordes, J.P., Appel, M., Rossini, A., Jones, S.N., Flavell, R.A., Rakic, P., and Davis, R.J. (2001) Requirement of the JIP1 scaffold protein for stress-induced JNK activation. *Genes and Dev.* 15(18): 2421-2432.
10. **Ang, E., Haydar, T.F.**, and Rakic, P. (2003) Four dimensional migratory coordinates of GABAergic interneurons in the developing mouse cortex. *Journal of Neuroscience* 23(13):5805-5815. **These authors contributed equally.**
11. **Haydar, T.F.**, Ang, E., and Rakic, P. (2003) Mitotic Spindle Rotation and Mode of Cell Division in the Developing Telencephalon, *PNAS* 100: 2890-2895.
12. Gallo, V., and **Haydar, T.** (2003) GABA: Exciting in its own right. *Journal of Physiology* 550.3:665.
13. Cheng, A., **Haydar, T.F.**, Yarowsky, P.J., and Krueger, B.K. (2004) Concurrent generation of subplate and cortical plate neurons in developing Trisomy 16 mouse cortex. *Dev. Neurosci.* 26(2-4): 255-265.
14. **Haydar, T.F.** (2005) Advanced microscopic imaging methods to investigate cortical development and the etiology of mental retardation, *Ment. Retard. Dev. Disab. Reviews*, 11: 303-316.
15. Liu, X., Wang, Q., **Haydar, T.F.**, and Bordey, A. (2005) Nonsynaptic GABAergic signaling in the postnatal subventricular zone controls astrocyte-like cell proliferation, *Nature Neuroscience* 8(9): 1179-1187.
16. Gal, J.S., Morozov, Y.M., Ayoub, A.E., Chatterjee, M., Rakic, P., and **Haydar, T.F.** (2006) Molecular and morphological heterogeneity of neural precursors in the mouse neocortical proliferative zones. *Journal of Neuroscience*, 26(3): 1045-1056.– *selected for journal cover image*
17. Harashima, C., Jacobowitz, J.M., Stoffel, M., **Haydar, T.F.**, Chakrabarti, L., Siarey, R., Galdzicki, Z. (2006) Elevated expression of the G-Protein activated inwardly rectifying potassium channel 2 (GIRK2) in Cerebellar Unipolar Brush Cells of Down Syndrome Mouse Model. *Cell. Mol. Neurobiol.* Jun 17 [Epub ahead of print].
18. Navarro-Quiroga, I., Chittajallu, R., Gallo, V., and **Haydar, T.F.** (2007) Long-term, selective gene expression in developing and adult hippocampal pyramidal neurons using focal in utero electroporation. *Journal of Neuroscience*, 27(19): 5007-5011. – *selected for journal cover image*

19. Ma, J.S.Y., Monu, N., Shen, D.T., Mecklenbrauker, I., Radoja, N., **Haydar, T.F.**, Leitges, M., Frey, A.B., Vukmanovic, S., and Radoja, S. (2007) Protein kinase C delta regulates antigen receptor-induced lytic granule polarization in mouse CD8+ cytotoxic lymphocytes. *J. Immunol.*, 178(12):7814-7821.
20. Slotkin, J.R.*, Chakrabarti, L.*, Dai, H-N., Gallicano, G.I., Carney, R.S.E., Bregman, B.S., Corbin, J.G., and **Haydar, T.F.** (2007) In vivo quantum dot labeling of mammalian neural stem cells. *Developmental Dynamics*, Jul 11 [Epub ahead of print]. *These authors contributed equally.
21. Chakrabarti, L., Galdzicki, Z., and **Haydar, T.F.** (2007) Defects in embryonic neurogenesis and initial synapse formation in the forebrain of the Ts65Dn mouse model of Down syndrome. *Journal of Neuroscience*, 27(43): 11483-95.
22. Corbin, J.G., and **Haydar, T.F.** (2007) Quantum dots for neuroscience research: new tools for old problems? *Nanomedicine*, (5): 579-81.
23. Ma, J.S.Y., **Haydar, T.F.**, and Radoja, S. (2008) PKC δ localizes to secretory lysosomes in CD8+ CTL and directly mediates TCR signals leading to granule exocytosis-mediated cytotoxicity. *J. Immunol.*, 181(7):4716-22.
24. Corbin, J.G., Gaiano, N., Juliano, S.L., Stancik, E., and **Haydar, T.F.** (2008) Regulation of neural progenitor cell development in the nervous system. *Journal of Neurochemistry*, 106(6): 2272-87.
25. Liu, X., Hashimoto-Torii, K., **Haydar, T.F.**, and Rakic, P. (2008) The role of ATP signaling in the migration of intermediate neuronal progenitors to the neocortical subventricular zone. *PNAS USA*, 105(33):11802-7.
26. Loulier, K., Lathia, J.D., Martiens, V., Relucio, J., Mughal, M.R., Tang, S-C., Coksaygan, T., Hall, P.E., Chigurupati, S., Patton, B., Colognato, H., Rao, M.S., Mattson, M.P., **Haydar, T.F.***, and **French-Constant, C.***. (2009) Laminin-binding integrins are essential for anchorage of neocortical neural stem cells to the ventricular surface. ***Co-corresponding authors**, *PLoS Biology*, Aug;7(8):e1000176. Epub 2009 Aug 18.
27. Gadea, A., Aguirre, A.A., **Haydar, T.F.**, and Gallo, V. (2009) A novel role for endothelin 1 as a regulator of oligodendrocyte development. *Journal of Neuroscience*, 29(32):10047-62. PMCID: 2754292.
28. Chakrabarti, L., Best, T.K., Cramer, N.P., Carney, R.S.E., Issac, J.T.R., Galdzicki, Z., and **Haydar, T.F.** (2010) Olig1 and Olig2 triplication causes developmental brain defects in Down syndrome. *Nature Neuroscience*, 13(8):927-34.
29. Stancik, E., Navarro, I., and **Haydar, T.F.** (2010) Heterogeneity of neural precursors in the mammalian ventricular zone generates neuronal diversity during neocortical development. *Journal of Neuroscience*, 30(20):7028-36.
30. Tyler, W.A. and **Haydar, T.F.** (2010) A new contribution to brain convolution: progenitor cell logistics during cortex development. *Nature Neuroscience*, 13(6):656-7.

31. Cocas, L, Georgala, P.A., Mangin, J.M., Clegg, J.M., Kessar, N., **Haydar, T.F.**, Gallo, V., Price, D.J., Corbin, J.G. (2011) Pax6 is required at the telencephalic pallial-subpallial boundary for the generation of neuronal diversity in the postnatal limbic system. *Journal of Neuroscience*, 31(14):5313-5324.
32. Brueing, J.J., **Haydar, T.F.** and Rakic, P. (2011) Neural Stem Cells: Historical perspective and future prospects. *Neuron*, doi:10.1016/j.neuron.2011.05.005.
33. Chakrabarti, L, Scafidi, J., Gallo, V. and **Haydar, T.F.** (2011) Environmental enrichment rescues postnatal neurogenesis defect in the male and female Ts65Dn mouse model of Down syndrome. *Developmental Neurobiology*, Special Issue on Down syndrome and Fragile X, (Aug 25 Epub ahead of print).
34. Hevner, R.F. and **Haydar, T.F.** (2012) The (not necessarily) convoluted role of basal radial glia in cortical neurogenesis. *Cereb Cortex*, (Nov23, 2011 Epub ahead of print) 22(2):465-8.
35. **Haydar, T.F.** and Reeves, R.R. (2012) Gene dosage, brain development and cognition in Down syndrome. *Trends Neurosciences*, 35(2):81-91.
36. Best, T.K., Cramer, N.P., Chakrabarti, L., **Haydar, T.F.** and Galdzicki, Z. (2012) Dysfunctional hippocampal inhibition in the Ts65Dn mouse model of Down syndrome. *Exp. Neurol.*, 233(2):749-57.

b) *Chapters in Books:*

Flavell, R.A., Kuida, K., Zheng, T.S., **Haydar, T.F.**, Kuan, C-Y., Su, M.S., Rakic, P. (1999) The role of caspases in apoptosis *in vivo* studied by gene targeting. *SKB Symposium*.

Haydar, T.F. and Chakrabarti, L (2008). Disorders of histogenesis: Neuron Proliferation: Down syndrome. L.R. Squire (Editor) *New Encyclopedia of Neuroscience*, Elsevier Ltd, UK, *in press*.

c) *Abstracts:*

Haydar, T.F., Krueger, B.K., and Yarowsky, P.J. Cortical development in the trisomy 16 mouse: Abnormal stratification and cellular differentiation. *Soc. Neurosci. Abst.* 21:30 (1995).

Haydar, T.F., Krueger, B.K., and Yarowsky, P.J. The role of neuroblast proliferation in the abnormal development of the mouse trisomy 16 cerebral cortex. *2nd Biennial Workshop on Mouse Molecular Genetics, Jackson Labs, Bar Harbor ME* (1996).

Haydar, T.F., Krueger, B.K., and Yarowsky, P.J. The role of neuroblast proliferation in the abnormal development of the mouse trisomy 16 cerebral cortex. *Soc. Neurosci. Abst.* 22:524 (1996).

Haydar, T.F., Nowakowski, R.S., Krueger, B.K., and Yarowsky, P.J. Linking proliferation and apoptosis: delayed development of the cerebral cortex in the trisomy 16 mouse. *Soc. Neurosci. Abst.* 23:298 (1997).

Haydar, T.F., Kuida, K., Kuan, C-Y., Su, M. S.-S., Flavell, R.A., and Rakic, P. Selective

forebrain and midbrain abnormalities in Caspase-9 deficient mice. *Soc. Neurosci. Abst.* 24:3 (1998) and Gordon Conference on Neural Development (1998).

Haydar, T.F., Wang, F., Schwartz, M.L., and Rakic, P. GABA and glutamate differentially regulate the proliferation of ventricular and subventricular zone progenitors. *Soc. Neurosci. Abst* 25:255 (1999).

Haydar, T.F., Kornack, D.R., and Rakic, P. Differences in the corticogenic cell cycle between primates and rodents are maintained in vitro: evidence for intrinsic regulation of neocortical diversity. *Soc. Neurosci. Abst* 26:608 (2000).

Haydar, T.F., Ang, E., and Rakic, P. Real time quantitative analysis of murine neocortical neurogenesis: Kinetics of progenitor division. *Soc. Neurosci. Abst* (2001).

Ang, E., **Haydar, T.F.**, and Rakic, P. Real time quantitative analysis of murine neocortical neurogenesis: Interkinetic and cell migration. *Soc. Neurosci. Abst* (2001).

Gal, J.S., Morozov, Y., Rakic, P., and **Haydar, T.F.** Diversity of dividing cells in the murine embryonic neocortical ventricular and subventricular zones. *Soc. Neurosci. Abst* 832.3 (2004).

Gadea, A., **Haydar, T.F.**, and Gallo, V. Astrocyte-derived ET-1 promotes oligodendrocyte progenitor migration and delays their differentiation. *Soc. Neurosci. Abst.* 152.16 (2004).

Liu, X., Wang, Q., **Haydar, T.F.**, and Bordey, A. Gabaergic signaling between neuronal precursors and astrocyte-like cells in the postnatal subventricular zone. *Soc. Neurosci. Abst.* 383.14 (2004).

Slotkin, J.R., Chakrabarti, L., Dai, H.N., Gallicano, G.I., Bregman, B.S., Corbin, J.G., and **Haydar, T.F.** In vivo quantum dot labeling of embryonic neural precursor cells. *Soc. Neurosci. Abst.* 255.15 (2005).

Slotkin, J.R., Dai, H., Gallicano, I., Bregman, B., Corbin, J., and **Haydar, T.F.**, *In Vivo* Quantum Dot labeling of Stem Cells in the Developing Embryonic Nervous System. AANS/CNS Joint Section on Pediatric Neurosurgery Meeting (2005).

Navarro-Quiroga, I., Chittajallu, R., Gallo, V., and **Haydar, T.F.** Focal in utero electroporation: efficient and reliable targeting of hippocampal pyramidal neurons from development to adulthood. Society of Neuroscience Meeting, Atlanta, GA, (2006).

Chakrabarti, L., and **Haydar, T.F.**. Delay in Forebrain Development in Ts65Dn mouse model of Down syndrome. Society of Neuroscience Meeting, Atlanta, GA, (2006).

Slotkin, J.R., Dai, H., Gallicano, I., Bregman, B., Corbin, J., and **Haydar, T.F.**, *In Vivo* Quantum Dot labeling of Stem Cells in the Developing Embryonic Nervous System. Gordon Conference on Neural Development (2006).

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ventricular zone. Stem Cell Interactions with their Microenvironmental Niche, Keystone, Colorado, (2007).

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Navarro-Quiroga, I., Stancik, E., Selke, R., **Haydar, T.F.**, In utero electrofection is M-phase dependent: Implications for cell cycle analysis of progenitor populations of the developing murine neocortical ventricular zone. Soc. Neurosci. Abst. 2007

Cocas, L.A., Carney, R.S.E., Kessar, N., **Haydar, T.F.**, Corbin, J.G., Dynamic cell movements and their relationship to fate at the telencephalic corticostriatal border. Soc. Neurosci. Abst. 2007

Chakrabarti, L., **Haydar, T.F.**, Mechanisms of altered forebrain development in the Ts65Dn mouse model of Down syndrome. Soc. Neurosci. Abst. 2007

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Loulier K., Lathia J.D., Rao M.S., Mattson M.P., French-Constant C., **Haydar T.F.** *$\beta 1$ integrin maintains integrity of the embryonic neocortical stem cell niche*. Gordon Research Conferences in "Neural Development" Aug. 17-22th, Salve Regina University, Newport, Rhode Island, USA 2008.

Loulier, K., Corbin, J., **Haydar, T.F.** EGF/Akt-1 pathway is involved in the regulation of telencephalic progenitor proliferation during mouse development. Soc. Neurosci. Abst. 2008.

Stancik, E., Kuan, C.-Y., **Haydar, T.F.** Fate mapping progenitor cells of the telencephalic ventricular zone via in utero electroporation. Soc. Neurosci. Abst. 2008.

Chakrabarti, L., Carney, R.S.E., **Haydar, T.F.** Defective embryonic neurogenesis in the dorsal and ventral telencephalon leads to an altered ratio of excitatory and inhibitory neurons in the postnatal cortex of the Ts65Dn mouse model of Down syndrome. Soc. Neurosci. Abst. 2008.

11) Invited Presentations

Department of Neuroscience and Cell Biology, UMDNJ, 2002
Title: Determinants of neocortical growth.

Department of Neuroscience, SUNY Upstate Medical University, 2002
Title: The cell cycle and mitotic spindle dynamics during genesis of the mammalian cerebral cortex.

Department of Cell Biology and Anatomy, New York Medical College, 2002
Title: The cell cycle and mitotic spindle dynamics during genesis of the mammalian cerebral cortex.

Department of Neurosurgery, Weill Medical College, Cornell University, 2002
Title: The cell cycle and mitotic spindle dynamics during genesis of the mammalian cerebral cortex.

Forum of European Neuroscience (FENS) meeting invited lecture, Paris, “Molecular Controls of Neural Progenitor Dynamics in the Developing Neocortex,” 2002

Department of Physiology, UMaryland School of Medicine, 2002
Title: Neural stem cell dynamics: heterogeneity in the ventricular zone of the mammalian cerebral cortex.

Department of Pharmacology, GWUMC, 2002
Title: Neural stem cell dynamics investigated using time-lapse multiphoton imaging.

Mental Retardation and Developmental Disabilities Series, CNMC, Fall 2002
Title: Revisiting animal models of Down syndrome.

Department of Neuroscience, Georgetown University, 2003
Title: Molecular Controls of Neural Progenitor Dynamics in the Developing Neocortex.

Department of Anatomy, Physiology, and Genetics, USUHS, 2003
Title: Mammalian neocortical development.

Duke Live Cell Symposia, 2004
Title: Live cell multiphoton imaging: The challenge of translating novel observations into measurable results.

Center for Neuropharmacology and Neuroscience, Albany Medical College, 2004
Title: Progenitor proliferation dynamics in the embryonic neocortex.

Martek, Inc., CRI Site Visit, 2004
Title: Molecular mechanisms of cortical development: Stem cell proliferation and neuronal migration.

Department of Neuroscience, Georgetown University, 2005
Title: Uncovering Precursor Cell Heterogeneity in the Neocortical Germinal Zones: *the long and short of it.*

Board Retreat, Evident Technologies, Inc., Las Vegas, 2006
Title: In vivo quantum dot labeling of embryonic neural precursor cells.

Grand Rounds, Neurosurgery, Children's Hospital, Harvard Medical School, 2006
Title: Embryonic development of the Ts65Dn mouse brain: A novel hypothesis for the etiology of cognitive deficits in Down syndrome.

Department of Cell Engineering, George Mason University, 2006
Title: Neural stem cell dynamics during development of the telencephalon: New methods for imaging and delivery.

CNMC, Mental Retardation and Developmental Disabilities Research Center, 2006
Title: Embryonic development of the Ts65Dn mouse brain: A novel hypothesis for the

etiology of cognitive deficits in Down syndrome.

Center for Neural Engineering, Penn State University, 2006

Title: Consequences of temporal delays in brain development: Lessons from mouse models of Down syndrome.

Presentation to His Royal Highness Prince Philip, Duke of Edinburgh, 2007

Title: Neurodevelopmental research on Down syndrome and autism at Children's National Medical Center.

Department of Anatomy, GWUMC 2007

Title: Morphological and physiological discrimination between multiple cell types in the mammalian neocortical ventricular zone.

39th Annual ASN meeting, San Antonio, TX 2008 (Co-chair and Speaker at symposium on "Generation of Neural Progenitor Diversity")

Title: The proliferation and lineage potential of multiple populations of neural precursors in the embryonic mammalian ventricular zone

Maine Medical Center Research Institute, 2008

Title: The role of neural stem cells in forebrain development in Down syndrome – a molecular/cellular approach to mental retardation.

Department of Pharmacology, Boston University, 2008

Title: The role of neural stem cell heterogeneity during neocortical and hippocampal development.

CNMC Autism Conference, 2009

Department of Neuroscience, UConn Farmington, 2009

Title: Uncovering the etiology of mental retardation: new cellular, molecular and physiological evidence from the Ts65Dn mouse model of Down syndrome.

Department of Pathology, Northwestern University, 2009

Title: Uncovering the etiology of mental retardation: new cellular, molecular and physiological evidence from the Ts65Dn mouse model of Down syndrome.

CNMC, Mental Retardation and Developmental Disabilities Research Center, 2009

Title: The role of gene triplication in brain development of the Ts65Dn mouse model of Down syndrome: a genetic rescue of the neurological phenotype.

Department of Physiology, Dartmouth Medical School, 2009

Title: The role of Olig1 and Olig2 transcription factors in brain development in Down syndrome.

Department of Anatomy and Neurobiology, University of Vermont School of Medicine, 2009

Title: The role of "short neural precursors" (SNPs), a novel progenitor cell type, during development of the cerebral cortex.

Department of Physiology, Johns Hopkins University School of Medicine, 2009

Title: The role of triplication of the *Olig* transcription factors in brain development in Down syndrome.

Cincinnati Children's Hospital, September 20, 2010

Neuroscience Center, UNC Chapel Hill, February 24, 2011

UMaryland, Dept of Physiology, April 14, 2011

Yale Neurobiology, February 17, 2011

NICHD Interdisciplinary Training Conference on Developmental Disabilities, Keynote Address, March 6, 2012

Title: Brain Development in Down Syndrome: Insights from Mouse Models.

12) **Service to Community**

Philanthropic tours for potential donors to CNMC (approximately 20 tours from 2003-2007)

Presentations to the CNMC Board (4 presentations from 2005-2007)

Member, Diversity Committee, 2007 Strategic Plan, Montessori International Children's House, Annapolis, MD.