

CURRICULUM VITAE

Shawn M. Ferguson, Ph.D.

Associate Professor
Department of Cell Biology
Yale University
New Haven, CT

Education:

B.S. University of Ottawa (Biochemistry-Nutrition) 1997
M.S. University of Ottawa (Physiology) 1999
Ph.D. Vanderbilt University (Neuroscience) 2004

Career/Academic Appointments:

2004-08 Postdoctoral Fellow, Department of Cell Biology, Yale University School of Medicine, New Haven, CT
2008-10 Associate Research Scientist, Dept. of Cell Biology, Yale University School of Medicine, New Haven, CT
2010-2016 Assistant Professor, Dept. of Cell Biology, Yale University School of Medicine, New Haven, CT
2016- Associate Professor, Dept. of Cell Biology, Yale University School of Medicine, New Haven, CT

Professional Honors & Recognition

Awards and Fellowships

2012: Ellison Medical Foundation New Scholar Award in Aging Research
2005: Canadian Institutes of Health Research Postdoctoral Fellowship
2003: Society for Neuroscience/Eli Lilly Graduate Student Travel Award
1997: University of Ottawa Admission Scholarship
1993: Ontario Scholar

Invited Speaking Engagements, Presentations, Symposia & Workshops:

2016: Boston University, Department of Biochemistry, Boston, MA: "Lysosome Function, Dysfunction and Neurodegenerative Disease"
2016: FASEB Conference on GTPases in Trafficking, Autophagy and Disease, West Palm Beach, FL: "Mechanisms supporting lysosomal responses to intracellular nutrient availability"
2016: NHLBI Working group on Lipid and Lipoprotein Metabolism and Alzheimer's Disease, Bethesda, MD: "Endolysosomal Membrane Traffic Defects In Alzheimer's Disease"
2016: 21st Biennial Meeting of the International Society for Developmental Neuroscience (ISDN), Nice, France: "Contributions of amyloid plaque-associated axonal lysosome transport and maturation defects to Alzheimer's disease pathology"

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- 2016: Keystone Symposia on Neurological Disorders of Intracellular Trafficking, Keystone, CO: “Contributions of amyloid plaque-associated axonal lysosome transport and maturation defects to Alzheimer’s disease pathology”
- 2015: American Society for Cell Biology, Annual Meeting, San Diego, CA, Special Interest Sub-Group on Autophagy in Disease and Survival: “Mechanisms supporting lysosomal responses to intracellular nutrient availability”
- 2015: Janelia/HHMI Conference, The Long and Winding Road: Neuronal Trafficking in Physiology and Disease, Ashburn, VA: “A massive accumulation of luminal protease deficient lysosomes in axons that surround amyloid plaques is a defining feature of Alzheimer’s disease”
- 2015: McGill University/Montreal Neurological Institute: Killam Seminar Series: “Lysosome function, dysfunction and neurodegenerative disease?”
- 2015: Lysosomal Diseases Gordon Research Conference, Galveston, TX: “Birt-Hogg-Dubé Syndrome and the lysosomal sensing of intracellular nutrients”
- 2015: University of Michigan, Kellog Eye Center Seminar: “Lysosome Function, Dysfunction and Neurodegenerative Disease”
- 2014: American Society for Cell Biology Annual Meeting, Philadelphia, PA, Special Interest Sub-Group on Endolysosome Function in Cellular and Pathophysiology: “Mechanisms supporting lysosomal control of intracellular nutrient and energy homeostasis”
- 2014: Columbia University: Department of Pathology and Cell biology Seminar: “Lysosome Function, Dysfunction and Neurodegenerative Disease”
- 2014: University of Ottawa: Department of Cellular and Molecular Medicine Seminar: “Lysosomal nutrient sensing in cancer and neurodegenerative disease”
- 2014: University of California San Francisco/Gladstone Institutes Seminar: “Lysosome function, dysfunction and disease”
- 2013: American Society for Cell Biology Annual Meeting, New Orleans, LA, Mini-symposium: “Folliculin, the Birt-Hogg-Dubé syndrome tumor suppressor, controls the nutrient-dependent activation of Rag GTPases”
- 2012: Lysosomes and Endocytosis Gordon Research Conference, Andover, NH: “Eavesdropping on conversations between lysosomes and the nucleus”
- 2011: American Society for Cell Biology Annual Meeting, Denver, CO, Mini-symposium: “The regulated association of MiT/TFE transcription factors with lysosomes and the homeostatic control of lysosomal function”
- 2010: Université de Montreal, IRIC Symposium on Vesicular Trafficking and Cellular Signaling: “Unraveling mechanisms of endocytic membrane traffic”
- 2008: Harden Conference on Ion Channels and Synaptic Transmission, Chester, UK
- 2008: Lysosomes and Endocytosis Gordon Research Conference, Andover, NH
- 2008: American Society for Cell Biology Annual Meeting, San Francisco, CA, Mini-symposium
- 2007: University of Pittsburgh, Department of Neurobiology Seminar: “Unraveling the role of dynamins in synaptic vesicle endocytosis”
- 2007: Cornell University, Department of Molecular Medicine Seminar: “Unraveling the role of dynamins in synaptic vesicle endocytosis”
- 2007: 7th Anneberg Conference, Membrane Traffic in the Secretory Pathway, Schloss Goldberg, Austria: “The function of dynamin in synaptic vesicle endocytosis”
- 2007: American Society for Cell Biology Annual Meeting, Washington, DC, Mini-symposium
- 2007: Society for Neuroscience Annual Meeting, San Diego, CA
- 2007: Molecular Membrane Biology Gordon Research Conference, Andover, NH
- 2006: Proprotein Processing, Trafficking and Secretion Gordon Research Conference, New London, NH: “The role of dynamin in synaptic vesicle recycling”

2003: Society for Neuroscience Annual Meeting, New Orleans, LA, Mini-Symposium: “Activity-dependent regulation of presynaptic choline uptake coincides with trafficking and plasma membrane retention of choline transporter proteins.”

Professional Service

Journal Service:

Reviewer

2005-present Peer Reviewer of Manuscripts: *Nature*, *Nature Cell Biology*, *Science*, *Science Signaling*, *Cell*, *Neuron*, *Developmental Cell*, *Journal of Cell Biology*, *Journal of Neuroscience*, *Molecular Biology of the Cell*, *Oncogene*, *EMBO Journal*, *EMBO Molecular Medicine*, *Traffic*, *Journal of Neurochemistry*, *Nature Communications*

Yale University Service:

University Committees

2011-present Biochemistry, Biophysics and Structural Biology (BBSB) Graduate Program Admissions Committee, Yale University

Medical School Committees

2015-present Yale University Alzheimer’s Disease Research Center Executive Committee

Departmental Committees

2011-2012 Department of Cell Biology Faculty Search Committee

2015-present Department of Neuroscience Faculty Search Committee

Bibliography:

Note: The publications in my bibliography are sub-grouped by career stage to better highlight where the research originated.

Graduate Studies

1. **Ferguson S**, Hébert RL, Laneuville O. NS-398 upregulates constitutive cyclooxygenase-2 expression in the M-1 cortical collecting duct cell line. *Journal of the American Society of Nephrology : JASN*. 1999; 10(11):2261-71. PMID: 10541284
2. Apparsundaram S, **Ferguson SM**, George AL Jr, Blakely RD. Molecular cloning of a human, hemicholinium-3-sensitive choline transporter. *Biochemical and Biophysical Research Communications*. 2000; 276(3):862-7. PMID: 11027560
3. Nasrallah R, Laneuville O, **Ferguson S**, Hébert RL. Effect of COX-2 inhibitor NS-398 on expression of PGE2 receptor subtypes in M-1 mouse CCD cells. *American Journal of Physiology. Renal Physiology*. 2001; 281(1):F123-32. PMID: 11399653
4. Apparsundaram S, **Ferguson SM**, Blakely RD. Molecular cloning and characterization of a murine hemicholinium-3-sensitive choline transporter. *Biochemical Society Transactions*. 2001; 29(Pt 6):711-6. PMID: 11709061

5. Kus L, Borys E, Ping Chu Y, **Ferguson SM**, Blakely RD, Emborg ME, Levey AI, Mufson EJ. Distribution of high affinity choline transporter immunoreactivity in the primate central nervous system. *The Journal of Comparative Neurology*. 2003; 463(3):341-57. PMID: 12820166
6. **Ferguson SM**, Savchenko V, Apparsundaram S, Zwick M, Wright J, Heilman CJ, Levey AI, Blakely RD. Vesicular localization and activity-dependent trafficking of presynaptic choline transporters. *The Journal of Neuroscience : The Official Journal of the Society for Neuroscience*. 2003; 23(30):9697-709. PMID: 14585997
7. Volpicelli-Daley LA, Hrabovska A, Duysen EG, **Ferguson SM**, Blakely RD, Lockridge O, Levey AI. Altered striatal function and muscarinic cholinergic receptors in acetylcholinesterase knockout mice. *Molecular Pharmacology*. 2003; 64(6):1309-16. PMID: 14645660
8. Hoover DB, Ganote CE, **Ferguson SM**, Blakely RD, Parsons RL. Localization of cholinergic innervation in guinea pig heart by immunohistochemistry for high-affinity choline transporters. *Cardiovascular Research*. 2004; 62(1):112-21. PMID: 15023558
9. **Ferguson SM**, Bazalakova M, Savchenko V, Tapia JC, Wright J, Blakely RD. Lethal impairment of cholinergic neurotransmission in hemicholinium-3-sensitive choline transporter knockout mice. *Proceedings of the National Academy of Sciences of the United States of America*. 2004; 101(23):8762-7. PMID: 15173594, PMCID: PMC423269
10. **Ferguson SM**, Blakely RD. The choline transporter resurfaces: new roles for synaptic vesicles? *Molecular Interventions*. 2004; 4(1):22-37. PMID: 14993474
11. Gates J Jr, **Ferguson SM**, Blakely RD, Apparsundaram S. Regulation of choline transporter surface expression and phosphorylation by protein kinase C and protein phosphatase 1/2A. *The Journal of Pharmacology and Experimental Therapeutics*. 2004; 310(2):536-45. PMID: 15064333
12. Lund D, Ruggiero AM, **Ferguson SM**, Wright J, English BA, Reisz PA, Whitaker SM, Peltier AC, Blakely RD. Motor neuron-specific overexpression of the presynaptic choline transporter: impact on motor endurance and evoked muscle activity. *Neuroscience*. 2010; 171(4):1041-53. PMID: 20888396, PMCID: PMC2992794
13. Ruggiero AM, Wright J, **Ferguson SM**, Lewis M, Emerson KS, Iwamoto H, Ivy MT, Holmstrand EC, Ennis EA, Weaver CD, Blakely RD. Nonisotopic assay for the presynaptic choline transporter reveals capacity for allosteric modulation of choline uptake. *ACS Chemical Neuroscience*. 2012; 3(10):767-81. PMID: 23077721, PMCID: PMC3474274

Postdoctoral Research

14. **Ferguson SM**, Brasnjo G, Hayashi M, Wölfel M, Collesi C, Giovedi S, Raimondi A, Gong LW, Ariel P, Paradise S, O'Toole E, Flavell R, Cremona O, Miesenbock G, Ryan TA, De Camilli P. A selective activity-dependent requirement for dynamin 1 in synaptic vesicle endocytosis. *Science*. 2007; 316(5824):570-4. PMID: 17463283

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15. Hayashi M, Raimondi A, O'Toole E, Paradise S, Collesi C, Cremona O, **Ferguson SM**, De Camilli P. Cell- and stimulus-dependent heterogeneity of synaptic vesicle endocytic recycling mechanisms revealed by studies of dynamin 1-null neurons. *Proceedings of the National Academy of Sciences of the United States of America*. 2008; 105(6):2175-80. PMID: 18250322, PMCID: PMC2538894
16. Lou X, Paradise S, **Ferguson SM**, De Camilli P. Selective saturation of slow endocytosis at a giant glutamatergic central synapse lacking dynamin 1. *Proceedings of the National Academy of Sciences of the United States of America*. 2008; 105(45):17555-60. PMID: 18987309, PMCID: PMC2579887
17. **Ferguson SM**, Raimondi A, Paradise S, Shen H, Mesaki K, Ferguson A, Destaing O, Ko G, Takasaki J, Cremona O, O'Toole E, De Camilli P. Coordinated actions of actin and BAR proteins upstream of dynamin at endocytic clathrin-coated pits. *Developmental Cell*. 2009; 17(6):811-22. PMID: 20059951, PMCID: PMC2861561
18. Shen H, **Ferguson SM**, Dephoure N, Park R, Yang Y, Volpicelli-Daley L, Gygi S, Schlessinger J, De Camilli P. Constitutive activated Cdc42-associated kinase (Ack) phosphorylation at arrested endocytic clathrin-coated pits of cells that lack dynamin. *Molecular Biology of the Cell*. 2011; 22(4):493-502. PMID: 21169560, PMCID: PMC3038647
19. Raimondi A, **Ferguson SM***, Lou X, Armbruster M, Paradise S, Giovedi S, Messa M, Kono N, Takasaki J, Capello V, O'Toole E, Ryan TA, De Camilli P. Overlapping role of dynamin isoforms in synaptic vesicle endocytosis. *Neuron*. 2011; 70(6):1100-14. PMID: 21689597, PMCID: PMC3190241. *Co-First and Co-Corresponding Author
20. Liu YW, Neumann S, Ramachandran R, **Ferguson SM**, Pucadyil TJ, Schmid SL. Differential curvature sensing and generating activities of dynamin isoforms provide opportunities for tissue-specific regulation. *Proceedings of the National Academy of Sciences of the United States of America*. 2011; 108(26):E234-42. PMID: 21670293, PMCID: PMC3127893
21. Milosevic I, Giovedi S, Lou X, Raimondi A, Collesi C, Shen H, Paradise S, O'Toole E, **Ferguson SM**, Cremona O, De Camilli P. Recruitment of endophilin to clathrin-coated pit necks is required for efficient vesicle uncoating after fission. *Neuron*. 2011; 72(4):587-601. PMID: 22099461, PMCID: PMC3258500
22. **Ferguson SM***, De Camilli P. Dynamin, a membrane-remodelling GTPase. *Nature Reviews Molecular Cell Biology*. 2012; 13(2):75-88. PMID: 22233676, PMCID: PMC3519936. *Co-Corresponding Author
23. Lou X, Fan F, Messa M, Raimondi A, Wu Y, Looger LL, **Ferguson SM**, De Camilli P. Reduced release probability prevents vesicle depletion and transmission failure at dynamin mutant synapses. *Proceedings of the National Academy of Sciences of the United States of America*. 2012; 109(8):E515-23. PMID: 22308498, PMCID: PMC3286982
24. Sousa LP, Lax I, Shen H, **Ferguson SM**, De Camilli P, Schlessinger J. Suppression of EGFR endocytosis by dynamin depletion reveals that EGFR signaling occurs primarily at the plasma membrane. *Proceedings of the National Academy of Sciences of the United States of America*. 2012; 109(12):4419-24. PMID: 22371560, PMCID: PMC3311323

25. Soda K, Balkin DM, **Ferguson SM**, Paradise S, Milosevic I, Giovedi S, Volpicelli-Daley L, Tian X, Wu Y, Ma H, Son SH, Zheng R, Moeckel G, Cremona O, Holzman LB, De Camilli P, Ishibe S. Role of dynamin, synaptojanin, and endophilin in podocyte foot processes. *The Journal of Clinical Investigation*. 2012; 122(12):4401-11. PMID: 23187129, PMCID: PMC3533561
26. Destaing O, **Ferguson SM**, Grichine A, Oddou C, De Camilli P, Albiges-Rizo C, Baron R. Essential function of dynamin in the invasive properties and actin architecture of v-Src induced podosomes/invadosomes. *PloS One*. 2013; 8(12):e77956. PMID: 24348990, PMCID: PMC3857171
27. Armbruster M, Messa M, **Ferguson SM**, De Camilli P, Ryan TA. Dynamin phosphorylation controls optimization of endocytosis for brief action potential bursts. *eLife*. 2013; 2:e00845. PMID: 23908769, PMCID: PMC3728620
28. Park RJ, Shen H, Liu L, Liu X, **Ferguson SM***, De Camilli P. Dynamin triple knockout cells reveal off target effects of commonly used dynamin inhibitors. *Journal of Cell Science*. 2013; 126(Pt 22):5305-12. PMID: 24046449, PMCID: PMC3828596. *Co-Corresponding Author
29. Lee MY, Skoura A, Park EJ, Landskroner-Eiger S, Jozsef L, Luciano AK, Murata T, Pasula S, Dong Y, Bouaouina M, Calderwood DA, **Ferguson SM**, De Camilli P, Sessa WC. Dynamin 2 regulation of integrin endocytosis, but not VEGF signaling, is crucial for developmental angiogenesis. *Development*. 2014; 141(7):1465-72. PMID: 24598168, PMCID: PMC3957370
30. Willinger T, **Ferguson SM**, Pereira JP, De Camilli P, Flavell RA. Dynamin 2-dependent endocytosis is required for sustained S1PR1 signaling. *The Journal of Experimental Medicine*. 2014; 211(4):685-700. PMID: 24638168, PMCID: PMC3978280
31. Wu Y, O'Toole ET, Girard M, Ritter B, Messa M, Liu X, McPherson PS, **Ferguson SM**, De Camilli P. A dynamin 1-, dynamin 3- and clathrin-independent pathway of synaptic vesicle recycling mediated by bulk endocytosis. *eLife*. 2014; 3:e01621. PMID: 24963135, PMCID: PMC4107917
32. Shin NY, Choi H, Neff L, Wu Y, Saito H, **Ferguson SM**, De Camilli P, Baron R. Dynamin and endocytosis are required for the fusion of osteoclasts and myoblasts. *The Journal of Cell Biology*. 2014; 207(1):73-89. PMID: 25287300, PMCID: PMC4195819
33. Willinger T, Staron M, **Ferguson SM**, De Camilli P, Flavell RA. Dynamin 2-dependent endocytosis sustains T-cell receptor signaling and drives metabolic reprogramming in T lymphocytes. *Proceedings of the National Academy of Sciences of the United States of America*. 2015; 112(14):4423-8. PMID: 25831514, PMCID: PMC4394306
34. Fan F, Ji C, Wu Y, **Ferguson SM**, Tamarina N, Philipson LH, Lou X. Dynamin 2 regulates biphasic insulin secretion and plasma glucose homeostasis. *J Clin Invest*. 2015; doi: 10.1172/JCI80652.

Assistant Professor-Present

35. Rocznik-Ferguson A, Petit CS, Froehlich F, Qian S, Ky J, Angarola B, Walther TC, **Ferguson SM**. The transcription factor TFEB links mTORC1 signaling to transcriptional control of lysosome homeostasis. *Science Signaling*. 2012; 5(228):ra42. PMID: 22692423, PMCID: PMC3437338
36. Petit CS, Rocznik-Ferguson A, **Ferguson SM**. Recruitment of folliculin to lysosomes supports the amino acid-dependent activation of Rag GTPases. *The Journal of Cell Biology*. 2013; 202(7):1107-22. PMID: 24081491, PMCID: PMC3787382
37. Gowrishankar S, Yuan P, Wu Y, Schrag M, Paradise S, Grutzendler J, De Camilli P, **Ferguson SM**. Massive accumulation of luminal protease-deficient axonal lysosomes at Alzheimer's disease amyloid plaques. *Proceedings of the National Academy of Sciences of the United States of America*. 2015; 112(28): E3699-708. PMID: 26124111, PMCID: PMC4507205
38. **Ferguson SM**. Beyond indigestion: emerging roles for lysosome-based signaling in human disease. *Current Opinion in Cell Biology*. 2015; 35:59-68. PMID: 25950843, PMCID: PMC4529762
39. **Ferguson SM**. Membrane traffic en route to cancer. *Science*. 2015; 350(6257): 162-163. PMID: 26450197
40. Gowrishankar S and **Ferguson SM**. Lysosomes relax in the cellular suburbs. *The Journal of Cell Biology*. 2016; 212(6) 617-619. PMID: 26975848
41. Nicholson, AM, Finch NA, de Almeida M, Perkerson RB, van Blitterswijk M, Wojtas A, Cenik B, Rotondo S, Pottier C, Zahir HA, Inskeep V, Crook JE, Karydas A, Mitic L, Sun Y, Dickson DW, Bu G, Herz J, Yu G, Miller BL, **Ferguson SM**, Petersen RC, Graff-Radford N, Blangero J, Rademakers R. Prosaposin is a novel regulator of progranulin levels and oligomerization. *Nature Commun.*, 2016 Jun 30;7:11992. doi: 10.1038/ncomms11992. PMID: 27356620
42. Gray MA, Choy CH, Dayam RM, Somerville A, Xiao X, **Ferguson SM**, Botelho R. Fcγ receptor-mediated phagocytosis enhances lysosomal and bactericidal properties by activating the transcription factor TFEB. *Current Biology*, 2016; 26(15):1955-64. PMID: 27397893
43. Amick JA, Rocznik-Ferguson A, **Ferguson SM**. C9orf72 binds SMCR8, localizes to lysosomes, and regulates mTORC1 signaling. *Molecular Biology of the Cell*, 2016; 27(20):3040-3051. PMID: 27559131
44. Gayle S, Landrette S, Beeharry N, Conrad C, Hernandez M, Beckett P, **Ferguson SM**, Mandelkern T, Zheng M, Xu T, Rothberg J, Lichenstein H. Identification of apilimod as a first-in-class PIKfyve kinase inhibitor for treatment of B-cell non-Hodgkin lymphoma. *Blood*, 2017, In Press. PMID: 28104689