Curriculum vitae

Date Prepared: June 3, 2020

Name: Samuel K. McBrayer, Ph.D.

Office Address: 5323 Harry Hines Blvd.
Room NL 11.140A
Dallas, Texas 75390-8502

Work Phone: 214-648-3730

Work E-Mail: Samuel.McBrayer@UTSouthwestern.edu

Education

Year	Degree (Honors)	Field of Study (Thesis advisor for PhDs)	Institution
2006	B.S. Magna Cum Laude, Phi Beta Kappa	Biochemistry	Baylor University
2011	Certificate	Management	Kellogg School of Management, Northwestern University
2012	Ph.D.	Cancer Biology (Advisor: Steven T. Rosen, M.D.)	Feinberg School of Medicine, Northwestern University
2019	Certificate	Cold Spring Harbor Laboratory Metabolomics Course	Cold Spring Harbor Laboratory

Postdoctoral Training

Year(s)	Titles	Specialty/Discipline (Lab PI for postdoc research)	Institution
2012 - 2019	Postdoctoral Fellow	Cancer Biology (William G. Kaelin, Jr., M.D.)	Dana-Farber Cancer Institute, Harvard Medical School

Honors and Awards

Year	Name of Honor/Award	Awarding Organization
2002	Valedictorian	North Muskegon High School
2002	President's Gold Scholarship	Baylor University
2002	Robert C. Byrd Honors Scholarship	U.S. Dept. of Education
2006	Phi Beta Kappa	Phi Beta Kappa

2006	Magna Cum Laude	Baylor University
2011	Travel Award	Katten Muchin Rosenman LLP
2014	American Cancer Society Postdoctoral Fellow	American Cancer Society
2017	Career Enhancement Program Award	Dana-Farber/Harvard Cancer Center Brain SPORE
2017	Fellow	Aspen Cancer Conference
2018	Scholar	Cold Spring Harbor Laboratory Young Scholars Symposium
2019	CPRIT Scholar in Cancer Research	Cancer Prevention and Research Institute of Texas
2019	NCI Transition Career Development Award	National Institutes of Health

Faculty Academic Appointments

Year(s)	Academic Title	Department	Academic Institution
2019 - Present	Assistant Professor	Children's Research Institute and Department of Pediatrics	University of Texas Southwestern Medical Center

Other Professional Positions

Year(s)	Position Title	Institution
2019	Consultant	Agios Pharmaceuticals

Committee Service (*Member, unless noted otherwise)*

Year(s)	Name of Committee	Institution/Organization
UTSW		
2020	Attending Neuro-Oncologist Search Committee	UT Southwestern Medical Center
2020	Children's Research Institute Works-in-Progress Seminar Series (Leader)	UT Southwestern Medical Center

Editorial Activities

Year(s)	Journal Name
Ad Hoc Reviewer	
2018 - Present	*Cancer & Metabolism*
2019 - Present	*Cancer Research*
2019 - Present	*Cancers*
2020 - Present	*iScience*

Grant Support

Present	UT Southwestern Circle of Friends
	"Elucidating Mechanisms of Glioma Initiation by IDH1 Mutations"
	Principle Investigator
	$50,000 5/01/2020 – 10/31/2021
	The Jonesville Foundation
	"Creating Mouse Models of Pediatric and Adult Brain Tumors"
	Principle Investigator
	$100,000 04/01/2020 - 03/31/2021
	National Institutes of Health/National Cancer Institute – K22
	"Novel Approaches to Modeling and Treating IDH Mutant Glioma"
	Principle Investigator
	$543,000 09/01/2019 - 08/31/2022
	Cancer Prevention and Research Institute of Texas (CPRIT)
	Recruitment of First-Time, Tenure-Track Faculty Members
	Principle Investigator
	$1,734,000 06/01/2019 - 05/31/2024

Past	National Institutes of Health/National Cancer Institute – P50
	Dana-Farber/Harvard Cancer Center Brain SPORE
	Career Enhancement Program Award
	Principle Investigator
	$25,000 08/01/2017 - 07/31/2018
	American Cancer Society
	"Functional Investigation of (R)-2-hydroxyglutarate Effectors in Glioma"
	Principle Investigator
	$163,500 07/01/2014 - 06/30/2017
	National Institutes of Health/National Cancer Institute – F32 (*declined*)
	"Functional Investigation of (R)-2-hydroxyglutarate Effectors in Glioma"
	Principle Investigator
	$155,346 requested 04/01/2014 – 03/31/2017
	National Institutes of Health/National Cancer Institute – T32
	Northwestern University Carcinogenesis Training Grant

	Trainee
	$50,000 09/01/2008 - 08/31/2010

Teaching Activities

Year(s)	Activity
Medical and graduate school didactic and small group teaching	
2008 - 2012	Graduate and medical student mentor, *Rosen Laboratory*, Feinberg School of Medicine, Northwestern University
2008	Lecturer, *Molecular Mechanisms of Carcinogenesis*, Northwestern University
2010	Lecturer, *Tumor Biology Workshop*, Physical Sciences-Oncology Center, Northwestern University
2013 - 2019	Medical student mentor, *Kaelin Laboratory*, Dana-Farber Cancer Institute, Harvard Medical School
Qualifying examination committees	
2020	Helin Hocaoglu (Genetics, Development & Disease Graduate Program).
Graduate student rotations	
2020	Claudette Fraire (Cancer Biology Graduate Program).
2020	Milan Savani (Medical Scientist Training Program).
2020	Alex Sternisha (Medical Scientist Training Program).
Medical student trainees	
2020	Eric Montgomery (UT Southwestern Medical School). Co-mentored with Ralph DeBerardinis, M.D., Ph.D. Recipient of Dean's Research Scholar Program award.
Postdoctoral trainees	
2020	Yi Xiao (UT Southwestern)

Invited Lectures

Year(s)	Title	Location
International		
2018	*Targeting defective glutamate biosynthesis in IDH-mutant glioma.* Harvard-Heidelberg Science of Neuro-Oncology Symposium, Massachusetts General Hospital	Boston, MA
2019	*Systematic investigation of nitrogen metabolism as a vulnerability in IDH mutant glioma.*	Webinar

	Dana-Farber/Harvard Cancer Center and Seoul National University Brain Tumor Webinar.	
2019	*Metabolic reprogramming by IDH1 mutations in glioma.* Oxygen Sensing, Cancer, and Beyond Symposium. Nobel Forum, Karolinska Institutet	Stockholm, Sweden
National		
2015	*Metabolism and oncogene cooperation in IDH mutant gliomas.* Mid-Winter Brain SPORE Workshop	Houston, TX
2015	*Impairment of branched chain amino acid catabolism and glutamate biosynthesis in IDH mutant glioma.* Metabolic Signaling and Disease: From Cell to Organism Meeting	Cold Spring Harbor, NY
2017	*Metabolic dependencies induced by IDH1 mutation.* Society for Neuro-Oncology Annual Meeting	San Francisco, CA
2018	*BCAT inhibition by 2HG causes glutaminase dependence in IDH1 mutant gliomas during oxidative stress.* Keystone Symposia Tumor Metabolism Meeting	Sandy, UT
2018	*Direct inhibition of BCAT by 2HG impairs glutamate biosynthesis and redox homeostasis in glioma.* Cell Press Symposia: Multifaceted Mitochondria Meeting	San Diego, CA
2018	*New approaches to modeling and treating IDH mutant glioma.* National Brain SPORE Webinar	Webinar
2018	*Development of a CRISPR-based GEM model of glioma driven by the IDH1-R132H oncogene.* Neuro-Oncology Branch Visiting Scholars Program	Bethesda, MD
2018	*Transaminase inhibition by 2-hydroxyglutarate impairs glutamate biosynthesis and redox homeostasis in glioma.* Clinical and Pharmaceutical Solutions through Analysis (CPSA) Annual Symposium	Langhorne, PA
2018	*Transaminase inhibition by 2-hydroxyglutarate impairs glutamate biosynthesis and redox homeostasis in glioma.* Cold Spring Harbor Laboratory Young Scholars Symposium	Cold Spring Harbor, NY

2019	*Engineering genetically faithful mouse models of glioma.* Tango Therapeutics	Boston, MA
Regional/Local		
2011	*Aberrant glucose transporter regulation in multiple myeloma is necessary for metabolic homeostasis.* Tumor Cell Biology Seminar Series, Robert H. Lurie Comprehensive Cancer Center, Northwestern University	Chicago, IL
2011	*GLUT4-dependent glucose metabolism maintains Mcl-1 expression and myeloma viability.* Robert H. Lurie Comprehensive Cancer Center Symposium, Northwestern University	Chicago, IL
2014	*The transaminase BCAT1 is a direct target of 2-hydroxyglutarate.* Colrain Annual Meeting	Harvard, MA
2015	*Metabolism and oncogene cooperation in IDH mutant glioma.* Cancer Program Meeting	Cambridge, MA
2016	*2-hydroxyglutarate impairs branched chain amino acid catabolism and glutathione biosynthesis in IDH mutant glioma.* Neuro-Oncology Seminar Series, Dana-Farber Cancer Institute	Boston, MA
2016	*2-hydroxyglutarate impairs branched chain amino acid catabolism and glutathione biosynthesis in IDH mutant glioma.* HMS Cancer Metabolism Seminar Series, Harvard Medical School	Boston, MA
2017	*Autochthonous tumors driven by Rb1 loss have an ongoing requirement for the RBP2 histone demethylase.* Neuro-Oncology Seminar Series, Dana-Farber Cancer Institute	Boston, MA
2017	*2HG inhibits BCAT and impairs redox homeostasis in IDH1 mutant glioma.* Kaelin Laboratory 25th Anniversary Symposium	Boston, MA
2018	*IDH mutant glioma: new treatments and models.* HMS Cancer Metabolism Seminar Series, Harvard Medical School	Boston, MA

2018	*A novel drug screening platform reveals targetable vulnerabilities induced by the IDH1-R132H oncogene.* Neuro-Oncology Seminar Series, Dana-Farber Cancer Institute	Boston, MA
2019	*New approaches to modeling and treating IDH mutant glioma.* IDH Symposium, Agios Pharmaceuticals	Cambridge, MA
2019	*Systematic investigation of nitrogen metabolism as a vulnerability in IDH mutant glioma.* Brain Lunch Seminar Series, Dana-Farber Cancer Institute	Boston, MA
2019	*New approaches to modeling and treating IDH1 mutant glioma.* Brain Tumor Research Meeting, UT Southwestern Medical Center	Dallas, TX
2019	*Targeting metabolic vulnerabilities in IDH1 mutant glioma.* Hamon Center Lab Conference, UT Southwestern Medical Center	Dallas, TX
2019	*Metabolic reprogramming by IDH1 mutations in glioma.* Genetics, Development & Disease Graduate Program Works-in-Progress Meeting, UT Southwestern Medical Center	Dallas, TX
2019	*New approaches to modeling and treating IDH1 mutant glioma.* Medical Scientist Training Program Works-in-Progress Meeting, UT Southwestern Medical Center	Dallas, TX
2020	*New therapeutic strategies for IDH mutant glioma.* Bass Neurosurgery Symposium, UT Southwestern Medical Center	Dallas, TX
2020	*De novo pyrimidine nucleotide synthesis is a targetable vulnerability in IDH mutant glioma.* CRI Faculty WIPS, UT Southwestern Medical Center	Dallas, TX
2020	*De novo pyrimidine nucleotide synthesis is a targetable vulnerability in IDH mutant glioma.* CNC Program Virtual Retreat, Simmons Comprehensive Cancer Center, UT Southwestern Medical Center	Dallas, TX

Technological and Other Scientific Innovations

Innovation
Shanmugam M, **McBrayer SK**, Rosen ST. (2015). "Use of GLUT4 Inhibitors and DNA Damaging Agents for Treating Multiple Myeloma." US Patent No. US 9,207,243 B2.

Bibliography

Peer-Reviewed Publications

Original Research Articles

1.	Shanmugam M, **McBrayer SK**, Qian J, Raikoff K, Avram MJ, Singhal S, Gandhi V, Schumacker PT, Krett NL, Rosen ST. Targeting Glucose Consumption and Autophagy in Myeloma with the Novel Nucleoside Analogue 8-aminoadenosine. ***Journal of Biological Chemistry***, 2009. 284(39): 26816-30. PMID: 19648108.
2.	**McBrayer SK**, Cheng JC, Singhal S, Krett NL, Rosen ST, Shanmugam M. Multiple Myeloma Exhibits Novel Dependence on GLUT4, GLUT8, and GLUT11: Implications for Glucose Transporter-directed Therapy. ***Blood***, 2012. 119(20): 4686-97. PMID: 22452979.
3.	**McBrayer SK**, Yarrington M, Qian J, Feng G, Shanmugam M, Gandhi V, Krett NL, Rosen ST. Integrative Gene Expression Profiling Reveals G6PD-mediated Resistance to RNA-directed Nucleoside Analogues in B Cell Neoplasms. ***PLOS One***, 2012. 7(7): e41455. PMID: 22848499.
4.	Cheng JC, **McBrayer SK**, Coarfa C, Dalva-Aydemir S, Gunaratne PH, Keats J, Rosen ST, Shanmugam M. Expression and Phosphorylation of the AS160_v2 Splice Variant Supports GLUT4 Activation and the Warburg Effect in Multiple Myeloma. ***Cancer & Metabolism***, 2013. 1:14. PMID: 24280290.
5.	Sarosiek KA, Fraser C, Muthalagu N, Bhola PD, Chang W, **McBrayer SK**, Cantlon A, Fisch S, Golomb-Mello G, Ryan JA, Deng J, Jian B, Corbett C, Goldenberg M, Madsen JR, Liao R, Walsh D, Sedivy J, Murphy DJ, Carrasco DR, Robinson S, Moslehi J, Letai A. Developmental Regulation of Mitochondrial Apoptosis by c-Myc Governs Age- and Tissue-Specific Sensitivity to Cancer Therapeutics. ***Cancer Cell***, 2017. 31(1): 142-156. PMID: 28017613.
6.	Chakraborty AA, Nakamura E, Qi J, Creech A, Jaffe JJ, Paulk J, Nagulapalli K, **McBrayer SK,** Cowley GS, Pineda J, Song J, Wang YE, Carr SA, Root DE, Signoretti S, Bradner JE, Kaelin WG. HIF activation causes synthetic lethality between the VHL tumor suppressor and the EZH1 histone methyltransferase. ***Science Translational Medicine***, 2017. 9(398): eaal5272. PMID: 28701475.
7.	**McBrayer SK**, Olenchock BA, DiNatale GJ, Shi DD, Khanal J, Jennings RB, Novak JS, Oser MG, Robbins AK, Modiste R, Bonal D, Moslehi J, Bronson RT, Neuberg D, Nguyen QD, Signoretti S, Losman JA, Kaelin WG. Autochthonous Tumors Driven by Rb1 Loss Have an Ongoing Requirement for the RBP2 Histone Demethylase. ***Proceedings of the National Academy of Sciences USA***, 2018. 115(16): E3741-E3748. PMID: 29610306.
8.	**McBrayer SK**, Mayers JR, DiNatale GJ, Shi DD, Khanal J, Chakraborty AA, Sarosiek KA, Briggs KJ, Robbins AK, Sewastianik T, Shareef SJ, Olenchock BA, Parker SJ, Tateishi K, Spinelli JB, Islam M, Haigis MC, Looper RE, Ligon KL, Bernstein BE, Carrasco RD, Cahill DP, Asara JM, Metallo CM, Yennawar NH, Vander Heiden MG, Kaelin WG. Transaminase Inhibition by 2-Hydroxyglutarate Impairs Glutamate Biosynthesis and Redox Homeostasis in Glioma. ***Cell***, 2018. 175(1): 101-116. PMID: 30220459.

9.	Badur MG, Muthusamy T, Parker SJ, Ma S, **McBrayer SK**, Cordes T, Magana JH, Guan KL, Metallo CM. Oncogenic R132 IDH1 mutations limit NADPH for de novo lipogenesis through (D)2-hydroxyglutarate production in fibrosarcoma cells. ***Cell Reports***, 2018. 25(4): 1018-1026. PMID: 30355481.
10.	Oser MG, Fonseca R, Chakraborty AA, Brough R, Spektor A, Jennings RB, Flaifel A, Novak JS, Gulati A, Buss E, Younger ST, **McBrayer SK**, Cowley GS, Bonal DM, Nguyen QD, Brulle-Soumare L, Taylor P, Cairo S, Ryan CJ, Pease EJ, Maratea K, Travers J, Root DE, Signoretti S, Pellman D, Ashton S, Lord CJ, Barry ST, Kaelin WG. Cells Lacking the *RB1* Tumor Suppressor Gene are Hyperdependent on Aurora B Kinase for Survival. ***Cancer Discovery***, 2018. 9(2): 230-247. PMID: 30373918.
11.	Koduri V, **McBrayer SK**, Liberzon E, Wang AC, Briggs KJ, Cho H, Kaelin WG. Peptidic Degron for IMiD-Induced Degradation of Heterologous Proteins. ***Proceedings of the National Academy of Sciences USA***, 2019. 116(7): 2539-2544. PMID: 30683719.
12.	Chakraborty AA, Laukka T, Myllykoski M, Ringel AE, Booker MA, Tolstorukov MY, Meng YJ, Meier S, Jennings R, Creech A, Herbert ZT, Spinelli J, **McBrayer SK**, Olenchock BA, Looper RE, Jaffe JD, Haigis M, Beroukhim R, Signoretti S, Koivunen P, Kaelin WG. Histone demethylase KDM6A directly senses oxygen to control chromatin and cell fate. ***Science***, 2019. 363(6432): 1217-1222. PMID: 30872525.
13.	Harris IS, Endress JE, Coloff JL, Selfors LM, **McBrayer SK**, Rosenbluth JM, Takahashi N, Dhakal S, Koduri V, Oser MG, Kang YP, Schauer NJ, Doherty LM, Hong AL, Younger ST, Doench JG, Hahn WC, Buhrlage SJ, DeNicola GM, Kaelin WG, Brugge JS. Deubiquitinases Maintain Protein Homeostasis and Survival of Cancer Cells upon Glutathione Depletion. ***Cell Metabolism***, 2019. 29(5): 1166-1181. PMID: 30799286.
14.	Bajpai R, Sharma A, Achreja A, Edgar CL, Wei C, Siddiqa AA, Gupta VA, Matulis SM, **McBrayer SK**, Mittal A, Rupji M, Barwick BG, Lional S, Nooka AK, Boise LH, Nagrath D, Shanmugam M. ***Nature Communications***, 2020. 11(1): 1228. PMID: 32144272.

Reviews, Chapters, Monographs and Editorials

1.	Shanmugam M, **McBrayer SK**, Rosen ST. Targeting the Warburg Effect in Hematological Malignancies: from PET to Therapy. ***Current Opinion in Oncology***, 2009. 21(6): 531-6. PMID: 19587591.

Proceedings of Meetings

1.	Kane RR, Perera A, Dean DW, **McBrayer SK**, Mourad JB. Spatially-defined modification of fresh tissues using covalent chemistry. Society for Biomaterials 30th Annual Meeting and Exposition, 2005. Memphis, TN.
2.	Kane RR, Perera A, Dean DW, **McBrayer SK**, Mourad JB. Functional protein patterns on fresh tissue. Houston Conference on Biomedical Engineering Research, 2005. Houston, TX.
3.	Shanmugam M, **McBrayer SK**, Krett NL, Rosen ST. Novel purine nucleoside analogue 8-NH_2-Adenosine induces cell death associated with glucose deprivation in myeloma. American Association for Cancer Research Annual Meeting, 2008. San Diego, CA.
4.	Shanmugam M, **McBrayer SK**, Qian J, Raikoff K, Avram MJ, Gandhi V, Schumacker PT, Krett NL, Rosen ST. Targeting glucose consumption and autophagy in myeloma. International Myeloma Workshop, 2009. Washington, D.C.

5.	**McBrayer SK**, Cheng JC, Krett NL, Rosen ST, Shanmugam M. Aberrant plasma membrane localization of GLUT4 sustains the glycolytic phenotype in multiple myeloma. American Association for Cancer Research Annual Meeting, 2011. Orlando, FL.
6.	Cheng JC, **McBrayer SK**, Rosen ST, Shanmugam M. GLUT4-Dependent Glucose metabolism maintains MCL-1 expression and myeloma viability. American Association for Cancer Research: Metabolism and Cancer Meeting, October 2011. Baltimore, MD.
7.	**McBrayer SK**, DiNatale GJJ, Mayers JR, Shi D, Sarosiek KA, Tateishi K, Asara JM, Yennawar NH, Cahill DP, Vander Heiden MG, Kaelin WG. Collateral inhibition of aminotransferases by 2-hydroxyglutarate causes dependence on glutamine metabolism in IDH mutant glioma. Keystone Tumor Metabolism Meeting, 2016. Banff, Alberta, Canada.
8.	**McBrayer SK**, Mayers JR, DiNatale GJJ, Shi D, Sarosiek KA, Briggs KJ, Robbins AK, Olenchock BA, Parker SJ, Tateishi K, Looper RE, Ligon KL, Cahill DP, Asara JM, Metallo CM, Yennawar NH, Vander Heiden MG, Kaelin WG. Direct inhibition of BCAT by 2HG impairs glutamate biosynthesis and redox homeostasis in glioma. Keystone Tumor Metabolism Meeting, 2017. Whistler, British Columbia, Canada.
9.	**McBrayer SK**, Mayers JR, DiNatale GJJ, Shi D, Chakraborty AA, Sarosiek KA, Briggs KJ, Robbins AK, Olenchock BA, Parker SJ, Tateishi K, Looper RE, Ligon KL, Cahill DP, Asara JM, Metallo CM, Yennawar NH, Vander Heiden MG, Kaelin WG. BCAT inhibition by 2HG causes glutaminase dependence in IDH1 mutant glioma during oxidative stress. Keystone Tumor Metabolism Meeting, 2018. Sandy UT.
10.	Kizilbash SH, Burgenske DM, **McBrayer SK**, Devarajan S, Gupta SK, Hitosugi T, He L, Schroeder MA, Carlson BL, Gelman M, Kunos CA, Reid JM, Adjei AA, Sarkaria JN. The addition of CB-839 to temozolomide significantly reduces glioma aspartate and glutamate in an IDH mutated patient derived glioma xenograft model. American Association for Cancer Research Annual Meeting, 2019. Atlanta, GA.
11.	Kizilbash SH, **McBrayer SK**, Port J, Reid JM, Lanza I, Allred JB, Chakravarti A, Kunos C, Adjei AA. A phase Ib trial of CB-839 (telaglenastat) in combination with radiation therapy and temozolomide in patients with IDH-mutated diffuse astrocytoma and anaplastic astrocytoma (NCT03528642). American Society of Clinical Oncology Annual Meeting, 2019. Chicago, IL.