

The Faculty of Medicine of Harvard University
Curriculum Vitae

Date Prepared: April 29, 2024
Name: Lei Xu
Office Address: Massachusetts General Hospital (MGH)
55 Fruit Street, Cox-7
Boston, MA, 02114
Work Phone: 617-726-8051
Work Email: lexu@mgh.harvard.edu

Education:

MD	Medicine	Capital University of Medical Science Beijing, China
PhD	Cancer Biology Thesis advisor: Isaiah J. Fidler	University of Texas, MD Anderson Cancer Center Houston, TX

Postdoctoral Training:

Postdoctoral Fellow	Tumor Biology Mentor: Rakesh K. Jain	Massachusetts General Hospital Boston, MA
---------------------	---	--

Faculty Academic Appointments:

Instructor	Radiation Oncology	Massachusetts General Hospital
Assistant Professor	Radiation Oncology	Massachusetts General Hospital
Associate Professor	Radiation Oncology	Massachusetts General Hospital

Professional Societies

American Association of Cancer Research	Active member
Society of Immunotherapy of Cancer	Member
American Association for the Advancement of Science	Member
Microcirculatory Society	Member

Honors and Prizes:

R.E. Bob Smith Research Fellowship	MD Anderson Cancer Center	Outstanding research in cancer research
Clafin Distinguished Scholar Award	Harvard Medical School	Outstanding research in tumor biology

Report of Funded Projects

Current

- 2022 - 2024 Profile losartan-induced changes in tumor microenvironment and inflammation in NF2 VS patient samples.
Children's Tumor Foundation Clinical Research Award
PI - (\$150,000)
The major goal of this grant is to investigate in NF2 patient samples of the changes induced by losartan treatment.
- 2022 - 2026 Screening trial for pain relief in Schwannomatosis (STARFISH).
Department of Defense Clinical Trial Award
Co-PI - Project PI, Plotkin, Scott (\$1,204,851)
The major goal of this grant is to study the analgesic effect of erenumab-aooe, an FDA-approved CGRP receptor inhibitor, in SWN patients with moderate-to-severe pain.
- 2022 - 2027 Co-targeting IL-6 and EGFR signaling for the treatment of Schwannomatosis and associated pain.
NIH-NINDS R01
PI - (\$2,386,445)
The goal of this grant is to investigate the biology of tumor-induced pain response and develop novel therapeutic strategies to simultaneously control tumor growth and tumor-associated pain in Schwannomatosis models.
- 2023 - 2024 Targeting the Ang II signaling to uncouple the efficacy and toxicity of immunotherapy in NF2.
MGH Executive Committee on Research (ECOR) Interim Support Grant
PI (\$90,000)
This study aims to investigate the efficacy of losartan in enhancing the efficacy and limiting the toxicity of immunotherapy in NF2 mouse models.
- 2023 - 2024 Developing a thrombopoietin inhibitor to treat NF2 hearing loss and schwannoma growth.
Children's Tumor Foundation Drug Discovery Initiative Award
Co-PI - Project PI, Sherman, Lawrence (\$85,000)
The goal of this grant is to test novel thrombopoietin inhibitors in modulating the tumor microenvironment, tumor progression and hearing loss in vestibular schwannoma models.
- 2023 - 2028 Targeting HMGB1 to improve hearing and enhance therapy for NF2 Vestibular Schwannomas.
NIH-NIDCD R01
PI - (\$2,874,318)
The goal of this grant is to investigate the treatment efficacy and mechanisms of blocking HMGB1 in preserving hearing function and controlling tumor growth.
- 2024-2026 Targeting the HIF2 signaling pathway to improve hearing and enhance therapy for NF2 vestibular Schwannomas.
Children's Tumor Foundation
PI - (\$200,000)
The goal of this grant is to investigate the treatment efficacy and mechanisms of blocking HIF2 in preserving hearing function and controlling tumor growth.

2024 - 2026 Reprogramming the tumor microenvironment to enhance immunotherapy in ovarian cancer.
 American Cancer Society Mission Boost Award
 PI - (\$600,000)
 The major goal of this grant is to investigate the effect of modulating the tumor microenvironment on enhancing treatment efficacy in ovarian cancer models.

Training Grants and Mentored Trainee Grants

2023 - 2025 Co-Targeting HMGB1 and EGF signaling for the treatment of NF2 and associated hearing loss.
 Children's Tumor Foundation Young Investigator Award
 Mentor to Zhenzhen Yin, post-doctoral fellow
 The goal of the study is to test combinatory strategy to preserve hearing function in NF2 models.

2023 - 2025 To understand the role of apelin mediated angiogenesis in NF2 associated tumors.
 Children's Tumor Foundation Young Investigator Award
 Co-Mentor to Srirupa Bhattacharyya, post-doctoral fellow
 The goal of the study is to study the functional role of apelin in tumor angiogenesis in NF2 models.

2024 - 2027 Co-Targeting HMGB1 and EGF signaling for the treatment of NF2 and associated hearing loss.
 American Cancer Society Post-Doctoral Award
 Mentor to Zhenzhen Yin, post-doctoral fellow
 The goal of the study is to test combinatory strategy to preserve hearing function in NF2 models.

Report of Clinical Activities and Innovations

Clinical Innovations:

Clinical development of losartan for hearing preservation in patients with NF2. (2021 – Present)	I discovered that blocking angiotensin signaling using losartan preserves hearing function in the NF2 mouse model. Based on our findings, the Department of Radiation Oncology at MGH has amended the current ongoing clinical trial (NCT01199978), to include 10 patients to be treated with losartan concurrently with fractionated proton therapy, with follow-up evaluations for hearing function.
Identification of biomarkers in autism patients. (2021 – Present)	We have identified biomarkers in patients with autism spectrum disorder treated with probiotic and oxytocin combination therapy. This work report the finding of clinical trial (NCT03337035).
Clinical development of screening trial for pain relief in Schwannomatosis. (2023 – Present)	I am the co-PI on clinical trial NCT05684692. I established preclinical models to study mechanisms of tumor-induced pain response and to screen for potential treatment targets. Based on the encouraging initial results, in collaboration with Dr. Scott Plotkin, we initiated the clinical trial testing the analgesic effect of erenumab-aooe, an FDA-approved CGRP receptor inhibitor, in SWN patients with moderate-to-severe pain. I'll be leading the mechanistic and biomarker studies in the trial.

Report of Technological and Other Scientific Innovations

Use of signal transduction inhibitors and combination therapies for the prevention or treatment of cancer and angiogenesis related diseases.

US Patent US-20060036086-A1
(2006)

As a member of the Steele Laboratories for Tumor Biology, my colleagues and I identified and demonstrated the use of signal transduction inhibitors and combination therapies for the prevention or treatment of cancer and angiogenesis-related diseases. The use of these agents has since been used/validated by multiple labs in the US and abroad.

Report of Scholarship

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. Xie, K., Wang, Y., Huang, S., **Xu, L.**, Bielenberg, D., Salas, T., McConkey, D.J., Jiang, W., Fidler, I.J. Nitric oxide-mediated apoptosis of K-1735 melanoma cells is associated with down regulation of Bcl-2. *Oncogene*. 1997; 15(7): 771-9. PMID:9266963
2. Xie, K., Wang, Y.F., Huang, S., **Xu, L.**, Bielenberg, D., Salas, T., McConkey, D.J., Jiang, W., Fidler, I.J. Nitric oxide-mediated apoptosis of K-1735 melanoma cells is associated with down regulation of Bcl-2. *Oncogene*. 1997; 15:771-9. PMID:9266963
3. Xie, K., Bielenberg, D., Huang, S., **Xu, L.**, Salas, T., Juang, S.H., Dong, Z., Fidler, I.J. Abrogation of tumorigenicity and metastasis of murine and human tumor cells by transfection with the murine IFN-beta gene: possible role of nitric oxide. *Clinical Cancer Research*. 1997; 3: 2283-94. PMID:9815626
4. Juang, S.H., Xie, K., **Xu, L.**, Wang, Y., Yoneda, J., Fidler, I.J. Use of retroviral vectors encoding murine inducible nitric oxide synthase gene to suppress tumorigenicity and cancer metastasis of murine melanoma. *Cancer Biotherapy & Radiopharmaceuticals*. 1997; 12: 167-75. PMID:10851463
5. Juang, S.H., Xie, K., **Xu, L.**, Shi, Q., Wang, Y.F., Yoneda, J., Fidler, I.J. Suppression of tumorigenicity and metastasis of human renal carcinoma cells by infection with retroviral vectors harboring the murine inducible nitric oxide synthase gene. *Human Gene Therapy*. 1998; 9:845-54. PMID:9581907
6. **Xu, L.**, Xie, K., Fidler, I.J. Therapy of human ovarian cancer by transfection with the murine Interferon beta gene: role of macrophage-inducible nitric oxide synthase. *Human Gene Therapy*. 1998; 9:2699-27-8. PMID:9874268
7. **Xu, L.**, Xie, K., Mukaida, N., Matsushima, K., Fidler, I.J. Hypoxia-induced elevation in Interleukin-8 expression by human ovarian carcinoma cells. *Cancer Research*. 1999; 59(22): 5822-9. PMID:10582705
8. Fidler, I.J., Singh, R.K., Yoneda, J., Kumar, R., **Xu, L.**, Dong, Z., Bielenberg, D.R., McCarty, M., Ellis, L.M. Critical determinants of neoplastic angiogenesis. *The Cancer Journal* 2000; 6 (supl 3): S225-S236. PMID: 10874492
9. **Xu, L.**, Fidler, I.J. Interleukin 8: An autocrine growth factor for human ovarian cancer. *Oncology Research*. 2000; 12:97-106. PMID:11132928
10. **Xu, L.**, Yoneda, J., Herrera, C., Wood, J., Killian, J.J., Fidler, I.J. Inhibition of malignant ascites and growth of human ovarian carcinoma by oral administration of a potent inhibitor of the vascular

- endothelial growth factor receptor tyrosine kinases. *International Journal of Oncology*. 2000; 16(3): 445-54. PMID:10675474
11. **Xu, L.**, Fidler, I.J. Acidic pH-induced elevation in Interleukin-8 expression by human ovarian carcinoma cells. *Cancer Research*. 2000; 60: 4610-6. PMID 10969814
 12. Fidler, I.J., Bielenberg, D.R., Slaton, J., **Xu, L.**, Dinney, C.P.N., Dong, Z. Interferon-mediated antiangiogenic therapy. *Journal of National Cancer Institute* 2000; 1092: 4-12
 13. Brown, E.B., Campbell, R.B., Tsuzuki, Y., **Xu, L.**, Carmeliet, P., Fukumura, D., Jain, R.K. *In vivo* measurement of gene expression, angiogenesis and physiological function in tumors using multiphoton laser scanning microscopy. *Nature Medicine*. 2001; 7(7): 864-8. PMID:11433354
 14. Tsuzuki, Y., Carreira, C.M., **Xu, L.**, Jain, R.K., Fukumura, D. Pancreas microenvironment promotes VEGF expression and tumor growth: novel window model for pancreas tumor angiogenesis and microcirculation. *Laboratory Investigation*. 2001; 81(10): 1439-51. PMID:11598156
 15. Fukumura, D., **Xu, L.**, Chen, Y., Gohongi, T., Seed, B., Jain, R.K. Hypoxia and acidosis independently up-regulate vascular endothelial growth factor transcription in brain tumors *in vivo*. *Cancer Research*. 2001; 61(16): 6020-24. PMID:11507045
 16. **Xu, L.**, Fukumura, D., Jain, R.K. Acidic extracellular pH induces VEGF in human glioblastoma cells via AP-1 and requires ERK1/2 MAPK. *Journal of Biological Chemistry*. 2002; 277 (13): 11368-74. PMID:11741977
 17. Herrera, C.A., **Xu, L.**, Bucana, C.D., Silva, E.G., Hess, K.R., Gershenson, D.M., Fidler, I.J. Expression of metastasis-related genes in human epithelial ovarian tumors. *International Journal of Oncology*. 2002; 20(1): 5-13. PMID: 11907566
 18. Izumi, Y., **Xu, L.**, di Tomaso, E., Fukumura, D., Jain, R.K. Tumour biology: herceptin acts an anti-angiogenic cocktail. *Nature*. 2002; 416:279-80. PMID: 11907566
 19. Fidler, I.J., Yoneda, J., Herrera, C., Wood, J., **Xu, L.** Specific Keynote: Molecular determinants of angiogenesis in ovarian cancer. *Gynecologic Oncology* 2003; 88: S29-S36. PMID:12586082
 20. Fukumura, D., Ushiyama, A., Duda, D.G., **Xu, L.**, Chatterjee, V.K.K., Garkavtsev, I., Jain, R.K. Paracrine regulation of angiogenesis and adipocyte differentiation during adipogenesis *in vivo*. *Circulation Research*. 2003; 93(9): e88-97. PMID:14525808
 21. Bockhorn, M., Tsuzuki, Y., **Xu, L.**, Frilling, A., Broelsch, C.E., Fukumura, D. Differential vascular and transcriptional responses to anti-vascular endothelial growth factor antibody in orthotopic human pancreatic cancer xenografts. *Clinical Cancer Research*. 2003; 9 (11): 4221-4226. PMID:14519649
 22. Garkavtsev, I., Kozin, S., Chernova, O., **Xu, L.**, Winkler, F., Brown, E., Barnett, G.H., and Jain, R.K. The candidate tumour suppressor protein ING4 regulates brain tumour growth and angiogenesis. *Nature Medicine*. 2004; 428(6980): 328-32. PMID:15029197
 23. Winkler, F., Kozin, S.V., Tong, R.T., Chae, S.S., Booth, M.F., Garkavtsev, I., **Xu, L.**, Hicklin, D. J., Fukumura, D., di Tomaso, E., Munn, L.L., and Jain, R.K. Kinetics of vascular normalization by VEGFR2 blockade governs brain tumor response to radiation: role of oxygenation, angiopoietin-1, and matrix metalloproteinases. *Cancer Cell*. 2004; 6(6): 553-63

24. **Xu, L.**, Pathak, P.S., Fukumura, D. Hypoxia-induced activation of p38 MAPK and PI3K signaling pathways contributes to expression of Interleukin-8 in human ovarian carcinoma cells. *Clinical Cancer Research*. 2004; 10(2): 701-7. PMID:14760093
25. **Xu, L.***, Tong R., Cochran, D.M., and Jain, R.K. Blocking platelet-derived growth factor-D/platelet-derived growth factor receptor beta signaling inhibits human renal cell carcinoma progression in an orthotopic mouse model. *Cancer Research*. 2005; 65 (13): 5711-9. PMID:15607960. *Corresponding author.
26. Kashiwagi, S., Izumi, Y., Gohongi, T., Demou, Z.N., **Xu, L.**, Huang, P.L., Buerk, D.G., Munn, L.L., Jain, R.K., and Fukumura, D. NO mediates mural cell recruitment and vessel morphogenesis in murine melanomas and tissue-engineered blood vessels. *Journal of Clinical Investigation*. 2005; 115(7): 1816-27. PMID:15951843
27. Hagendoorn, J., Tong R., Fukumura D., Lin Q., Lobo J., Padera T.P., **Xu L.**, Kucherlapati R., Jain R.K. Onset of abnormal blood and lymphatic vessel function and interstitial hypertension in early stages of carcinogenesis. *Cancer Research*. 2006; 66(7): 3360-4. PMID:16585153
28. **Xu, L.***, Cochran, D.M., Tong, R.T., Winkler, F., Kashiwagi, S., Jain, R.K., and Fukumura, D. PIGF overexpression inhibits tumor growth, angiogenesis and metastasis by depleting VEGF homodimers in orthotopic mouse models. *Cancer Research*. 2006; 66(8): 3971-7. PMID:16618713. *Corresponding author.
29. Lawenda, B.D., Smith D.E., **Xu, L.**, Niemierko, A., Silverstein, J.R., Boucher, Y., Kashiwagi, S., Held, K.D., Jain R.K., Loeffler, J.S., Eisenberg D.M., Blumberg. J.B. Do the dietary supplements epigallocatechin gallate or vitamin e cause a radiomodifying response on tumors in vivo? A pilot study with murine breast carcinoma. *Journal of the Society Integrative Oncology*. 2007; 5(1): 11-7. PMID:17309809
30. **Xu, L.**, Jain, R.K. Downregulation of PIGF by promoter hypermethylation in human lung and colon carcinoma. *Molecular Cancer Research*. 2007; 5(9): 873-80. PMID:17704140
31. Kashiwagi, S., Tsukada, K., **Xu, L.**, Miyazaki, J., Kozin, S.V., Tyrrell, J.A., Sessa, W.C., Gerweck, L.E., Jain, R.K., Fukumura, D. Perivascular nitric oxide gradients normalize tumor vasculature. *Nature Medicine*. 2008; 14(3): 255-7. PMID:18278052
32. **Xu, L.**, Duda, DG., di Tomaso, E., Ancukiewicz, M., Chung, DC., Lauwers, GY., Samuel, R., Shellito, P., Czito, BG., Lin, PC., Poleski, M., Bentley, R., Clark, JW., Willett, CG., Jain, RK. Direct evidence that Bevacizumab, an anti-Vascular Endothelial Growth Factor antibody, upregulates SDF-1a, CXCR4, CXCL6, and Neuropilin 1 in tumors from patients with Rectal cancer. *Cancer Research*. 2009. 69(20): 7905-10. PMID: 19826039
33. **Xu, L.***, Czito, BG., Willett, CG. Epigenetic markers in rectal cancer. *Clinical Cancer Research*. 2010. 16(10):2699-701. PMID: 24060492. *Corresponding author.
34. Gerstner, E.R., Eichler, A.F., Plotkin, S.R., Drappatz, J., Doyle, C.L., **Xu, L.**, Duda, D.G., Wen, P.Y., Jain, R.K. and Batchelor, T.T. Phase I trial with biomarker studies of vatalanib (PTK787) in patients with newly diagnosed glioblastoma treated with enzyme inducing anti-epileptic drugs and standard radiation and temozolomide. *J. Neuro-Oncology*. 2011. 103(2):325-32. PMID: 20821342
35. Liao, S., Liu, JQ., Lin, P., Shi, T., Jain, RK., **Xu, L.** TGF-beta blockade controls ascites by preventing abnormalization of lymphatic vessels in orthotopic human ovarian carcinoma model. *Clinical Cancer Research*. 2011. 17(6):1415-24. PMID: 21278244.

Figure from the paper featured as journal cover.

36. Liu, JQ., Liao, S., Huang, YH., Samuel, R., Shi, T., Naxerova, K., Huang, P., Kamoun, W., Jain, RK., Fukumura, D. and **Xu, L.** PDGF-D improves drug delivery and efficacy via vascular normalization, but promotes lymphatic metastasis by activating CXCR4 in breast cancer. *Clinical Cancer Research*. 2011. 17(11):3638-48. PMID: 21459800
37. Duda, D.G., Kozin, S.V., Kirkpatrick, N.D., **Xu, L.**, Fukumura, D., Jain, R.K. CXCL12(SDF1a)-CXCR4/CXCR7 pathway inhibition: an emerging sensitizer for anti-cancer therapies? *Clinical Cancer Research*. 2011. 17(8): 2074-80. PMID:21349998
38. Liu, J. Liao, S. Diop-Frimpong, B., Chen, W., Goel, S., Naxerova, K., Ancukiewicz, M., Boucher, Y., Jain, R.K., **Xu, L.** TGF-beta blockade improves the distribution and efficacy of therapeutics in breast carcinoma by normalizing the tumor stroma. *Proceedings of National Academy of Science USA*. 2012. 109(41): 16618-23. PMID: 22996328
39. Snuderl, M., Batista, A., Kirkpatrick, N.D., de Almodovar, C.R., Riedemann, L., Walsh, E.C., Anolik, R., Huang, Y., Martin, J.D., Kamoun, W., Knevels, E., Schmidt, T., Farrar, C.T., Vakoc, B.J., Mohan, N., Chung, E., Roberge, S., Peterson, T., Bais, C., Zhelyazkova, B.H., Yip, S., Hasselblatt, M., Rossig, C., Niemeyer, E., Ferrara, N., Klagsbrun, M., Duda, D.G., Fukumura, D., **Xu, L.**, Carmeliet, P., and Jain, R.K. Placental growth factor/neuropilin 1 signaling is a therapeutic target in pediatric medulloblastoma. *Cell*. 2013. 152(5):1065-76. PMID: 23452854
40. Datta, M., Via, L.E., Kamoun, W.S., Liu, C., Chen, W., Seano, G., Weiner, D.M., Schimel, D., England, K., Martin, J.D., Gao, X., **Xu, L.**, Barry 3rd, C.E., Jain, R.K. Anti-vascular endothelial growth factor treatment normalizes tuberculosis granuloma vasculature and improves small molecule delivery. *Proceedings of National Academy of Science USA* 2015. 112 (6):1827-32. PMID: 25624495
41. Gao X, Zhao Y, Stemmer-Rachamimov AO, Liu H, Huang P, Chin S, Selig MK, Plotkin SR, Jain RK, **Xu L.** Anti-VEGF treatment improves neurological function and augments radiation response in NF2 schwannoma model. *Proceedings of National Academy of Science USA*. 2015.112(47):14676-81. PMID: 26554010.
- Featured on DoD website.*
42. Datta M, Via LE, Chen W, Baish JW, **Xu L**, Barry CE 3rd, Jain RK. Mathematical Model of Oxygen Transport in Tuberculosis Granulomas. *Ann Biomedical Engineer*. 2016. 44(4):863-72. PMID: 26253038
43. Zhang, L., Gao, X., Zhao, Y., Datta, M., Liu, P., **Xu, L.** Rationally combining anti-VEGF therapy with radiation in NF2 schwannoma. *Journal of Rare Diseases Research and Treatment*. 2016. 1(2): 51-55. PMID: 28191549
44. J. Kloepper, L. Riedemann, Z. Amoozgar, G. Seano, K. H. Susek, V. Yu, N. Dalvie, R. L. Amelung, M. Datta, J. W. Song, V. Askoxylakis, J. W. Taylor, C. LuEmerson, A. Batista, N. D. Kirkpatrick, K. Jung, M. Snuderl, A. Muzikansky, K. G. Stubenrauch, O. Krieter, H. Wakimoto, L. **Xu, L.** Munn, L. D. G. Duda, D. Fukumura, T. T. Batchelor, and R. K. Jain. Ang2/VEGF bispecific antibody reprograms macrophages and resident microglia to antitumor phenotype and prolongs glioblastoma survival. *Proceedings of National Academy of Science USA*. 2016; 113 (16):4476-81. PMID: 27044098
45. T. E. Peterson, N. D. Kirkpatrick, Y. Huang, C. T. Farrar, K. Marijt, J. Kloepper, M. Datta, Z. Amoozgar, G. Seano, K. Jung, W. S. Kamoun, T. Vardam, M. Snuderl, J. Goveia, S. Chatterjee, A. Muzikansky, C. C. Leow, **Xu, L.** T. T. Batchelor, D. G. Duda, D. Fukumura, and R. K. Jain. Dual inhibition of Ang2 and VEGF receptors normalizes tumor vasculature and prolongs survival

in glioblastoma by altering macrophages. *Proceedings of National Academy of Science USA*. 2016; 113(16):4470-5. PMID: 27044097

46. Zhao F, Ohgaki H, **Xu L**, Giangaspero F, Chunde L, Li P, Yang Z, Wang B, Wang X, Wang Z, Ai L, Zhang J, Luo L, Liu P. Molecular subgroups of adult medulloblastoma: a long-term single-institution study. *Neuro-Oncology*. 2016. 18(7):982-90. PMID:27106407
47. Zhang N, Chen J, Ferraro G, Wu L, Datta M, Jain RK, Plotkin SR, Stemmer-Rachamimov. A, **Xu, L**. AntiVEGF treatment improves neurological function in tumors of the nervous system. *Experimental Neurology* 2018. 299(PtB):326-333. PMID: 28911884
48. Zhao Y, Liu P, Zhang N, Chen J, Landegger LD, Wu L, Zhao F, Zhao Y, Zhang J, Fujita T, Stemmer-Rachamimov A, Ferraro GB, Liu H, Muzikansky A, Plotkin SR, Stankovic KM, Jain RK, **Xu L**. Targeting the cMET pathway augments radiation response without adverse effect on hearing in NF2 schwannoma models. *Proceedings of National Academy of Science. USA*. 2018. 115(9): E2077-E2084. PMID:29440379.

Featured on HMS website.

49. Zhao, Y., Cao, J., Melamed, A., Worley, M., Gockley, A., Jones, D., Nia, H.T., Zhang, Y., Stylianopoulos, T., Kumar, A.S., Mpekris, F., Datta, M., Sun, Y., Wu, L., Gao, X., Yeku, O., del Carmen, M., Spriggs, D.R., Jain, R.K., and **Xu, L**. Losartan treatment enhances chemotherapy efficacy and reduces ascites in ovarian cancer models by normalizing the tumor stroma. *Proceedings of National Academy of Science USA*. 2019; 116(6):2210-2219. PMID:30659155.

Featured on HMS website.

50. Landegger, LD, Vasilijic, S, Fujita, T, Soares, V, Seist, R, **Xu, L** and Stankovic, KM. Cytokine levels in inner ear fluid of young and aged mice as molecular biomarkers of noise-induced hearing loss. *Frontiers in Neurology*. 2019, 11: 977. PMID: 31632328
51. Sagers JE, Beauchamp RL, Zhang Y, Vasilijic S, Wu L, DeSouza P, Seist R, Zhou W, **Xu L**, Ramesh V, Stankovic KM. Combination therapy mTOR kinase inhibitor and dasatinib as a novel therapeutic strategy for vestibular schwannoma. *Scientific Reports*. 2020. 10(1):4211. PMID:32144278
52. Amoozgar, Z., Kloepper, J., Ren, J., Tay, R.E. Kazer, S.W., Kiner, E., Krishnan, S., Posada, J.M., Ghosh, M., Mamessier, E., Wong, C., Ferraro, G.B., Batista, A., Wang, N., Badeaux, M., Roberge, S., **Xu, L.**, Huang, P., Shalek, A.K., Fukumura, D., Kim, H.J., Jain, R.K. Targeting Treg cells with GITR activation alleviates resistance to immunotherapy in murine glioblastomas. *Nature Communication*. 2021, 12(1):2582. PMID: 33976133
53. Wu, L., Vasilijic, S., Sun, Y., Chen, J., Landegger, L.D., Zhang, Y., Zhou, W., Ren, J., Early, S., Yin, Z., Ho, W.W., Zhang, N., Gao, X., Lee, G.Y., Datta, M., Sagers, J.E., Brown, A., Muzikansky, A., Stemmer-Rachamimov, A., Zhang, L., Plotkin, S.R., Jain, R.K., Stankovic, K.M., and **Xu, L**. Losartan prevents tumor-induced hearing loss and augments radiation efficacy by normalizing the tumor microenvironment in NF2 schwannoma. *Science Translational Medicine*. 2021, 13(602):eabd4816. PMID: 34261799.

Figure from the paper featured as an online rotator for the journal, and the study is featured on HMS and DoD website.

54. Kong XJ, Liu J, Liu K, Koh M, Sherman H, Liu S, Tian R, Sukijthamapan P, Wan J, Fong M, **Xu L**, Clairmont C, Jeong M, Li A, Lopes M, Hgan V, Dutton T, Chan ST, Lee H, Kendall A, Kwong K, Song Y. Probiotic and oxytocin combination therapy in patients with autism spectrum

- disorder: a randomized double-blinded placebo-controlled pilot trial. *Nutrients*. 2021, 13(5): 1522. PMID: 32082606
55. Ho, W.W., Gomes-Santos, I.L., Aoki, S., Datta, M., Kawaguchi, K., Talele, N.P., Roberge, S., Ren, J., Liu, H., Chen, I.X., Andersson, P., Chatterjee, S., Kumar, A.S., Amoozgar, Z., Zhang, Q., Huang, P., Ng, M.R., Chauhan, V.P., **Xu, L.**, Duda, D.G., Clark, J.W., Pittet, M.J., Fukumura, D., Jain, R.K. Dendritic cell paucity in mismatch repair-proficient colorectal cancer liver metastases limits immune checkpoint blockade efficacy. *Proceedings of National Academy of Science. USA*. 2021, 118 (45):e2105323118. PMID:34725151
 56. Zhao, F., Chen, Y., Li, S., Zhang, J., Zhang, S., Zhao, X., Wang, L., Yang, Z., Wang, B., He, Q., **Xu, L.**, Liu, P., Novel patient-derived xenograft and cell line models for therapeutic screening in NF2-associated Schwannoma. *Journal of Pathology*. 2022, 257(5):620-634. PMID: 35394061
 57. Da, J.L.W., Merker, V.L., Jordan, J.T., Ly, K.I., Muzikansky, A., Parsons, M., Wolters, P.L., **Xu, L.**, Styren, S., Brown, M.T., Plotkin, S.R. Design of a randomized, placebo-controlled, phase 2 study evaluating the safety and efficacy of tanezumab for treatment of schwannomatosis-related pain. *Contemporary Clinical Trials*. 2022, 121:106900. PMID: 36038003
 58. Datta, M. Chatterjee, S., Perez, E.M., Gritsch, S., Roberge, S., Duquette, M., Chen, I.X., Naxerova, K., Kuman, A.S., Ghosh, M., Emblem, K.E., Ng, M.R., Ho, W.W., Kumar, P., Krishnan, S., Dong, X., Speranza, M.C., Neagu, M.R., Iorgulescu, J., Huang R.Y., Youssef, G., Reardon, D.A., Sharpe, A.H., Freeman, G.J., Suva, M.L., **Xu, L.**, Jain, R.K. Losartan controls immune checkpoint block-induced edema and improves survival in glioblastoma mouse models. *Proceedings of National Academy of Science. USA*. 2023, 120(6):e2219199120. PMID: 36724255
 59. Bhattacharyya, S, Oblinger, JL, Beauchamp RL, Yin Z, Erdin S, Koudinya P, Ware AD, Ferrer M, Jordan JT, Plotkin SR, **Xu L**, Chang LS, Ramesh V. Proteasomal pathway inhibition as a potential therapy for NF2-associated meningioma and schwannoma. *Neuro-Oncology*. 2023, noad037. PMID: 36806881
 60. Datta, M., Kennedy, M., Siri, S., Via, LE., Baish, JW., **Xu, L.**, Dartois, V., Barry, CE., Jain, RK. Mathematical Model of Oxygen, Nutrient, and Drug Transport in Tuberculosis Granulomas. Plos Computational Biology. In print.

Other peer-reviewed scholarship

60. Jain, R.K., **Xu, L.** alphaPIGF: a new kid on the antiangiogenesis block. *Cell*. 2007; 131(3):443-5. PMID: 17981110
61. Goel, S., Duda, D.G., **Xu, L.**, Munn, L.L., Boucher, Y., Fukumura, D., Jain, R.K. Normalization of the vasculature for treatment of cancer and other diseases. *Physiology Review*. 2011. 91(3): 1071-121. PMID: 21742796
62. Askoxylakis V, Badeaux M, Roberge S, Batista A, Kirkpatrick N, Snuderl M, Amoozgar Z, Seano G, Ferraro GB, Chatterjee S, **Xu L**, Fukumura D, Duda DG, Jain RK. A cerebellar window for intravital imaging of normal and disease states in mice. *Nature Protocol*. 2017. 12(11):2251-2262. PMID: 28981123
63. Chen J, Landegger LD, Sun Y, Ren J, Maimon N, Wu L, Ng MR, Chen JW, Zhang N, Zhao Y, Gao X, Fujita T, Roberge S, Huang P, Jain RK, Plotkin SR, Stankovic KM, **Xu L.** A cerebellopontine angle mouse model for the investigation of tumor biology, hearing, and neurological function in NF2-related vestibular schwannoma. *Nature Protocol*. 2019. 14(2):541-555. PMID: 30617350

Non-peer reviewed scholarship in print or other media:

Reviews, chapters, and editorials

64. Jain, R.K., **Xu, L.** alphaPIGF: a new kid on the antiangiogenesis block. *Cell*. 2007; 131(3):443-5. PMID: 17981110

Books/textbooks for the medical or scientific community

65. Gao, X., Wu, L., Thalheimer, R.D., Chen, J., Sun, Y., Lee, G.Y., Plotkin, S.R., **Xu, L.** Assessing neurological function in brain tumor mouse model. *Brain Tumors*, Neuromethods, Springer, New York, NY. 2021. v158, 199-220.

Manuscripts Submitted to Preprint Servers

67. Yin Z, Wu L, Zhang Y, Sun Y, Chen JW, Subudhi S, Ho W, Lee GY, Wang A, Gao X, Ren J, Zhu C, Zhang N, Ferraro GB, Muzikansky A, Zhang L, Stemmer-Rachamimov, Mao J, Plotkin SR, **Xu L.** Co-Targeting IL-6 and EGFR signaling for the treatment of schwannomatosis and associated pain. *BioRxiv*. 2023 March. doi: <https://doi.org/10.1101/2023.02.06.527377>. Invited for re-submission by *Science Translational Medicine*.
68. Sun Y, Yin Z, Wu L, Yue C, Zhang Y, Subudhi S, Lei P, Muzikansky A, Zhang L, Rueda BR, Jain RK, **Xu L.** Losartan rewires ovarian cancer tumor-immune microenvironment and suppresses IGF-1 to amplify chemo-immunotherapy sensitivity. *bioRxiv*. 2023 Sept <http://doi.org/10.1101/2023.08.31.555783>. Currently under review by *British Journal of Cancer*.