Mary L. Alpaugh

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Molecular & Cellular Biosciences

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Education:
BS (Biology & Philosophy), King's College
PhD (Biochemical & Biophysical Sciences), University of Houston
Postdoctoral (Pathology), University of California, Los Angeles

Research Expertise:
Cancer Biology | Tumor Progression | Metastasis | Intravasation

My research focuses predominantly on the molecular mechanisms of intravasation, the rate-limiting step of metastasis, and resistance/susceptibility of lymphovascular emboli to therapeutics.

Metastasis poses the single most difficult clinical challenge in the attempt to manage and treat cancer. In this effort, I have established patient-derived xenografts, signifcantly the first (and only) human transplantable inflammatory breast cancer xenograft, called MARY-X. Inflammatory breast cancer (IBC) is one of the most aggressive types of breast cancer; nearly 100% of all women with IBC have lymph node involvement and 25% have distant metastases upon diagnosis. The signature phenotype of IBC is florid lymphovascular invasion of cancer emboli. Whereas most human xenografts grow as a subcutaneous confluent cellular mass, MARY-X grows exclusively in the murine lymphatic and blood vessels, recapitulating the phenotype displayed in human IBC and in essence providing both a preclinical IBC model and a relevant model of metastasis. MARY-X, in vitro, is a primary cellular derivative from tumor explants. These tumor cells spontaneously form tight, compact aggregates of cells termed "MARY-X spheroids". Comparable to human IBC emboli, a persistent, over-expression of an intact E-cadherin/α, β-catenin axis mediates the compaction of both in vitro and in vivo MARY-X spheroids and tumor emboli, respectively. The in vitro MARY-X spheroid has comparative 3-dimensional (3-D) architectural/pathophysiological features to the lymphovascular embolus. Therefore MARY-X provides a relevant 3D in vitro analysis platform for drug design and development of IBC and metastatic disease i.e. the lymphovascular embolus.

Member of:
American Association for Cancer Research

Recent Publications:

Thorek DLJ, Watson PA, Lee S-G, Ku AT, Bournazos S, Braun K, Kim K, Sjöstrŏm K, Doran MG, Lamminmăki U, Santos E, Veach D, Turkekul M, Casey E, Lewis JS, Abou DS, van Voss MRH, Scardino PT, Strand S-E, Alpaugh ML, Scher HI, Lilja H, Larson SM, Ulmert D (2016) Internalization of secreted antigen targeted antibodies by the neonatal Fc receptor for precision imaging of the androgen receptor axis. Science Translational Medicine. In press.

Putcha P, Yu J, Rodriguez-Barrueco R, Saucedo-Cuevas L, Villagrasa P, Murga-Penas E, Quayle SN, Yang M, Castro V, Llobet-Navas D, Birnbaum D, Finetti P, Woodward WA, Bertucci F, Alpaugh ML*, Califano A,* Silva J* (2015) HDAC6 activity is a non-oncogene addiction hub for inflammatory breast cancer. Breast Cancer Research 17:149.

Theodoraki MA, Rezende Jr CO, Chantarasriwong O, Corben AD, Theodorakis EA, Alpaugh ML (2015) Spontaneously-forming spheroids as an in vitro cancer cell model for anticancer drug screening. Oncotarget 6:21255-67.

Corben AD, Uddin MM, Crawford B, Farooq M, Modi S, Gerecitano J, Chiosis G, Alpaugh ML (2014) Ex vivo Treatment Response of Primary Tumors and/or Associated Metastases for Preclinical and Clinical Development of Therapeutics. J Vis Exp (92):e52157.