



Three-dimensional tumor model as a robust platform for in vivo testing of cancer therapies

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Abstract:

Despite major investments and research in the field of nanomedicine, there have been few nanocarriers that saw therapeutic success in clinical settings. The difference outcomes in patients has been assigned to the tumor pathophysiology, which is also a function of blood vasculature and varies across clinical tumor types. The routine tumor models in mice wherein single cells are injected en masse (monolayer grown 2D cells) do not emulate the growth of naturally occurring tumors. In our current work, we developed robust mice 3D spheroid model by implantation of pre-formed mini-tumors in contrast to the routinely used 2D model. As representatives of drug, nanoparticle and antibody treatments we chose- Doxorubicin, Doxil and Avastin to test on the two models. To elucidate the difference in response to the treatments, we characterized the two tumor models and established that they differed characteristically with respect to blood vasculature (Endothelial cells) and stroma (Myofibroblasts) and the ensuing tumor microenvironment (TME) dynamics.

Biography:

Manu Smriti Singh has research experience in the field of cancer nanomedicine for over 10 years. she was column writer in India's first magazine Nanodigest summarizing latest Nanomedicine Updates. She is a recipient of DBT (Department of Biotechnology) Fellowship during Master's in Biotechnology. In April 2010- First World Conference on Nanomedicine and Drug delivery. Kottayam,



India. Won 3rd position in poster presentation. She is awarded with PhD Fellowship by NRW International Graduate School of BIOTECH-PHARMA in Bonn, Germany.

Publication of speakers:

1. Nanoparticle mediated co-delivery of paclitaxel and a TLR-4 agonist results in tumor regression and enhanced immune response in the tumor microenvironment of a mouse model; A Roy, MS Singh, P Upadhyay, S Bhaskar.
2. Combined chemo-immunotherapy as a prospective strategy to combat cancer: a nanoparticle based approach; A Roy, MS Singh, P Upadhyay, S Bhaskar.
3. RNA nanomedicines: the next generation drugs?; MS Singh, D Peer
4. Cargoing Pgp inhibitors via nanoparticle sensitizes tumor cells against doxorubicin; MS Singh, A Lamprecht
5. MDR in cancer: addressing the underlying cellular alterations with the use of nanocarriers; AL MS Singh, S Tamam, MS Boushehri

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