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When defense becomes attack: Role of mucins in ovarian cancer

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The ovarian cancer fatality-to-case ratio remains exceedingly high. More than 60% of the patients experience disease recurrence with discouraging response rates of 20%. Current research for early detection of ovarian cancer largely focuses on biomarker discovery, and the most studied marker for ovarian cancer is CA125, a transmembrane mucin-like glycoprotein, that is overexpressed by tumor cells and binds to mesothelin. Transmembrane mucins are abundantly expressed at the apical surfaces of normal epithelial cells where they play important roles in lubricating and protecting tissues from endogenous and exogenous aggressions. However, mucin apical polarization is lost in adenocarcinomas and high-level mucin expression protects tumor cells against cell death and chemotherapeutics. This lecture will provide a comprehensive review of the structure of transmembrane mucins such as CA125, MUC1 and MUC4, address their function during the anti-tumor immune response, and discuss ensuing novel therapeutic strategies.

Biography

Nathalie Scholler is Assistant Professor of Ob/Gyn, University of Pennsylvania. She holds an M.D. from the Faculty of Medicine of Marseille and a Ph.D. in Immunology from the University of Aix-Marseille II, France. She discovered that mesothelin is a soluble marker for ovarian cancer and developed a mesothelin ELISA assay now commercialized by Fujirebio, Inc as Mesomark™. She also engineered yeast-secreted recombinant antibodies that are site-specifically biotinylated *in vivo*, for immune and functional assays *in vitro* and for *in vivo* targeting.

State of the art of non-invasive stereo-device guided brain lesion ablation with high-dose high-energy photon beams

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Non-invasive cranial surgery with high-energy high-precision focal photon beams has evolved to become the treatment of choice for many brain tumors as well as functional disorders. Currently there are several treatment modalities utilizing different paradigms to deliver a high dose of tumorcidal radiation or neuromodulating radiation to a region of interest. Multi-institution randomized clinical trials have also initiated to apply such a technique for treating multiple brain tumors as well as complex disease such as epilepsy. Demands on high efficient and high precision treatments have grown quickly over the past five years. To meet such a challenge, we have proposed a new treatment delivery mechanism by taking advantage of the latest robotic automatic patient positioning technology and the fast beam fluence modulation mechanism to achieve better sculpting of a large number of radiation beams to treat complex brain tumors including a high number (such as 20) of brain metastasis. We have developed a prototype system and investigated the precision and the quality of the new approach against the existing treatment modalities. Our results have shown that the new technique provided equal or better outcome with a significantly shortened treatment delivery time. The development of such a technology in the backdrop of the existing treatment modalities for multiple brain tumor treatments will be discussed.

Biography

Lijun M. A completed his Ph.D. in Radiation Physics from University of North Carolina at Chapel Hill and his subsequent postdoctoral studies from Stanford University School of Medicine. He is Professor in residence at University of California San Francisco School of Medicine and currently serving as Board member of International Stereotactic Radiosurgical Society, a leading international professional society on applying high-energy photon beams for brain lesion treatments. He has published more than 100 papers and book chapters in reputed journals and has served on multiple scientific review panels for federal and state government agencies.

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