Nanotechnology Characterization Laboratory

NCL
Nanotechnology
Characterization
Laboratory

May 2018

Each quarter the NCL accepts the most promising cancer nanomedicine candidates into its Assay Cascade characterization and testing program. Nanomedicines accepted into the program will undergo a rigorous evaluation that may include sterility and endotoxin testing, physicochemical characterization, in vitro hemato- and immunotoxicity, and in vivo studies to evaluate safety, efficacy and pharmacokinetics. The studies are tailored to each individual nanomedicine and are designed to promote the clinical translation of these novel therapies. **All studies are conducted free of charge for Awardees**.

Congratulations to this Quarter's Awardees

Raag Airan, Stanford University

A gross total resection of a brain tumor gives the best chances for positive outcomes for patients. For tumor resection, a map of the location of the critical functional brain regions, like language centers, is needed to ensure that the surgery would maximize tumor resection while minimizing the potential functional deficits. To help create such a map, Dr. Airan and colleagues have created polymeric perfluorocarbon nanoemulsions that release the anesthetic propofol upon the application of focused ultrasound, and have validated in rats that this system could be used for sonication-induced spatially and temporally localized anesthesia of the brain. In practice, after receiving the particles intravenously, a clinician would apply focused ultrasound to the expected surgical volume, while the patient performs tasks to assess functions like language and memory. In doing so, sonication would induce focal anesthesia of the surgical volume, allowing the clinical team to simulate the functional effects of surgery, without having to make an incision, and therefore yield diagnostic and prognostic information of great importance for the patient.

http://airan-lab.stanford.edu

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Congratulations to this Quarter's Awardees (continued)

Nanoprobes, Inc.
Nanoprobes, Inc. develops, manufactures and markets over 100 nanoparticle and associated products with 30 worldwide distributors. Their cancer research program is focused on developing nanoparticles that can be used for diagnosis and therapy. Under the current collaboration, NCL will characterize a new heavy atom nanoparticle that targets brain tumors and highly absorbs X-rays, depositing that additional absorbed energy very locally, just to the tumor, making it more precise than a surgeon's knife. In orthotopic glioma-bearing mice, this treatment (done in collaboration with H. Smilowitz at the Univ. of Connecticut Health Center) not only extends survival more than 2-fold compared to radiotherapy alone, but by breaking tumor barriers, allows drugs that had only a minimal effect on their own or with radiotherapy, to now produce some long-term survivors.

http://www.nanoprobes.com/

If you are interested in learning more about the NCL's services, please visit our website, https://ncl.cancer.gov, or contact us for more information, ncl@mail.nih.gov. **The next application deadline is June 1, 2018**.

The company and nanoparticle descriptions herein were supplied by the Awardee.
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