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Research Update Summary – December 2020

My goal is to develop peptide-based drug delivery systems that effectively target cancer. We mainly use tumor-specific tumor-penetrating peptides, which deliver deep into tumor tissue drugs that are chemically attached to the peptides, and even free drugs that are simply co-injected with the peptides (Sugahara et al, Cancer Cell 2009; Science 2010). One of the peptides named iRGD (clinical name CEND-1) is now in clinical trials as a co-injected enhancer of standard-of-care chemotherapy for pancreatic cancer. A phase 1 study that ended in 2020 showed that iRGD significantly potentiated co-injected chemotherapy without causing additional side effects in stage 4 pancreatic cancer patients (NCT03517176; Dean et al. ESMO Virtual Congress 2020, Abstract 1528P). The peptide will enter a phase 2 study in 2021.

The John Jones Fellowship awarded 2014, led to a publication in which we reported the ability of iRGD to deliver co-injected intraperitoneal chemotherapeutics selectively into peritoneal tumors by enhancing local tumor penetration (Sugahara et al, J Control Release 2015). Of note, this observation has allowed us to develop a novel nanosystem that probes various types of tumors such as pancreatic and breast cancer and disseminated peritoneal tumors with extremely high specificity at a level that has never been achieved before (Liu et al, Nat Commun 2017).

Over the years, we have expanded our work to various forms of tumor-targeted immunotherapies mainly for pancreatic cancer patients. We have submitted several patent applications to this end. One of the technologies will be validated in an investigator-initiated trial in 2021.

Publications


Honors

Idea Award with Special Focus, Department of Defense (USA, 2020)

Blakemore Prize for Resident Research, Department of Surgery, Columbia University (USA, 2019)

Finalist, Poster Competition, Society of Surgical Oncology Annual Meeting (USA, 2019)

Blakemore Award, 1st Annual Research Symposium, Columbia University (USA, 2017)

2nd Place, Annual Research Competition, Department of Surgery, Columbia University (USA, 2016)

Finalist, Poster Competition, Society of Surgical Oncology Annual Meeting (USA, 2015)
John Jones Surgical Society Fellowship Award, Columbia University (USA, 2014)