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Institution: University of Maryland School of Medicine and Roger Williams Medical Center

Award Year: 2014

Project Title: “T cell Immunotherapy for Pseudomyxoma Peritonei”

Project Status: Closeout Procedures

Update 2 (07-2016)

Pseudomyxoma peritonei (PMP) is a rare disease with an estimated incidence of 1-2 per million per year. PMP most commonly affects females during the 4th-5th decades of life. The present standard of care is cytoreductive surgery (CRS) with heated intraperitoneal chemotherapy (HIPEC). HIPEC is only effective when the tumor burden is small enough to enable penetrance of chemotherapy agents. Unfortunately, most PMP patients present with advanced disease, beyond the indications for HIPEC. With no viable therapeutic options, patients with advanced PMP frequently progress to terminal bowel obstruction which presents a glaring unmet clinical need. Recent advances in immunotherapy have yielded promising results for patients with metastatic tumors. One immunotherapy strategy in particular, genetically modified T cell infusions, is very attractive because we are able to manufacture a highly specific product from a patient’s own cells. Chimeric antigen receptor modified T cells (CAR-Ts) are programmed to attack tumor antigens via genetic modification to arm the cells with specific immune receptors. With support from NORD, our team has developed a novel treatment strategy in a pre-clinical model using CAR-Ts to target intraperitoneal tumors cells expressing carcinoembryonic antigen (CEA). CEA is expressed by PMP tumor cells, and is therefore a rational target. We have initiated a significant conceptual and therapeutic advance by studying the intraperitoneal (IP) delivery of CAR-Ts for PMP. Direct IP delivery of CAR-Ts to the site of disease in our animal model has proven to be significantly more effective than conventional systemic delivery. IP CAR-T delivery has enabled a far greater proportion of cells to reach the PMP disease site compared to systemic delivery. Surprisingly, we have also seen impressive response in extra-abdominal tumors following IP delivery. Following completion of our pre-clinical work and human biospecimen studies, we anticipate being well positioned to launch a phase I clinical trial.