

## IMMUNO-ENGINEERING PILOT PROGRAM

### **Background**

Andrea and Craig held a teleconference with Ankur Singh, Assistant Professor of Mechanical Engineering and Biomedical Engineering. The goal of the call was to gain a better understanding of the Immuno-engineering efforts at Cornell and discuss how the ECC Bioengineering task force could work with affiliated faculty to strengthen Cornell's approach to the field. Ankur described ongoing coordination activities and areas of strength in the field. Cornell's efforts to date have been largely funded by NIH and NSF. The University has also supported this priority area with intercampus grants to support cooperation across departments and across campuses. University support has sponsored faculty for approved programs as well as funded a joint conference on immunology in Ithaca. Those seed activities have led to a \$3.5MM NIH grant as well as the creation of a standing "Center for Immunology" to foster cooperative opportunities in Immuno-engineering across Cornell.

Ankur felt that well they had a good start and some early success, there is still not a heavy immunotherapy effort in Ithaca. They are currently working to better establish themselves in several areas including:

- Cell therapy technologies
- Checkpoint Inhibitors
- Cytokine Syndrome Management

Ankur felt the cell therapy area would be a good area of focus for an ECC pilot program

### **Problem Statement**

Cell therapy is a vast and rapidly expanding field where companies and academic investments are exploding. The general field encompasses engineering cells or cell systems for improved health intervention. The field spans in-vivo technologies approaches such as delivery of DNA (genes) or RNA using viral or other vectors directly to patients; ex-vivo approaches such as CAR-T therapies where patient's cells are removed, engineered and reintroduced; and tissue engineering approaches such as replacement organs or biological infrastructure. All of these technologies can be used in many applications such as correct existing problems directly, curing ongoing disease processes, or producing and deliver drugs in-vivo. Individual members of the Cornell faculty have worked in many aspects of the field, but there is not yet a carved out strategy or identity for Cornell in cell therapy. In addition, CTL have helped facilitate interactions with industry where they have been small interactions, but limited industry stakeholders have "taken a whole bite".

### **Proposed Pilot Project**

It is proposed that a sub-team of the ECC bioengineering task force and a group of faculty form a working team to define a strategy to enhance Cornell's stature and position in cell therapy. Elements of the pilot should include a comprehensive inventory of what Cornell is doing in cell therapy engineering currently, as well as how our activities are positioned versus other academic institutions. With this data in hand the task force can work to better define where we can enhance Cornell's unique skills, capabilities and infrastructure to create as leading offering in cell therapy. This will also allow the team

to identify and where possible provide initial introductions to possible industry partners. Finally the team should put in place metrics and check-ins for tracking the implementation of their plan.