Translational Core Laboratory

Rare Asset: Complete In-House Production to Support Gene Therapy

Gene therapy is one of the most exciting developments in modern medicine. Gene therapy also is one of the most complex capabilities for a medical center to build.

Cincinnati Children's is one of the very few pediatric centers worldwide to successfully assemble every component needed to move this exciting new technology all the way from an intriguing idea to an actual tool for treating disease.

The Translational Core Laboratory at Cincinnati Children's is something special. Here, a Viral Vector Core, Vector Production Facility, Hematopoietic Cell Processing Core, Cell Manipulation Lab and Translational Trial Development and Support Lab (TTDSL) all work in concert to function much like a biopharmaceutical company.

"Other children's hospitals may have some of these facilities, but there are not any that have all of the resources in a single group of laboratories," says Lilith Reeves, Translational Core Administrative Director. "Our benefit is that we can help with most any part of moving cellular and molecular therapies from the researcher's lab through the manufacturing and regulatory steps, all the way into clinic. Then we can continue to do the follow-up on patients after treatment."

Specializing in gene and cell therapies for rare diseases and cancer puts the Translational Core Labs right at the cutting edge of medical research, says Diana Nordling, Translational Core Director. The work happening within the Translational Core supports several Cincinnati Children's investigators as they move potentially breakthrough discoveries far beyond animal studies and into Phase I/II human clinical trials.

The facility produced the carefully manufactured, strictly regulated products to be used for a Phase I/II gene therapy clinical trial for sickle cell disease, which is open to enrollment. Collaborative work is underway with investigators for development of products to be used in new gene therapy treatments for thalassemia and hereditary pulmonary alveolar proteinosis (hPAP).

The facility also has served as a partner in multi-institutional projects, including the recent X-linked severe combined immunodeficiency (X-SCID) gene therapy trial. That trial, which included Boston Children's, UCLA Children's

The 30 team members of our Translational Core Lab have supported projects ranging from a gene therapy clinical trial for sickle cell disease to a multi-center clinical trial to treat X-SCID. The team produces viral vectors and other cell products that meet strict U.S. and European standards.

and hospitals in Paris, London and Milan, earned a Distinguished Clinical Research Achievement Award for 2015 and was named one of the Top 10 Clinical Research Awards by the Clinical Research Forum.

This shared facility includes 30 cross-trained researchers and specialists who produce research-quality, pre-clinical and clinical-quality viral vectors, vector modified autologous cell products, along with normal donor hematological cell products. They conduct translational development and process scale-up, translational trials assay support, clinical assay support, assay development, iPSC translation and characterization and more. The lab's key features include:

- Nine ISO-class clean rooms that meet U.S. and EU standards for pharmaceutical grade biologics and cellular-based therapies
- Compliance with Good Manufacturing Practices (GMP) and Good Tissue Practices (GTP)
- A testing lab certified with the American College of Pathology and compliant with the Clinical Laboratory Improvement Amendments (CAP/CLIA)
- Three active Type V Drug Master Files with the FDA.
- FDA Registered GTP Facility

The Translational Core takes on some of the early-stage drug development duties that pharmaceutical makers can be reluctant to perform for products with small potential markets. The core's structure allows a primary investigator to focus on the science while the laboratory team handles the scale-up, validations, and quality oversight.

"In addition to performing the manufacturing and testing, we also provide documentation to support the required regulatory submissions," Reeves says.