

BUILDING THE FUTURE OF MEDICINE CELL BY CELL



When Dr. Stanley H. Appel gave a presentation about cell therapy to the Houston Methodist Hospital Foundation Board of Directors, he accomplished more than simply relaying pertinent information. His presentation served as a call to action for Ann Kimball and John W. "Johnny" Johnson to create a cell therapy center in their names.

"Dr. Appel's talk was very compelling," says Johnny Johnson, who is chair of the Foundation Board. "He did a great job of explaining what was needed and what was possible. It really struck a chord."

Dr. Appel, the Peggy and Gary Edwards Distinguished Chair in ALS Research at Houston Methodist and one of the nation's leading researchers in neurodegenerative disease, talked about cell therapy's potential to transform medicine and shared the importance of having an independent facility at Houston Methodist that focused on cellular therapeutics.

After the presentation, the Johnsons met with Dr. Appel and other leading physician-scientists to delve into the opportunities of creating a cell therapy lab at Houston Methodist. They discussed how the lab could ultimately accelerate new experimental treatments in cancer, heart disease, neurological disorders and other areas.

The Johnsons' visionary commitment to establish the Ann Kimball and John W. Johnson Center for Cellular Therapeutics at Houston Methodist soon followed. In 2019, they made a transformational gift to support the building and equipping of a 5,000-square-foot, state-of-the-art cellular therapeutics laboratory and fabrication facility located in the Houston Methodist Outpatient Center.

LEADERS OF HOUSTON METHODIST CENTERS OF EXCELLENCE
CELL THERAPY INITIATIVES IN THE FORTHCOMING ANN KIMBALL AND
JOHN W. JOHNSON CENTER FOR CELLULAR THERAPEUTICS

Patrick C. McCulloch, MD; Stanley H. Appel, MD; John P. Cooke, MD, PhD; Jenny C. Chang, MD; A. Osama Gaber, MD; and Eamonn M. Quigley, MD

What is it about cell therapy that intrigued the Johnsons and has galvanized the most brilliant physicians and researchers at Houston Methodist? In short, cell therapy involves implanting or infusing live cells — often a patient's own cells that have been treated externally — back into the body to fight disease or repair and rejuvenate dysfunctional cells.

With applications for almost every major disease, cell therapy is one of the most promising areas of research in modern medicine. A few cell therapy treatments have already been approved, with many more in the research and development pipeline.

Translating a cellular therapy from the research laboratory to the patient's bedside requires turning these lab discoveries into clinical-grade doses, and that's where a cell therapy lab comes in. The manufacturing process for cell therapies is highly specialized. It requires a facility to have dedicated equipment and personnel adhering to strict protocols. Only a few such facilities exist, creating waitlists, delays and additional costs for researchers hoping to move their experimental therapies into clinical trials.

Dr. Appel illustrates how this impacted his own research. His work focuses on the role of neurological inflammation and the dysfunction of anti-inflammatory properties in certain cells regarding ALS development. His research showed that taking a patient's own cells and treating them outside the body restored the cells' anti-inflammatory functions, so they could then be infused back into the patient. Early patient trials have shown promise that this anti-inflammatory therapy can slow the progression of ALS.

The process of treating and growing cells that will later be implanted in a patient can only be performed at certain facilities. Dr. Appel had to use the cell therapy lab at a neighboring

institution, adding significant time and expense to the project. Houston Methodist's in-house cell therapy lab will provide researchers privileged access to this vital service. Dr. Appel says this lab will expedite research developments into clinical use at a reduced cost, positioning Houston Methodist to lead in this exciting new field.

"This is a unique opportunity to truly lead medicine worldwide," Dr. Appel says. "My hope is Houston Methodist will be a global destination for game-changing cell therapies. Patients will come here from all over the world."

The Johnsons were convinced not only that a gift to cell therapy was a transformative investment in medical innovation, but also that Houston Methodist's physicians and scientists were the right team to get it done. Longtime supporters of Houston Methodist, the Johnsons have been impressed with the commitment, compassion and brilliance they have encountered at every level of the organization. Mr. Johnson adds, **"Houston Methodist is the right place with the right people to make these medical advances happen."**

Mr. Johnson is a former engineer and energy executive with a wide range of civic and philanthropic leadership roles. Ann is a retired teacher who actively assists charter schools and the Connect Community Initiative in Houston's Gulfton area. They both appreciate the Houston Methodist cell therapy team's practical plan and business-like focus on results.

By designating a portion of their gift to create a matching fund to support cell therapy projects, the Johnsons are increasing the impact of their commitment. The Johnson Center for Cellular Therapeutics will benefit Houston Methodist's six Centers of Excellence, as well as other areas such as the Department of Surgery and the Immunology Center.

EXAMPLES OF WAYS THE CENTER WILL MAKE AN IMPACT

Cancer Cellular transplantation involved in immune therapies is already approved for multiple myeloma and certain lymphomas. However, producing a single dose is cost-prohibitive, and the limited facilities reduce availability and make wait times longer. "It is vitally important to develop an independent, accredited (cell therapy manufacturing) facility to continue providing our patients with the latest, most effective therapies," says Dr. Jenny Chang, the Emily Herrmann Chair in Cancer Research and the director of the Houston Methodist Cancer Center.

Cardiovascular Houston Methodist researchers are working on a next-generation cell therapy involving RNA, genetic molecules that regulate gene expression to effectively reprogram and rejuvenate cardiovascular tissue. "Having an in-house lab to fabricate these new RNA-enhanced cell therapies is essential," says Dr. John Cooke, the Joseph C. "Rusty" Walter and Carole Walter Looke Presidential Distinguished Chair in Cardiovascular Disease Research and director of the RNA Therapeutics Program at the Houston Methodist DeBakey Heart & Vascular Center. "Getting RNA to restore and improve cell function is a new arena, and we could do things here that aren't being done at any other academic medical center," Cooke says.

Neurology Dr. Appel's anti-inflammatory cell therapy for ALS may also pave the way for other neurodegenerative conditions like Alzheimer's and Parkinson's, since neuro-inflammation is considered a major factor in the development and progression of those conditions.

Organ Transplantation Cell transplantation therapies hold promise across the whole spectrum of organ failure treatment, including helping transplanted organs survive without having to suppress a recipient's immune system, preventing

viral infections after transplants, better preserving donated organs before transplantation and, one day, even rejuvenating failing organs without the need for a transplant. "The new capabilities we will have with the Johnson Center for Cellular Therapeutics will play a key role in improving transplant care and in our ultimate vision of growing new organs from a patient's own cells," says Dr. A. Osama Gaber, the J.C. Walter Jr. Presidential Distinguished Chair and director of the Houston Methodist J.C. Walter Jr. Transplant Center.



JOHN W. AND ANN KIMBALL JOHNSON

Orthopedics Osteoarthritis affects 3 million Americans every year, and potential cell therapies using a patient's own cells to rejuvenate cartilage tissue could treat and even prevent the development of arthritis. "Harvesting and activating a patient's own cells is the next frontier in orthopedic research and treatment," says Dr. Patrick McCulloch, the John S. Dunn Chair in Orthopedic Surgery and associate professor of Clinical Orthopedic Surgery.

Gastroenterology Cellular therapeutics holds special promise for inflammatory bowel disease patients, according to Dr. Eamonn Quigley, the David M. Underwood Chair of Medicine in Digestive Disorders and director of the Lynda K. and David M. Underwood Center for Digestive Disorders. Researchers are focused on identifying and harvesting stem or progenitor cells that could be extracted from a patient and then implanted back to regenerate intestinal tissue.