

## Respiratory Disease Fact Sheet

CIRM funds many projects seeking to better understand respiratory disease and to translate those discoveries into new therapies.

### Description

Severe blockage of the major airway, or trachea, is relatively rare but is severely debilitating and often causes death. Estimates suggest 200 new cases occur in California each year. The blockage most often occurs after injury, treatment for a tumor or following insertion of a breathing tube for other medical procedures. Physicians currently treat these blockages through surgery or by using a stent to hold the airway open. But neither approach produces very good or lasting results. Replacing the damaged trachea with a new one could be a potential cure. A few teams around the world are working with different types of natural and synthetic scaffolds to try to grow new tracheas for transplant using stem cells.

### Clinical Stage Programs

#### University of California, Davis




The team uses a trachea from a cadaver as a scaffold, removing the soft tissue cells and then seeding the remaining scaffold with two types of stem cells from the patient. That construct is grown in a bioreactor until it is ready for transplant in the patient. The team has already used the procedure through the European compassionate use exemption in five dying patients, saving three of their lives. They plan to use this award to do tests in non-human primates to better understand the role of each type of stem cell used to seed the scaffold.

### CIRM grants targeting respiratory disorders

Researcher name	Institution	Grant Title	Grant Type	Award Amount
Brigitte Gomperts	University of California, Los Angeles	Stem Cells in Lung Cancer	New Faculty II	\$2,381,572
Martin Birchall	University of California, Davis	Airways for Children	Disease Team Therapy Planning I	\$19,800
Brigitte Gomperts	University of California, Los Angeles	Using human induced pluripotent stem cells to improve our understanding of Idiopathic Pulmonary Fibrosis	Tissue Collection for Disease Modeling	\$811,231
Peter Belafsky	University of California, Davis	Tissue Engineered Recellularized Laryngotracheal Implants	Disease Team Therapy Development III	\$3,181,162
Barry Stripp	Cedars-Sinai Medical Center	Epithelial progenitors and the stromal niche as therapeutic targets in lung disease	Research Leadership	\$4,841,830
Brigitte Gomperts	University of California, Los Angeles	Stem Cells for Lung Diseases - Overcoming Barriers to Find New Therapies	Conference - Lung Regenerative Medicine Workshop	\$44,548

Matthew Porteus	Stanford University	Genome Editing to Correct Cystic Fibrosis Mutations in Airway Stem Cells	Quest - Discovery Stage Research Projects	\$1,968,456
Semil Choksi	University of California, San Francisco	Generation of human airway stem cells by direct transcriptional reprogramming for disease modeling and regeneration	Inception - Discovery Stage Research Projects	\$238,408
Brigitte Gomperts	University of California, Los Angeles	Identifying a lead compound for COVID19 using high throughput screening with lung stem cell organoids	Discovery Research Projects	\$149,998
Gay Crooks	University of California, Los Angeles	Stem cell-based rapid identification of SARS-CoV-2 T cell epitopes and T cell receptors for therapeutic use	Discovery Research Projects	\$126,692
John Zaia	City of Hope, Beckman Research Institute	Evaluation and Characterization of SARS-CoV-2 Antibody in Convalescent Volunteer Plasma Donors for Potential Therapeutic Use	Clinical Trial Stage Projects	\$999,999
Xiaokui Zhang	Celularity Inc	A phase I/II study of human placental hematopoietic stem cell derived natural killer cells (CYNK-001) for the treatment of adults with COVID-19	Clinical Trial Stage Projects	\$750,000
PREET Chaudhary	University of Southern California	Chimeric Antigen Receptor Targeting Spike Glycoprotein of SARS-cov2	Discovery Research Projects	\$248,125
Evan Snyder	Sanford Burnham Prebys Medical Discovery Institute	Using hiPSC-derived lung organoids, a clinically-relevant system, to validate & winnow a list of approved drugs that inhibit SARS-CoV-2 cytopathy	Discovery Research Projects	\$228,229
Karen Christman	University of California, San Diego	Pro-healing biomaterial for treating lung inflammation associated with COVID-19	Discovery Research Projects	\$221,758
				Total: \$16,211,808.00

## CIRM respiratory disorders videos

 <p><b>Matthew Donne, UCSF - CIRM Stem Cell #SciencePitch</b></p>	 <p><b>Youngtae Jeong, Stanford - CIRM Stem Cell #SciencePitch</b></p>	 <p><b>Asaf Presente, UCSD - CIRM Stem Cell #SciencePitch</b></p>
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Source URL: <https://www.cirm.ca.gov/our-progress/respiratory-disease-fact-sheet>