Building a Powerhouse Team To Tackle Lung Cancer

When Roy S. Herbst, MD, PhD was beginning his career, he did not intend to focus on lung cancer, a disease with few effective treatments. But his mentor, groundbreaking cancer researcher Emil Frei, urged him to reconsider. “This is where your talents are needed,” Dr. Frei said. “There will be advances. You just have to be perseverant.”

Decades later, there still are not enough effective treatments against lung cancer, the leading cause of cancer deaths among adults in the US. Dr. Herbst realizes that he not only needs to persevere against lung cancer – he needs to inspire a team of talented scientists to do the same. He is the lead investigator on a new $11 million grant from the National Cancer Institute. The highly competitive Specialized Programs of Research Excellence (SPORE) grant program involves research scientists and clinicians who work in both labs and clinics. This ensures that advances in laboratory science are rapidly put to work to develop more effective treatments.

Dr. Herbst is Associate Director for Translational Research and Chief of Medical Oncology at Yale Cancer Center and Smilow Cancer Hospital, a role that consistently requires him to do matchmaking between scientists with different specialized expertise that can move a project forward. “You want the best science from the best people, but the key thing is working collaboratively, translationally,” he said.

The grant will focus on non-small cell lung cancer (NSCLC), the most common form of lung cancer. It will take a two-pronged approach: developing better treatments and finding more effective ways to help people stop smoking. Most, though not all, NSCLC patients are smokers.

One team will study immunotherapy in NSCLC – helping the body’s own immune system to combat tumors. “Twenty percent of lung cancers immediately respond to immunotherapy,” said Dr. Herbst. “We want to get that up to 100 percent.”

Lieping Chen, MD, PhD who is co-principal investigator for SPORE, will lead basic science work on the project. Dr. Chen is Co-Director of the Cancer Immunology Research Program at the cancer center.

Another project will explore microRNA-based therapies for metastatic NSCLC, which is currently incurable. The team will work with cancer biologist Frank Slack, PhD, now at Harvard. When Dr. Slack was at Yale, he discovered a microRNA that regulates critical oncogenes. His work identified that microRNAs could be both causes of lung cancer and potential therapeutic agents against it.

A third group will explore the Epidermal Growth Factor Receptor (EGFR). Mutations found in the EGFR signaling pathway play an important, though not sufficiently understood, role in lung adenocarcinomas. Additional knowledge could be used to create more targeted therapies and to develop strategies against tumors that become resistant to treatment.

The grant also includes a project to study smoking cessation in lung nodule patients. Lung nodules are typically discovered when a patient has a CT scan. People with these nodules are at heightened risk for lung cancer, so helping them to quit tobacco use has a special urgency. The team will study how well specific behavioral interventions and medications work in assisting these people to give up smoking. They will also track changes in biomarkers among patients who succeed.

The new Yale SPORE in Lung Cancer will create several resource cores that will help lung cancer researchers from throughout the cancer center with support in administration; biostatistics and bioinformatics; and biospecimen banking, pathology, and genomics. The latter will be critical in banking biological material, what Dr. Herbst calls “those very, very precious patient samples,” to be used in research.

With the award, Yale Cancer Center becomes one of a select group of institutions to be awarded two SPORE grants from the NCI. The cancer center already has a SPORE focused on skin cancer. Dr. Herbst also works to mentor other teams at Yale to facilitate similar programs focused on other cancer types.

The only way to approach a problem as big as lung cancer is to have experts in basic, translational, and clinical research working on several fronts taking the research from the lab to the clinic and back again to develop even newer insights.