



# Putting It All Together:

## Research from the beginning to the end

### **How do the molecules, genes, and cells of the respiratory system conspire to create lung diseases?**

And if a drug can be invented to eliminate disease, how would we know that it works? The answer to these questions are important because drug-makers need to know how drugs work, ways to find out if new drugs have the desired effects and how good these drugs are at “targeting” the areas where they are most useful. For example, we use to be satisfied finding drugs that *controlled symptoms* of conditions like asthma, chronic obstructive lung disease and lung cancer. Because of our understanding of how genes, molecules and cells in the respiratory system work, drugs are now being developed to not only control symptoms of these diseases, but cure them as well.

### **What is the role of scientists in making drugs?**

To make this approach work, scientists from many different fields are needed to pull it all together. How molecules work, how the biology of tissues change at the cellular level, how changes in the structure of the lung, and ultimately, how lung function is improved, needs to be tested. These tests are first done in mice and then in people. Pulling it all together takes scientists with a variety of backgrounds such as physicians, biologists, physiologists, engineers, all working together to invent technologies of many different kinds, and using those technologies to improve patient care.

### **What is the goal of these scientists?**

By working together, the goal of scientists is to eliminate lung disease. These efforts then pave the way for drug companies to commit the large investment of money that is needed to bring new therapies to the patient.

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