Like a frontier, science is vast; it’s endless. And like a pioneer entering a new land, when a scientist gazes across that expansive space, he sees opportunity and he sees freedom to pursue his thoughts and interests. Broadly speaking, there are two main types of scientists: the “basic” scientist, and the clinician. The basic scientist is most like the pioneer in that he has the most range to pursue his work, but unfortunately not always the most opportunity. The clinician is like the town doctor; he has access to all the clinical material, but not always the freedom or the knowledge to pursue the research necessary. But what happens when the basic scientist collaborates with the clinician? Results are found, science’s unanswerable questions are solved, and clinical diagnosis and treatment of disease can be improved.

Translational research has numerous definitions, all of which have two ideas in common: application of results and collaboration between different fields of research. Because the basic scientist devotes his career to research, he develops the breadth of knowledge needed to assist humanity (for example, the intricacies of disease biology or the development of a drug to manipulate the disease process). And because the clinician devotes his career to the patient, he has insights into what is needed to control or cure a disease, but doesn’t always have the time or the know-how to pursue that notion. That is why we need to encourage basic scientists across all ages, career levels, and geographic locations to look for a way to take their invaluable research and, if at all possible, find a way to apply it to the cure of pulmonary vascular disease. Likewise, we encourage all clinicians to collaborate and share their thoughts with basic scientists in order to identify the genetic and pathogenic mechanisms of pulmonary vascular disease (Fig. 1).

Of course, like anything worth pursuing, there are barriers to translational research, the most poignant of which is funding. Many funding agencies typically encourage either basic research or clinical trials; they are somewhat resistant or reluctant to support moving discovery from wet laboratory research to patient care via drug development. Additionally, very few basic scientists have the opportunity to learn about drug development, disease pathogenesis, clinical management of a disease, and very few have the access to clinical data and patient’s samples and specimens needed to engage in translational research. Moreover, most basic scientists work in the world of academia where translational research may be encouraged, but is not a major focus, for tenure and promotions. And because of these challenges, collaboration between the basic scientist and the clinician is trying; without that key element of collaboration, translational research may cease to exist.

Figure 1: Collaboration between clinical and basic science.

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For inspiration, look to the work of Dr. Daria Mochly-Rosen who initiated SPARK at Stanford University, a program designed to help strengthen the appeal of translational research and especially to encourage young investigators to consider its potential. The driving forces behind SPARK include five main ideas: (1) direct funding tied into the achievement of milestones; (2) seminars and hands-on programs on drug and diagnostic development; (3) biweekly progress reports; (4) access to facilities; and (5) mentorship. For more detailed information on the SPARK program, please visit http://sparkmed.stanford.edu/.

The promotion of translational research will only be successful if there is an increase in collaboration; the Pulmonary Vascular Research Institute (PVRI) has set an example in this setting. The PVRI is a forum for interaction between basic and clinical scientists; Pulmonary Circulation, for example, is a medium where both the clinician and the basic scientist meet in print. In the developing world, where the problem of pulmonary vascular disease is all too rampant, translational research is almost non-existent. There are many reasons for this (the number of scientists working in “basic sciences” is too few, lack of funding, lack of interest from funding agencies, lack of adequate laboratory equipment, clinicians have too many patients to tend, etc.), but forums like PVRI and Pulmonary Circulation may help inspire action.

Basic scientists and clinicians everywhere have the potential to increase awareness and to possibly control pulmonary vascular diseases; they do not, however, always have the knowledge or the opportunity needed to complete these actions. The basic scientist must again look across that vast space, but this time he must look not only for the pursuit of research, but he must discover or create opportunity where it lies. And the clinician must take his knowledge about his patients and help the basic scientist grab hold of that opportunity. And together they must apply their minds and their work, and break down the barriers to achieve their ultimate goal, a cure for pulmonary vascular disease.

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