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The Physician and the Physician Scientist

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"The mission of the physician is to prevent disease, to relieve from suffering and to heal the sick."[1] To achieve these goals, the physician must have appropriate medical training, technical skills, the ability to interact with people and the capacity to make appropriate quick decisions.

The physician must understand the human body, including cell function, organ structure and function, interrelationships between organs and how disease states alter the structure and function of the human body. The physician must learn scientific facts and principles: however, it is not necessary to learn the experimental details that lead to these facts.[2] The physician bases his/her practice on what is known. The physician develops skills to assess and treat a patient by obtaining a medical history, conducting a physical examination, and with the use of technology. The physician has the ability to act immediately, because acutely ill patients need immediate action.[3] Some individuals have the capacity to easily absorb an enormous amount of information. They can use this information to assess problems quickly and have the ability to act immediately; these individuals have the potential to become great physicians.[2]

The goal of the scientist is to conduct research and to advance current knowledge. While the physician is practising on what is known, the scientist is mostly dealing with the unknown. The scientist sees the gaps in our knowledge. The scientist must be critical, imaginative and curious.[2,4] Scientists concentrate their efforts on why things happen, focusing on mechanisms. The scientist conducts carefully thought out experiments to prove or disprove hypotheses. While the physician often has to act immediately, the scientist, as a general rule, has plenty of time to make an important decision. Individuals with these qualifications have the potential to become excellent scientists.

There are also some rare individuals who have the ability to perform both well, to be a physician and scientist. They can work with patients easily, using contemporary medical knowledge, but at the same time they can conduct research to advance current knowledge. Over the last decades, great developments in basic sciences and technology have been made. These inventions, however, are not widely applied to the clinic and, unfortunately, the gap between discoveries from the basic sciences and the clinical applications of these discoveries is widening. Some may be wondering why so much progress from basic sciences is not widely applied at the bedside? The problem is that there are not enough physicians/ scientists, who can immediately apply new findings from the bench to the clinic, who can test observations from the bedside to the basic research laboratory, and who will bridge the gap between basic research and clinical practice.[2]

Clinical trials are not producing creative research. Physicians involved in the trials usually do not have the qualifications of the physician/scientist. Further, in the trials physicians are told exactly what to do and which parameters to measure. Of course, we need physicians to conduct these trials, but this type of research does not provide insights into fundamental mechanisms of diseases.[2]

Medical schools, medical training programs and academic institutions involved in biomedical research, should early identify individuals who have the

potential to become physicians/scientists, ie. physicians who are good clinicians but also able to conduct basic/translational research. These individuals should have all the support they need to enhance their clinical skills and to advance their research ability.

Medicine and science require complementary thought processes. The processes that work for one may not work for the other. Medicine needs research to advance current knowledge, good physicians to take care of the sick (patient care is too important to be left to the basic scientists), and physicians/scientists who will bridge the gap between basic sciences and clinical practice. The physician/scientist will contribute significantly to the application of the great discoveries from the bench to the clinic and will also assist in much needed close collaboration between basic scientists and clinicians.

References

1. Osler W: Chauvinist in Medicine, an address given to the Canadian Medical Association, Montreal 1902 (The Collected Essays by Sir William Osler, Birmingham, Ala, The Classics of Medicine Library, 1985, vol. 1).
2. Brown MS: The making of a physician-scientist, in Cook Grossman D, Valtin H (eds.): Great issues for medicine in the twenty-first century. Ann N Y Acad Sci 1999; 882: pp 247-256.
3. Boudoulas H: The well-rounded clinician. Hellenic J Cardiol 2006; 46: 317
4. Boudoulas H: Ethics in biomedical research. Hellenic J Cardiol 2006; 47: 193.