

Current Status and Future Direction of Physician-Scientists Training in Korea



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In their new *JID Innovations* article, “Training Physician-Scientists for Careers in Investigative Dermatology,” Li et al. (2021) describe the difficulties of nurturing physician-scientists in the United States and their causes. In Korea, the importance of physician-scientists is also being emphasized, and medical schools and the government are making great efforts to foster physician-scientists as well. As a result of these efforts, the number of those obtaining a doctoral degree after residency training in clinical departments, including dermatology, is increasing in Korea. However, more systematic support from the government, medical schools, and their affiliated hospitals is needed so that more physician-scientists can conduct research to identify the causes of diseases and develop new treatments while practicing medicine. In this commentary, we would like to comment on the situation of physician-scientists in Korea.

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Introduction

In their new article, “Training Physician-Scientists for Careers in Investigative Dermatology,” in the *JID Innovations* Li et al. (2021) shed light on the problems of nurturing physician-scientists and the efforts of the medical community in the United States. The article analyzes the causes of the decrease in the number of physician-scientists in each clinical department, including dermatology, and suggests various ways to recruit and support talented scholars to conduct research. This commentary aims to introduce the current status of physician-scientists in Korea and the physician-scientist training program for the advancement of basic medical sciences and the vitalization of the medical industry in Korea.

Increased awareness of the importance of physician-scientists in Korea

The importance of physician-scientists is being increasingly emphasized in

Korea. Although the current physician-scientist training program is by no means perfect, medical schools and the government are putting forth great efforts to foster physician-scientists through various programs.

In Korea, modern medicine began in 1885 at Jejung Hospital, the predecessor of Seoul National University Hospital (SNUH) (Seoul, Korea). The field of dermatology in Korea first appeared in 1909 at Daehan Hospital (Seoul, Korea), which was the old name of SNUH (Park et al., 2020). After liberation from Japanese occupation in 1945 and the Korean War from 1950 to 1953, Korea has made a leap in the development of the field of medicine. Although it has been emphasized that the advancement of basic medical sciences is crucial to accelerate the development of modern medicine, the government's support for basic medical science was not significant owing to the poor economic status. It was only after Korea's economic situation improved that the

support for basic medical science expanded.

In Korea, several students who graduated from medical school received training as physician-scientists in the fields of basic medical science such as biochemistry, physiology, pharmacology, and anatomy, after which they became professors. Since the 1990s, the number has been gradually falling. The proportion of physicians among basic medical science faculty in Korea has decreased to about 40%, and students are continually avoiding basic medical sciences. The reason is that many students prefer to receive training in the clinical departments and become clinicians. There are various reasons why only a few physicians choose basic medical science, from economic reasons to a mediocre research environment, insufficient research funds, and a pessimistic outlook on the possibility of success through research. In recent years, patient care and health care in Korea have rapidly developed and reached a high level, whereas the advancement of basic medical science has been relatively slow. Those who are leading the medical field in Korea are well aware of this crisis and are raising their voices that efforts should be made to support and foster physician-scientists (Han, 2015).

In the past, the educational goal of medical schools in Korea was to train primary care doctors. Because the educational objective was to educate clinicians to treat patients well rather than to conduct research, the emphasis was on treatment capacity rather than on research capacity. However, many have come to think that clinical medicine cannot advance to a full extent unless basic medical science is strong; consequently, nurturing physician-scientists has been added as one of the important educational goals of medical schools. As a result, many physician-scientist training programs are emerging in Korea, and more weight is being put on basic medical science education in the medical school curriculum.

The role of the clinician is mostly limited to applying current medical knowledge to patients. However, physician-scientists who are proficient

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in basic medical science can discover new knowledge about the disease and develop novel methods that can be applied in practice, which may greatly benefit patients. In other words, if clinicians understand the principles of physiological phenomena in the human body on the basis of basic medical science, it will be of great help in identifying the causes of diseases and discovering treatments that can stop the disease process. In addition, medical knowledge revealed through research can be used to develop new drugs and devices, which can greatly contribute to the medical industry. These are all possible only if the clinicians are skilled at basic medical science research, supporting the idea that fostering physician-scientists is crucial.

Korea has also come to recognize the importance of physician-scientists recently, and for this reason, there is a consensus that the number of physician-scientists should increase. The consensus is that doctors should be researchers, not technicians. As a result, not only the medical community but also the government is making great efforts to foster competent physician-scientists.

Current status of physician-scientist training program in Korea

Medical education in Korea is focused mainly on training clinicians to treat patients. Over the past 20 years, the nation's top-notch students have been concentrated in medical schools, and the clinical skills and service have reached a high level. However, there is a lack of training for physician-scientists, and the doctoral programs in basic medical science departments are being filled with graduates of basic science and engineering colleges instead of doctors with a medical degree. This may be due to the idea that the future of a basic medical scientist is relatively unclear compared with that of a clinician practicing medicine. In addition, the main causes may be the possible disadvantages in future careers, a lack of economic motivation, and substandard degree programs.

A physician-scientist literally refers to a physician who has been trained as a scientist for a sufficient period of time. There are currently three ways to receive education as a physician-

scientist in Korea: (i) during the undergraduate course of medical school, one can extend the period of receiving basic education to become a doctor and obtain a master's or doctoral degree along with the medical degree; (ii) after graduating from medical school, one can enter the basic medical science department, get a doctorate, and walk the path of a researcher who devotes oneself to basic academic research without patient care; and (iii) one can go through the doctoral course during or after resident training (Kim, 2019).

The first system allows the medical students to acquire MD–MS or MD–PhD degrees by creating a 1–4–year course for obtaining a master's or doctoral degree in conjunction with the main 4-year medical school course. However, only a small number of students are applying for it. The reason for this is that the other students in the same class graduate and receive residency training more quickly, which makes those who selected this special course feel like they are falling behind their peers. It may also be because there is no certainty that obtaining a master's or doctoral degree will have a positive effect on their being selected as residents or professors in the future.

The second way is to become a basic scientist by getting a doctorate in the basic medical sciences such as biochemistry and physiology instead of choosing a residency program or starting a private clinic. In Korea, only a small percentage (<1–2%) of graduates remain in the field of basic medical sciences after graduating from medical school. Most graduates walk the path of clinical training after becoming doctors. The main method of becoming a physician-scientist has been to enter a basic medical science department after graduating from medical school to obtain a doctorate degree, but this also is losing its popularity among students. The unpopularity is due to the lack of awareness of the importance of basic medical science and insufficient investment because the main focus of the medical society has been on clinical care.

The third path is a recent system that allows specialists who have received resident training to conduct full-time research in a PhD program in the basic medical science, natural science,

or engineering department to become a physician-scientist (Kim, 2015). Korean men are obligated to serve in the military for 3 years, so they must serve as military doctors after joining the military. After the establishment of a 4–5–year physician-scientist training course that can replace military service, the number of doctors choosing this course to gain research experience and obtain doctorate degrees is increasing.

In a survey that asked the applicants about the reasons for choosing this third path, 33.6% of the respondents said that they applied because of their interest and passion for basic research, 26.3% said that it would help their careers, and 14.5% said that it was because they could simultaneously solve their military service obligations. This suggests that many doctors choose this path not only due to their interest and passion for research but also for the purpose of self-development along with the advantage of being able to replace military service. It was in the late 2000s that the doctors started to apply for this system, thus not many people have confirmed their careers yet. However, according to a survey, the majority of the graduates are continuing research in medical schools or laboratories, which may imply that this system has succeeded to some degree. In particular, the number of dermatologists who have replaced their military service with PhD programs is increasing, which has led to the advancement of research in the field of dermatology.

Investment is needed to nurture Korean physician-scientists

Intensive support and investment are needed in the field of basic medical science. Focused investment in this field is a global trend, and the results of the research in this field are actually providing practical help in treating patients worldwide. Likewise, the Korean government is making efforts to more actively invest in fostering physician-scientists, and medical schools and university hospitals are also preparing a system that provides advantages to physician-scientists (Juhnn, 2016). University hospitals are providing labor costs to doctors who are conducting full-time research in basic medical science, and they are also creating an

environment for the doctors to work as residents after obtaining a doctorate. The government has recently introduced and implemented a system to provide labor and research expenses to physician-scientists. Further systematic support is needed.

To foster physician-scientists, focused and intensive investments are needed rather than sporadic short-term investments. In addition, for the basic medical sciences and clinical medicine to show a synergistic effect, cooperation among researchers in various fields is essential. This demands a sufficient number of equipped physician-scientists, enough to reach a critical mass so that they can work together to achieve synergies. This requires state-led intensive cultivation of human resources for a considerable period of time.

In conclusion, to foster more physician-scientists in Korea, first, long-

term, systematic support is needed for the doctors to fully acquire scientific research skills. Second, the government and the medical society should devise plans to secure and maintain the vocational stability of physician-scientists.

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