The Optimization Method of Biochemistry Teaching in Medical Education under the Background of Transforming Medicine

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Abstract: In recent years, with the introduction of the concept of translational medicine, more and more experts in basic medicine and basic medicine have recognized it. In this paper, the teaching reform of the course is proposed from three aspects: the teaching method, the teaching content and the experimental teaching content, and the concept of translational medicine is introduced into the teaching of Biochemistry and molecular biology. The infiltration and transformation of medical concepts in the teaching of Biochemistry not only cultivates the thinking mode of students' basic medical research, makes students have a comprehensive and clear understanding of basic research, but also deepens the understanding and understanding of the knowledge learned, and cultivates students' innovation ability.

1. Introduction

Biochemistry lays the foundation for the follow-up immunology, pharmacology and other courses. It is also of great significance in the application of medical work, and it is a subject that medical workers must master. With the rapid development of modern medicine, endless new theories and technologies have been more and more integrated into the whole process of prevention, diagnosis and treatment of diseases in basic medicine and clinical medicine, breaking the barrier between basic and clinical medicine, directly related to laboratories and beds [1-3]. In the context of the development of translational medicine, the traditional “learning based on Theory Teaching” education mode has gradually changed, instead of the targeted medical education mode with clinical practice as the ultimate goal [4-5]. As far as biochemistry is concerned, its educational concept, implementation mode, assessment and evaluation system are also in urgent need of reform. The four stages of translational medicine are shown in Figure 1. While inheriting the advantages of traditional education methods, it is also necessary to fully consider the combination with clinical practice, so as to realize the positive interaction of “from classroom to clinic, from clinic to classroom”.

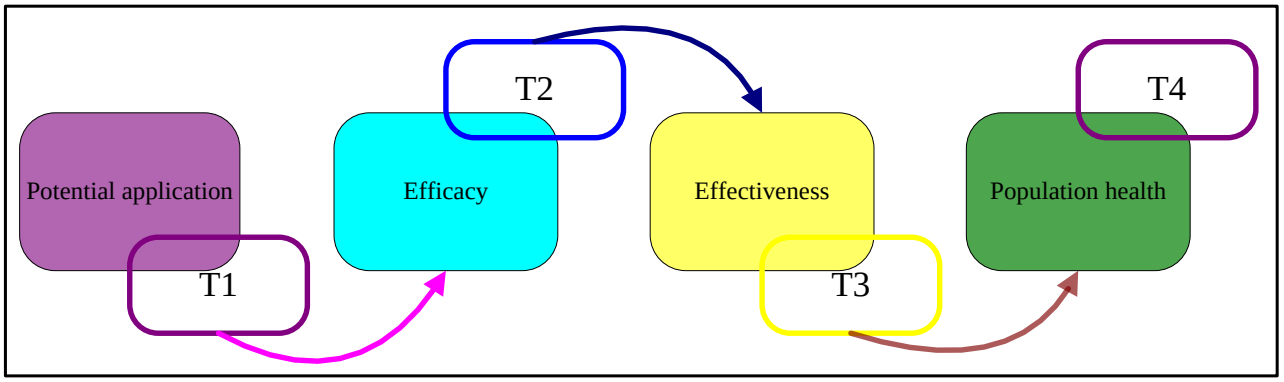

Fig.1 Four Stages of Translational Medicine

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2. Characteristics of Biochemistry and Molecular Biology

2.1 Many Knowledge Points, Abstract and Complex Content

There are many knowledge points in biochemistry and molecular biology. Students study very hard, and in the senior year, the content of biochemistry is almost forgotten. This requires teachers to combine with diseases and clinical phenomena when teaching knowledge points. Each knowledge point of biochemistry is not isolated and permeates different life phenomena and clinical phenomena. Once knowledge points are combined with life phenomena and clinical phenomena, the effect of awakening is achieved.

The abstraction of Biochemistry content lies in complex molecular formula, dazzling enzyme and metabolic reaction, and complex metabolic regulation mechanism. These knowledge points make students hard to remember and boring to learn. This requires that teachers should not only explain logically and hierarchically, but also closely contact with clinical and application results, so that students can understand these contents in depth and concisely [6-7]. By explaining the molecular mechanism of life phenomena, students can understand the chemical nature of life phenomena in depth and cultivate students' logical thinking. Through the connection of molecular mechanism with disease and life phenomenon, students can simplify their knowledge points and remember them deeply. At the same time, students' divergent thinking is cultivated and students are encouraged to explore new application fields.

2.2 Strong Practicality and Exploration

Biochemistry has a strong practicality, and experimental courses account for a certain proportion in the whole curriculum system. The task of the experiment course is to enable students to master the basic principles and operation of biochemical experiments, and cultivate students' ability to analyze and solve problems and innovation [8]. The former biochemical experiment course mainly serves for the theory course, and the experimental content is mainly confirmatory. The students can't fully develop their creative thinking ability by following the prescription. This is contrary to the idea of transforming basic medicine to clinical medicine, which is advocated by translational medicine. Therefore, it is imperative to apply the concept of translational medicine to the teaching reform of biochemical experiment course.

2.3 Cutting Edge Achievements Emerge in Endlessly

Biochemistry and molecular biology are the leading disciplines in the field of life science. Various new technologies and methods of Biochemistry and molecular biology can be applied in various fields of life science, promoting the development of the whole life science and basic medicine [9]. The traditional teaching mode mostly emphasizes the achievements and knowledge system of previous research, while the forward-looking and cutting-edge research results are rarely introduced in the biochemistry teaching of undergraduate stage. Therefore, the teaching content is relatively old, which is not commensurate with the rapid development of molecular medicine. Translational medicine emphasizes the close combination of foundation and frontier. Therefore, the introduction of frontier theory and technology in the field of life science in classroom teaching broadens students' horizons and improves their enthusiasm for scientific research.

3. The Enlightenment of Translational Medicine to the Teaching of Medical Biochemistry and Molecular Biology

Medical Biochemistry and molecular biology are the bridge between basic medicine and clinical medicine. So how to carry out the spirit of transforming medicine in the teaching process of Biochemistry and molecular biology? Next, the author analyzes the teaching reform of Biochemistry and molecular biology.

3.1 Teaching with Case Oriented Teaching Method

Medical Biochemistry and molecular biology is an important basic course of medicine, whose theory is closely related to clinical medicine. In this course, there are many concepts, principles and strong logicality, which make students feel abstract, boring and difficult to understand in the learning process, thus reducing students' interest in learning. In the traditional teaching, the teacher is the leading role, teaching knowledge blindly, while the student is the supporting role, passively receiving information blindly. This kind of “one talk” teaching mode hinders the expansion of students' thinking. To introduce the concept of translational medicine into the course construction, teachers should pay more attention to the combination of practice and basic theoretical knowledge, stimulate students' thinking, reasonably connect important knowledge points with clinical knowledge, let students contact clinical early, and organically combine theory with practice [10-11].The transformation medical model is shown in Figure 2.

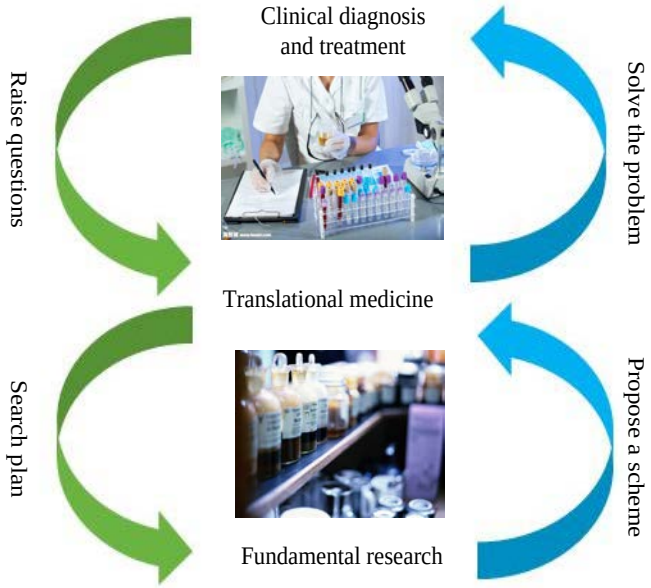

Fig.2 Transforming Medical Model

For example, material metabolism and regulation is an important part of medical biochemistry and molecular biology, which can be fully combined with clinical knowledge. For example, diseases caused by abnormal metabolism of substances, such as diabetes, hyperlipidemia, atherosclerosis, megaloblastic anemia, gout, etc., which can be introduced into the curriculum. When talking about the metabolism of plasma lipoproteins, we can list the common hyperlipidemia in clinic. Through the actual cases, the related biochemical indexes and electrophoretic patterns, the students can analyze and discuss the types, causes and treatment of hyperlipidemia according to the knowledge they have learned [12]. Such teaching not only makes the students consolidate and deepen the theoretical knowledge they have learned, but also exercises their ability to analyze and solve practical problems, so as to improve their self-confidence and enthusiasm for learning.

3.2 Introducing the Concept and Content of Translational Medicine into the Teaching of Theory Course

According to the characteristics of medical colleges and universities, in the late teaching of medical biochemistry and molecular biology, the part of clinical biochemistry is added, the concept of translational medicine is introduced, and a bridge is built between clinical medicine and basic medicine. For example, when teaching the special topic of molecular medicine, the author takes the topics that are closely combined in recent basic research and clinical research, such as tumor molecular markers, genomics and proteomics, biochemical mechanisms and molecular markers such as tumor and metabolic diseases, as examples, and combines them with the application of

modern molecular biology technology. The focus of translational medicine research is shown in Figure 3. Taking the metabonomics of thyroid cancer and tumor and the metabonomics of moyamoya disease as examples, the research ideas and methods of marker screening were explained from the perspective of basic research. At the same time, the relevant clinical departments are also invited to explain the importance of markers for clinical disease diagnosis from the clinical point of view, as well as the related problems that need to be solved in basic research of clinical disciplines. Through similar teaching, the mutual transformation between basic research and clinical is explained, so that clinical students can deeply understand the true meaning of translational medicine.

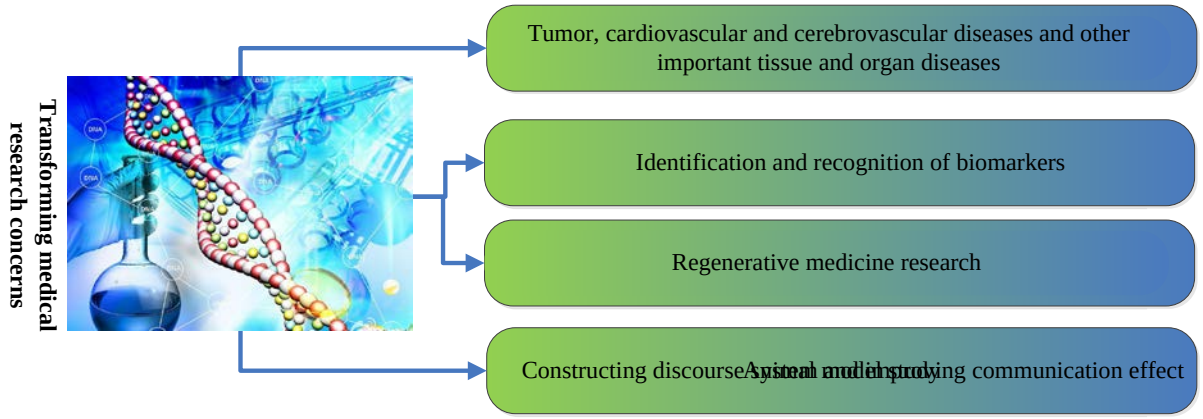

Fig.3 Transforming Medical Research Concerns

3.3 Increase the Independent and Comprehensive Design of Molecular Biology Experiment in Experimental Teaching

Basic and commonly used molecular biology experiments have become the necessary means of basic research in clinical medicine. In order to better cultivate clinical undergraduates in the form of translational medicine, it is necessary to combine basic molecular biology experiments with each other, improve the experimental thinking and practical ability of clinical undergraduates, and better connect basic experiments with clinical knowledge. The author's school divides the molecular biology experiment into two parts, one is the basic molecular biology experiment, such as plasmid extraction, PCR digestion, recombinant plasmid transformation, and the other is the expansibility experiment, that is, the independent comprehensive design experiment.

The teacher arranges related subjects. After the students are divided into groups, they consult the literature, design the experimental process and relevant technical means applied, and then independently prepare the articles needed for the relevant experiments according to the laboratory conditions, carry out the relevant experiments. After the experiments, they independently evaluate the experimental results and analyze the gains and losses. In the whole process of designing experiment, students are in the state of independent learning, the purpose of learning is very clear, the creative thinking of students is more active, which is conducive to the cultivation of innovative talents. This kind of design teaching method greatly mobilizes students' interest in scientific research and initiative in learning, and greatly improves the efficiency of experimental courses. Through this kind of independent experimental design, on the one hand, students can make the first part of the basic molecular biology experiment comprehensive, and improve the learning initiative of students. On the other hand, it makes clinical undergraduates understand the research ideas of basic scientific research, cultivate the consciousness of translational medicine, and provide research ideas and means for “laboratory to hospital bed” under the background of translational medicine.

4. Conclusion

In fact, translational medicine emphasizes the change of concept, which will play an important role in the development of medicine. In the training of medical college students in the future, we should always inculcate them with the theory of translational medicine, and in the teaching of basic

medical courses, we should always reflect it. Strengthen the transformation of medical concepts, strengthen multi-disciplinary cooperation, cultivate innovative talents with interdisciplinary background, make full use of various teaching methods, actively explore, improve the comprehensive quality of students and the comprehensive teaching ability of teachers, so as to lay a solid foundation for students' clinical learning and work.

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