

## Medical Organic Chemistry Teaching Reform Initiatives behind Clinical Professional Certification

Wen CHEN, Chao XU, Ming ZENG, Jianbo ZHOU\*

Department of Basic Medicine, Changsha Medical University, Hunan, Changsha 410219, China

\*Corresponding Author: Zhoujianbo0603@126.com

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**Abstract.** In this paper, we combine with the requirements of clinical medicine professional certification to carry out reforms on the aspects of organic chemistry teaching contents, teaching methods, teaching content and evaluation of teaching effectiveness and teaching real research, and teaching staff construction with some certain success.

### Introduction

Clinical professional certification is based on the "Undergraduate Medical Education Standards - Clinical Medicine (Trial)" (Professor of Engineering (2008) No. 9) jointly issued by the Ministry of Education and the Ministry of Health, through school self-evaluation and external experts, to inspect and determine the clinical whether or to what extent the medical profession in line with (or reach) the national standards in terms of education, while helping schools to identify weaknesses or gaps, point out the direction of improvement of medical education, professional training to ensure the quality of clinical medicine. Clinical professional certification, an envelopment platform for China to connect its medical education to the international education system, aims to find shortage of medical education in our country, promote the direction of the school of medical education reform and promise healthy and sustainable development<sup>[1]</sup> of school and medical personnel. In December 2015, Changsha Medical University ushered in the inspection and guidance of appointed experts from "Ministry of Education, Medical Education Accreditation Committee of Experts" with a more smoothly passed of the clinical professional certification. In order to combine with clinical medicine professional certification practice and improve training quality of medical students, all relevant disciplines of clinical expertise have made the appropriate adjustments and reform. Hereinafter, Author has listed the reform initiatives on teaching of medical organic chemistry as below:

**Integrate content of class and introduce medicinal chemistry knowledge with a change from the original pure chemical and medical education to confidential binding in chemistry<sup>[2]</sup>.**

Medical organic chemistry is a basic subject for student who majored in clinical specialty and provides the necessary basic knowledge of organic chemistry, basic theory and basic skills for medical students. The original pure chemical education makes students feel bored in organic chemistry class with weariness that chemistry knowledge is not very useful to his profession. In order to meet the clinical needs of the times and the assessment of professional certification, we not only introduce organic compounds react with each other outside of the structure, properties and matter, but also to highlight organic chemistry close contact with the medicine. Medical students are introduced to some of the related chemical application of knowledge with increased bio-organic chemistry of life, etc. We prune some content which is far away from medication to enhance penetration and clinical application of chemical knowledge for student, so that they could not only obtain some basic knowledge of chemistry, but also to grasp the chemical tools to explore highly specialized problems. For example: When we run into the study of enantiomers definition in Chapter "basic theory of the stereochemistry", we focus on learning the differences

physiologically active enantiomer, and explain to the students of the "thalidomide" event with an extending on international mark of listing approval of chiral drugs, so that students understand the efficacy of the mechanism of chiral drugs is like a key to open a lock. Then the configuration of the drug is consistent with a receptor target in the human body, it works. Otherwise, it won't work. Therefore, the students' interest and motivation are also driven in such class. In addition, we try some medical examples and stories regarding on the material in the class exercises and exams, so that students feel that our lives and the medical world are full of chemical knowledge and the interests of medical students will be better maintained.

### **Combine the teaching with practice and scientific research to enhance student's practical ability and creative ability.**

When explain the chemical theory of knowledge, we should timely integrate some of the relevant knowledge of the drugs production. For example: When study the nature of the carboxylic acid derivative, we introduce "aspirin preparation" process properly and also introduce aspirin clinical knowledge at the same time. So we successfully bring the community and the hospital into our class.

Every year we will select a group of students with more outstanding academic performance to participate in our teacher's research projects, helping us do some research experiments. We encourage students to actively apply for "College Students Innovation Project" and a number of college students' innovative projects related with medicine and chemistry university level, provincial level and national level will be established every year. From 2010 to 2015, 35 projects guided by our teachers in the teaching and research section have been established and project completion is also very satisfactory with student's papers published in national formal publication. Student's practical ability and creative ability has been improved greatly and laid a solid foundation for future research work and further study.

### **Teacher positively declares education and teaching reform subject and applies the achievement to teaching of medical organic chemistry, realizing the reform of teaching mode and evaluation system.**

With the rapid development and profound changes of politics, economy, science and technology, we have launched a vigorous change in China's education sector on the traditional teaching model. Our teacher bravely attempt to introduce the participatory teaching mode<sup>[3]</sup>, PBL teaching method, case teaching method, flip class teaching<sup>[4]</sup> and a variety of other teaching methods into chemistry class, so that the original teaching has been changed from the "offer fish" into the present "teaching fish". Naturally, teachers have been changed from the "class host" into the present "class guider", and students from the "passive learning" into "active learning."

We also make reform on the examination system where we only judge a student is good or not based on the score of a paper in the final exam ever before. It seriously makes students not to pay attention to the usual class and lab, just to the final examinations. They will only work hard in the last stage of every term to get high score, and even cheat in the exam for the final better result which destroys school spirit worse and worse. The new appraisal system is built up based on the principle of "pay attention to the usual, comprehensive evaluation". Student test scores  $\times 0.6$  + usual scores  $\times 0.4$ , and usual score include the usual class performance, thesis writing of usual small science, organic chemistry experiments and so on. Such reform, from a single examination system to multiple assessment system, makes school spirit better and better.

### **Focus on teaching reform, and realize green education and medical education**

Organic chemistry is a laboratory-based natural science which has to take corresponding reform when we run into reform of organic Chemistry. Our experimental reform is mainly reflected in the preparation of experimental materials, experiment projects, experimental methods, laboratory

reagents and so on. All members of the department of chemistry get involved in the preparation of experiment teaching material for medical students<sup>[5]</sup> and the general principles of our experiment is closely related to medicine and the environment friendly spirit. If some experiments have to be established but the raw material and the reagent are toxic, we will try to use micro or semi-micro experiments. Additionally, we will count the usual experimental scores to the usual scores of theoretical course, thus it can help avoid the phenomenon that student only highlights theory study but ignores the experimental operation.

### **Focus on the teaching staff construction and improve the overall quality of teachers**

Teacher is one of high-tech knowledge transfers and producers in the college, playing a decisive role with overall quality of the education level of teachers in the sustainable development. We attach great importance to the teaching staff construction to improve overall quality, and please refer to the following two main points:

#### **A. Focus on construction of teacher's morality**

"Teacher's morality prevails in the education, while education prevails the nationality" This sentence reflects the important role of ethics construction. Only teacher with lofty moral quality will be interested on their own education and care for their schools and students. We mainly construct the teacher's morality construction from aspects of "education skill, strong consciousness, model setup, positive orientation".

#### **B. Accelerate the training of young teachers**

Due to various reasons, teachers in our school are mostly young people between the ages of 30-40. The core of teacher's construction content in our school consists of developed effectiveness, progressive and sustainable development plans and fully enthusiasm mobilization of young teachers. We mainly take the policy of "talent output, talent attraction" in these year, encourage young teachers to work hard for On-the-job master and doctoral degree, and recommend teachers with a high level of business to make academic visits to major colleges and universities at home and abroad as "visiting scholar" for the study of research and teaching strength of other institutions. And we also encourage teachers to take in the light of declaration of various research projects and job promotion. Additionally, we use a variety of incentive policies to attract a number of key teachers, returnees, famous professors and so on.

### **Summary**

In recent years, we, from teaching and research section, actively explore the way of teaching reform for the development of Medical Organic Chemistry based on the characteristics of organic chemistry in order to meet certification requirements. What we struggle now is for the training of clinical medical personnel with high-quality international standards. The teaching reform of medical organic chemistry curriculum theory and experiment in our school has achieved certain results.

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