

A Simple Discussion on the Teaching of Suicide Substrate of Enzymes in Curriculum Ideological and Political Education

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Abstract: In this paper, the teaching of enzyme suicide substrate is compared with the understanding of sugar-coated cannonball terms put forward by Comrade Mao Zedong, so as to integrate the elements of ideological and political education into the teaching process of professional courses, and to improve the effectiveness of teaching and cultivating people.

1. Introduction

To cultivate people through the participation of all teachers and students throughout the entire teaching processes and covering all educational aspects, has become the important ways to cultivate builders of the socialist cause in China^[1-2]. This is the ideological and political education carried out in China. It was suggested that eight major ideological and political elements including professional identity, career ideals, humanistic sentiments, scientific spirit, healthy living, learning to learn, responsibility taking, and practical innovation should be incorporated into basic nursing course teaching^[1]. The Nobel Prize awarded to Youyou Tu has enabled the exploration of the academic spirit of Chinese scientists and the corresponding factors of technological and cultural confidence reflected in the older generation of scientists^[2-4]. However, all these were mentioned simply in the papers and can not be used as the teaching case. Using a knowledge point to construct a teaching case is very important to obtain better teaching effects.

2. An introduction to the suicide substrate of enzymes

The suicide substrate of enzyme is a kind of characteristic inhibitor among the irreversible inhibitors of enzyme, which is an interesting knowledge point. Generally speaking, inhibitors of enzymes often exert inhibitory effects by acting directly on enzyme proteins (a few by acting on co-factors). The suicide substrate inhibitors of enzymes appear as the substrate of enzymes. After the reaction catalyzed by the enzyme, a new produced substance appears as a "product". And this "product" can act on enzyme proteins or co-factors to inhibit the activity of the enzyme.

According to the summary of Xiaoling Zheng et al.^[4], further elaboration and schematic diagram on the mechanism of the suicide substrate of enzyme are as follows.

In normal enzymatic reaction, an enzyme (E) must first form a enzyme-substrate intermediate complex (E•S) with its substrate (S), and then further converts the substrate of the enzyme-substrate intermediate into the product (P):



But in the enzymatic reaction where a suicidal substrate (S_s) is catalyzed, the enzyme (E) first forms the enzyme-suicidal substrate intermediate complex (E•S_s) with the suicidal substrate (S_s), and then further converts the suicidal substrate into the "product" (I_s), which can directly inhibit the enzyme activity. That is to say, this "product" (I_s) is an inhibitor produced from the suicidal substrate (S_s) by the catalysis of the enzyme. The suicidal inhibition process of the enzyme can be indicated below:

inhibit



Here, the suicidal substrate(Ss) can not inhibit the enzyme (E) activity directly, but is like a delicious cookie for this enzyme. Because the "product" (Is),which can inhibit the enzyme (E) activity directly, is converted directly from the suicidal substrate(Ss) being catalyzed by the enzyme (E), the suicidal substrate(Ss) is dangerous for the enzyme (E) potentially and fraudulently.

3. Comparisons between the phenomenon of suicidal substrate of enzyme and the phenomenon of sugar-coated cannonballs

In the teaching process, in order to help students learn and to guide them to obtain relevant insights, we will introduce the concept of sugar-coated cannonball, which was solemnly put forward by Comrade Mao Zedong. In February 1949, before leaving for Beijing (now Beijing), the Party Central Committee held the second plenary session of the Seventh Central Committee of the Communist Party of China in Xibaipo, Pingshan County, Hebei Province, which is the last rural revolutionary base of the Chinese revolution stationed by the Party Central Committee. In the face of the new situation that the general trend of national victorious liberation had been set and the Communist Party of China was about to lead the people of the whole country to carry out construction works in all aspects, Mao Zedong predictably put forward the major issue of preventing the attack of "sugar-coated cannonballs " in the report of the Congress, emphasizing the need to strengthen the party's ideological construction and to guard against pride and the corrosion of bourgeois thought. In particular, he said "the support of the bourgeoisie may conquer the people of weak will in our team. There may be some Communists who had not been conquered by enemies with guns, and they deserved the title of heroes in front of these enemies; but they can't stand the attack of cannonballs wrapped in sugar coats by some people, and they will lose in front of the sugar-coated cannonball. We must prevent this situation."^[5].The sugar-coated cannonballs here essentially refer to those things that look delicious and fun, but will actually lead to human destruction. Those who want to obtain illegal benefits often use "sugar-coated cannonballs " to win over and corrupt leading cadres in special posts in order to meet their own extraordinary needs.In order to facilitate the teaching explanation, the phenomenon of suicidal substrate of enzyme will be compared with the phenomenon of sugar-coated cannonballs as follows.

For the time being, the following settings are made. 1) Reactants here include suicidal substrates and sugar-coated cannonballs respectively; 2) Catalysts here include enzymes ,Communist Party members who can withstand the test and Communist Party members who cannot withstand the test, respectively.

Table.1 Comparisons between the phenomenon of suicidal substrate of enzyme and the phenomenon of sugar-coated cannonballs

| | reactant | catalyst | reaction mechanism | reaction results |
|--|--------------------------|---|---|--|
| the phenomenon of suicidal substrate of enzyme | suicidal substrate | enzyme | The enzyme will catalyze the suicide substrate to react, producing the corresponding products. | The products will act on the enzyme and inhibit the activity of the enzyme . |
| the phenomenon of sugar-coated cannonballs | Sugar-coated cannonballs | Communist Party members who cannot withstand the test | The members will swallow the sugar-coated cannonballs being attracted by the sweetness of sugar and detonate the cannonballs. | The members have not the ability to recognize and defend, and will be killed by detonating the cannonballs. |
| | Sugar-coated cannonballs | Communist Party members who can withstand the test | The members will separate the sugar coating and the cannonball carefully, study their characteristics and the mutual relationship between the sugar coating and the cannonball, and find the method to prevent the sugar-coated cannonballs from exploding at last. | The members have the ability to recognize and defend, and will not be killed by preventing the sugar-coated cannonballs from exploding at all times. |

4. Discussion and conclusions

Through such teaching, students can be guided to connect the concept of suicide substrate with the concept of sugar-coated cannonballs, which can not only help students understand the concept of suicide substrate aided vividly by understanding the concept of sugar-coated cannonballs, but also can further guide students to understand that only through conscious learning and continuously improving their consciousness and cognitive ability can they consciously and effectively identify and resist the invasion of all kinds of transformed unhealthy tendencies and of thoughts and behaviors that violate the law and discipline, and can they not only avoid their own degeneration, but also can become the backbone to build a healthy, harmonious, civilized and beautiful society.

Through such analogy, students can connect the phenomena in natural science with those in social science, can broaden their horizons, can increase the dimension of their thinking, and can enhance their ability to compare each other, to inspire each other, to deepen memory and to deepen understanding. At the same time, they can integrate the study of history and revolutionary tradition of the Communist Party of China into the classroom study of professional courses, so as to improve the effectiveness of study to cultivate people.

Such classroom teaching will not take much time, nor will it occupy too much teaching time in professional courses, so it is feasible. At present, the teaching practice activities of curriculum ideological and political education have been spread out in colleges and universities all over China, to help better students establish a correct outlook on life and a correct sense of worth to help them grow healthily^[1-3,6-10].

So it is necessary to carry out curriculum ideological and political education in a classroom teaching activity showing above, to improve teaching quality further by promoting mutual inspiration between disciplines. Otherwise, in order to combine better the course contents with ideological and political education and to avoid teachers' applying mechanically in the classroom, causing the ideological and political education content to be disconnected from the knowledge points in class as mentioned by Shi et al^[2], a teacher should expand his/her reading range in order to grasp better the corresponding entry points in teaching.

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