

附件 4:

## 生物学国际博士研究生培养方案

授予学位类别:

一级学科(专业类别) 代码名称:

0710 生物学

二级学科(专业领域) 代码名称:

071000 生物学

071001 植物学

071002 动物学

071003 生理学

071004 水生生物学

071005 微生物学

071006 神经生物学

071007 遗传学

071008 发育生物学

071009 细胞生物学

071010 生物化学与分子生物学

071011 生物物理学

071012 生态学

071020 生物工程

071021 生物统计

0710J1 生物医学信息学

0710Z0 生物工程

0710Z1 生物统计

0710Z2 生物工程

0710Z3 生物医学工程与技术

制订单位：生命科学学院（牵头）、湘雅基础医学院、资源加工与生物工程学院（参与）

培养方案版本号：2020 版

## 一、学科概况

Biology involves the study of life and living organisms, including their physical and chemical structure, function, development and evolution. The biology in the Central South University (CSU) developed with the medical education in XiangYa Medical School established in 1914. It was originally set up for medical preparatory students in 1914. And in 1946, the Department of Biochemistry was founded in XiangYa medical school. Over the past century, we have raised a great number of famous scientists including Huilin Lu, Jiahui Xia, Bangzhe Ren, Youshang Zhang, Depei Liu, Hancheng Huang. We are authorized to issue the master and doctoral degree in Biology in 1977 and 1981, respectively. And in 1994, &nbsp;We set up the &nbsp;post-doctoral station in Biology. Biology is one of the key disciplines in the

national "211 project" and "985 project", and it is the key discipline in Hunan Province. The ESI subjects including Biology and Biochemistry, Molecular Biology and Genetics, Neuroscience and Behavior are among the top 1% in the world. Currently, we have the following talents, including one member of Chinese Academy of Engineering, two distinguished professors of "Changjiang Scholar", one scholar of "the thousand talents program" and two scholars of the "ten thousand talents program", two chief scientists of 973 project and eight selected as members of "the new century outstanding talent support program". In recent years, we have involved in such important national projects as 973, 863, and "national Major technology support project" and the national science foundation of china. We are the first one in China to store and use human genetic resources, and the researches on Neurodegenerative diseases and disease-causing genes have reached the internationally advanced level. We established the Branch of Medical Genetics in Clinical Medicine in China. Our purposes is to educate qualified personnel, who have an international perspective, devote

themselves in innovation and entrepreneurship in Biological Medicine. We conducted Basic and Applicable researches following the frontiers of the international technology and the nation's demand and regional economy,. We aim to make Biology a discipline of great international influence and distinguished features to improve the quality of the population and the standard of living.

## 二、研究方向

## 三、培养目标

(1) the basic knowledge for PhD candidates. PhD candidates should have a comprehensive knowledge, the core concepts and principles for Biology and related subjects, . They should systematically understand the history and the state quo of the research area, and be familiar with specific literature in Biology and master the main progress. PHD candidate should also master the background for conducting research independently. (2) Qualification for the PhD candidates 1. Academic qualification PhD

candidate should understand the theory in the forefront of Biology, and independently perform research, analyze data and have basic knowledge in intellectual property and research ethics.

2. Academic Morality PhD candidate must have a matter-of-fact and rigorous attitude and character of pursuing the truth, and strictly follow the academic standard. They have to ensure the experimental data are of great authenticity and enough evidence to support their ideas, and rigorous logic to reach a conclusion, and respect others' experiment achievements, intellectual property and life ethics.

The results in scientific papers and shared in academic conferences are supposed to be true according to their experiments, and they also need a correct recognition of others' accomplishments by precisely quoted in the thesis or reports. It is absolutely forbidden to steal others' work, fabricate data and deliberately provide inference which might mislead others.

(3) The basic academic abilities for PhD candidates

1. Ability to acquire knowledge PhD candidates can acquire the knowledge in relevant field, and design, carry out research and analyze the data, as well as communicate with peers.
2. Ability to identify academy PhD

candidates should be familiar with literature in related areas, and understand the ideas in the literature. They should understand the evidence and logic that the hypothesis based on, as well as the experimental design and protocol. They should be able to carry out experiments, analyze data and discuss the data, as well as compare with existed hypothesis. The PhD candidates should also apply for grant funding, read scientific journals in related field, and attend seminars regularly, report the progress, write the paper as and PhD thesis.

3. Ability for scientific research PhD candidates should master techniques in a specific area of Biology, including principle, the structure of necessary equipment, and quality control. They should be able to design and perform experiment to solve a specific question, collect and analyze data, and present data with appropriate tables or figures, and use correct statistic approaches, and interpret the data with appropriate models.

4. Ability for academic innovation The PhD candidates should have broad knowledge, innovation and imagination. Through communications with scholars from different areas, they are capable of posing new hypothesis that can be examined, or modifying the existing ones, and in the

meantime they can test these hypothesis through experimenting. They should actively carry out the original and exploratory research and try to explain new natural phenomena. The innovation ability is based on the close connection to peers and experts from other areas, one the discussion and debate on different opinions. PhD candidates should also engage in variety of academic activities and expand the horizons, and cooperate with scientists from other areas.

5. Ability for academic communication PhD candidates need work hard on developing skills such as logical debate, presentation and writing, in order to efficiently express their own ideas and exhibits their academic accomplishments. They should regularly report research progress, literature discussion and symposiums, prepare research materials for publishing and funds application. They should present in science organizations and academic conferences, and communicate with the reviewers of the journals during the publishing process. They should regularly attend the colloquium, and academic activities of disciplines and sub disciplines for no less than 12 times. After the finish their thesis, they should make a summary report in the Department before the official defense application. They should take part

in, at least once, the national or international academic conferences and give abstracts or oral presentations. 6. other abilities PhD candidates should be able to have teamwork ability, which enable them to get along well with colleagues, share and coordinate with each other.

#### 四、学制和学习年限

The duration of PhD program is 4 years. Outstanding students can graduate half a year in advance, according to the requirements in particular sub-disciplines. Their application materials should be publicly displayed. The longest duration is 7 years. The 31th August each year is the deadline for the largest duration.

#### 五、培养方式

1. The tutors are responsible for the training procedure, and ensure the quality. Several tutors may work in a group to train a student. 2. The tutor assists students in making study plans, choosing the courses, consulting literature, attending academic exchange, social practice, confirming the research subjects, and supervise the research. 3. In addition to the students'

study and research, the tutor would also take charge of their ideology and morality. The students are subjected to evaluation during every step of the program. And the unqualified students will be dismissed.

## 六、课程设置与学分要求

课程类别	学分要求	课程类别	学分要求
公共学位课	5	学科基础课	6
专业课	2	选修课	0
学术交流与研讨	8	培养环节	4
补修课	0		
总学分	25		
学分说明			

类别	课程编号	课程（环节）名称	学时	学分	开课学期	说明
公共学位课	1000000810 1	汉语	64	3	春秋季	
公共学位课	1000000810 2	中国概况	32	2	春秋季	
学科基础课	1812050120 3	学术诚信与论文写作	32	2	秋季	
学科基础课	2507001801	生物化学	32	2	秋季	
学科基础课	2507001802	生物化学实验	48	3	秋季	
学科基础课	2507100120 5	应用生物化学	32	2	秋季	

学科基础课	25071001801	基因组医学	32	2	春季	
学科基础课	25071011201	高级分子生物学	32	2	春季	
学科基础课	25071011206	分子生物学实验技术	36	2	春季	
学科基础课	25071011207	细胞结构与疾病	32	2	秋季	
学科基础课	25071011324	细胞生物学技术与实践	48	3	春季	
学科基础课	56071001209	生物化学前沿与进展(英文)	32	2	秋季	
学科基础课	56071011210	分子生物学研究方法与技术	32	2	春季	
学科基础课	56071011407	生物工程文献检索及论文撰写	32	2	春季	
学科基础课	65083111204	高级生物化学(全英文)	32	2	春季	
专业课	56071001208	微生物学前沿与进展	32	2	秋季	
专业课	65071011201	认知神经生物学(英文)	32	2	秋季	
专业课	65100101304	实用免疫学II(英文)	24	1.5	秋季	
专业课	65100111304	实用免疫学I(英文)	16	1	秋季	
专业课	69100411110	临床流行病学	32	2	秋季	
专业课	69100411112	医学统计学A(科学学位)	48	3	秋季	
专业课	69100411502	毒理学实验技术与方法	24	1.5	春季	
专业课	69100418116	医学统计学C	32	2	秋季	
专业课	69120411711	医学社会科学研究方法A	24	1.5	秋季	
专业课	6912041271	医学社会科学研究	16	1	秋季	

	2	究方法 B				
学术交流 与研讨	0000000050 2	学术交流与研讨 (学术学位博士 生)		8	春秋季	
培养环节	0000000060 3	科研训练		1		
培养环节	01	博士生资格考试		1		
培养环节	02	开题报告		1		
培养环节	03	中期考核		1		

## 七、学术研讨与学术交流

They are compulsory for all doctoral students (including part-time ones). Accomplish the following 4 tips, the credits(8 in total) can be obtained.

1. Regularly attend the seminars of their research groups and make records. With the agreement of the tutor, 4 credits can be obtained.
2. Attend academic activities for disciplines and sub-disciplines of all sort for no less than 12 times. (2 credits)
3. They should make a summary report of the thesis advance and between the its accomplishment and the official defense application. (1 credit)
4. Take part in, at least for one time, the national of international academic conferences of the discipline and make a presentation or publish a summary. (1 credit)

Finish a summary and

fill out ‘the Record of Academic Activities for doctoral students’. Keep them after signed by the organizer and hand to certain departments when applying for the two credits.

## 八、博士生资格考试

According to the ‘regulations on the qualifications examination for doctrinal students’ (中大研字〔2014〕22号), doctoral students need obtain the credits specified above, and pass the tests, thus they get access to the part of the doctoral thesis.

## 九、学位论文开题报告

Doctoral students should, guided by the tutor, confirm their search direction of the thesis, and then thesis topic, based on a great number literature. Doctoral students, passing the qualification test, can make public thesis report, and those who fail have another chance in a year.

## 十、中期考核

所有博士生必须参加中期考核，培养方案中明确具体要求，并按《中南大学研究生培养环节工作管理办法》实施。各二级培养单位可根据本单位实际情况和研究生培养质量保障需要，决定硕士生是否参加中期考核，并在相关培养方案中明确具体要求。

## 十一、科研训练、专业实践和社会实践

## 十二、学年总结与考核

There is an annual summary and assessment before the winter holiday for doctoral students about their political and ideological performance, grades of their courses, scientific research and practice. The results play a role in superior evaluation and screening. Those who fail the assessment will be punished in accordance with the regulations.

## 十三、学位论文工作

International doctoral students who are taught in English can finish their thesis and the debate in English, but the abstract should be written in

Chinese. The defence&nbsp;application and procedure should refer to the regulations on degree conferring for graduates&nbsp;in CSU. 1. The criterion of publishing research paperDoctoral students need publish papers in national or international journals, which is cumulatively no less than 3 points. (6 points for JCR I paper, 3 points for JCR II paper, 1 point for JCR III paper) . The research paper must be the original paper which are closely related with the thesis research, with CSU the first holder. They ought to be the first author. Co-authors (no more than 2) share half of the points. 2. The requirement for the thesisRefer to The Regulation on the Degree Conferring in CSU (中大研字 (2009) 7号) &nbsp;and The Regulation on the Thesis Writing for doctoral students in CSU. 3. The thesis valuation, defense, and degree issuingDoctoral students, who have obtained the credits specified above, and finished the thesis valuation, can apply for the thesis defense once it is approved by the tutor. Once they passed the defense, they are able to receive the graduate certificate. Those who pass the thesis defense can apply for the PhD degree. The Academic Degree Evaluation Committee will evaluate and issued&nbsp;the diploma to &nbsp;qualified candidates.

#### 十四、毕业论文工作

International doctoral students who are taught in English can finish their thesis and the debate in English, but the abstract should be written in Chinese. The defence&nbsp;application and procedure should refer to the regulations on degree conferring for graduates&nbsp;in CSU. 1. The criterion of publishing research paper Doctoral students need publish papers in national or international journals, which is cumulatively no less than 3 points. (6 points for JCR I paper, 3 points for JCR II paper, 1 point for JCR III paper) . The research paper must be the original paper which are closely related with the thesis research, with CSU the first holder. They ought to be the first author. Co-authors (no more than 2) share half of the points. 2. The requirement for the thesis Refer to The Regulation on the Degree Conferring in CSU (中大研字〔2009〕7号) &nbsp;and The Regulation on the Thesis Writing for doctoral students in CSU. 3. The thesis valuation, defense, and degree issuing Doctoral students, who have obtained the credits specified above, and finished the thesis valuation, can apply for the

thesis defense once it is approved by the tutor. Once they passed the defense, they are able to receive the graduate certificate. Those who pass the thesis defense can apply for the PhD degree. The Academic Degree Evaluation Committee will evaluate and issued the diploma to qualified candidates.

附：修订专家名单

Zhang Zhuohua, Xia Kun, Liang Desheng, LI Jiada, Liu Jing, He Hailun, Xia Zanxian, Xiang Rong