

Open FIESTA 国际开放创新教育中心

精准医学与公共健康专业

Master of Precision Medicine and Public Health

清华大学-法国巴黎交叉科学研究院交叉生命科学前沿双硕士学位项目

BIO³ Life Technology Program: Interdisciplinary Life Science Frontiers

Master Program provided jointly by THSIGS and CRI

(仅适用于 2019 级学生/ for students enrolled in 2019)

一、适用学科、专业/Applicable disciplines, majors

精准医学与公共健康 (BIO³ 生命技术方向) (交叉学科, 工学门类) (学科代码 99J4)。

BIO³ 生命技术硕士学位项目作为交叉创新人才培养项目, 拟录取学生方向包括:

生物学、物理学、数学、化学、医学、生物医学工程、材料科学与工程、电子科学与技术等。

Precision Medicine and Public Health (BIO³Life Technology) (Interdisciplinary, Engineering)
(Subject Code 99J4).

The BIO³ Life Technology Master Program aims to prepare graduates in an interdisciplinary innovative program. Qualified students major in biology, physics, mathematics, chemistry, medicine, biomedical engineering, material science and engineering, and electronic science and technology, etc.

二、培养目标/ Mission

培养具有国际视野、探索精神、在交叉生命学科领域有较高的理论水平以及综合解决跨学科问题能力的复合型专业人才, 有潜力在交叉生物学科及相关领域攻读更高学位, 或在交叉生命科学相关的新兴产业中成为优秀的科研或创新创业人才。

This program is dedicated to cultivate a combination of professionals with international vision, exploration spirit, high theoretical level in cross-disciplinary fields, and comprehensive

interdisciplinary problem-solving skills. It has the potential to pursue higher degrees in cross-biology and related fields, or become excellent researchers or innovative entrepreneurs in life-science related industries.

三、学习年限与学位设置/ Length of study and degree

采用全脱产的培养方式。基本学习年限两年至三年。按照以下两种方式的一种设置。

1、全程在清华大学学习，学制两年至三年。完成各培养环节，并满足清华大学硕士学位授予要求的学生将被授予清华大学“精准医学与公共健康”专业学术型硕士学位。

2、第一学年在清华大学学习，第二学年全年在法国巴黎交叉科学研究院和巴黎第五大学学习，第三学年回到清华学习，学制三年。完成各培养环节，并同时满足清华大学和巴黎第五大学硕士学位授予要求的学生，可获得清华大学与巴黎第五大学双硕士学位。只满足清华大学硕士学位授予要求的学生，则只授予清华大学学位。

This is a 2 to 3 years full-time program with the following two options.

1. Studying at Tsinghua University for 2 to 3 years, students who complete the required credits and meet the Tsinghua University Master's degree requirements will be awarded a Master's degree in Precision Medicine and Public Health.

2. Studying at Tsinghua University during the first academic year, followed by studying at the Interdisciplinary Research Institute of Paris or the Fifth University of Paris during the second year, and at last, returning to Tsinghua University for the third year. Students who complete the required credits and meet the requirements for master's degrees both at Tsinghua University and Paris Fifth University will receive a double master's degree from the two universities. Students who only meet the Tsinghua University Master's degree requirements, can only be awarded a master's degree from Tsinghua University.

四、培养方式/ Training mode

本硕士研究生项目实行导师负责制，在由不同专业老师组成的跨学科导师小组共同指导下，从事交叉生命科学、人工智能辅助诊疗、健康大数据及医疗手术机器人等领域的学习和研究。培养环节主要包括：强化营学习、课程学习和轮转项目实践。

This master's program implements advisor responsibility system. An interdisciplinary team of instructors from different disciplines directs students to engage in interdisciplinary life science, artificial intelligence-assisted diagnosis, big data, medical robotics, etc. Training mainly include: boot-camp learning, curriculum learning and rotation project practice.

五、学位学分要求/ Degree credit requirements

硕士生在学习期间，需获得学位要求学分不少于 33 学分，其中公共必修课程学分 5（国际学生学分不少于 4），交叉学科基础课程 3，专业核心课程不少于 9，专业选修课程不少于 4，职业素养课不少于 2，必修环节 10。

Master's degree requires no less than 33 credits, including 5 credits of required public courses (no less than 4 credits for international students), 3 credits of interdisciplinary fundamental courses, no less than 9 credits of major core courses, no less than 4 credits of major elective course, no less than 2 credits of the career development courses, and 10 credits of required training activities.

六、课程设置与培养环节/ Curriculum and Training

1. 公共必修课程/ Required Public Courses

A. 适用于中国学生（5 学分）/ for Chinese students (5 credits)

- 中国特色社会主义理论与实践研究 (60680012) 2 学分（考试）
- 自然辩证法概论 (60680021) 1 学分（考试）
- 硕士生英语 (64200012) 2 学分（考试）

备注：港澳台学生公共必修课学分要求按照学校有关规定执行。

B. 适用于国际学生（ ≥ 4 学分）/ for international students (≥ 4 credits)

- 中国概况课/China Profile courses (00000007) 2-3 学分/ credits (exam)
- 汉语 第一外语类/Chinese Language (0000002) 2 学分/credits (exam)

备注：国际学生公共必修课学分要求按照学校有关规定执行。

Tips: Credits of required public courses for international students are according to the relevant regulation of Tsinghua University.

2. 学科专业课程（ ≥ 18 学分）/ Major Courses (≥ 18 credits)

(1) 强化营：交叉学科基础课程/Boot-camp : Interdisciplinary foundation courses

(3 学分/credits)

- 生物学概论（非生物与医学背景学生）/Boot-camp : Fundamental Biology (for students without biological and medical background knowledge) (72917073) 3 学分/credits(考查/non-exam)

- 数理方法与仪器科学概论 (生物、医学类背景学生) /Boot-camp : Mathematics, physics and scientific equipment(for students with biological and medical background knowledge)

(72917043) 3 学分/credits (考查/non-exam)

(2) 核心课程/Core courses (≧9 学分/ credits)

- 医学科学研究 /Science and Medicine (82917002) 2 学分/credits (考试/exam)
- 计算生物学 /Computational Biology (82917022) 2 学分/credits (考试/exam)
- 微纳米生物技术/Micro- and Nano-Biotechnology (72917062) 2 学分/credits (考试/exam)
- 生物物理导论/Introduction to Biophysics (82917031) 1 学分/credits (考试/exam)
- 生物物理实验方法/Experimental Methods in Biophysics (82917042) 2 学分/credits (考查/non-exam)
- 信息与通信技术/Information and Communication Technology (82917052) 2 学分/credits (考试/exam)
- 合成生物学/Synthetic Biology (82917013) 3 学分/credits (考试/exam)
- 科学实验分析/Scientific Experiment Analysis (新开课/new) 2 学分/credits (考试/exam)
- 生物医学光学/Biomedical Optics (84000182) 2 学分/credits (考试/exam)
- 生物医用材料/Biomedical Materials (84008062) 2 学分/credits (考查/non-exam)

(3) 选修课程/ Elective Course (≧4 学分/ credits)

- 分子细胞生物学进展/Advanced Course on Cell and Molecular Biology (80450263) 3 学分/credits (考试/exam)
- 大数据科学与应用系列讲座/Big Data Science and Application Seminar Series (60250131) 1 学分/credits (考试/exam)
- 大数据机器学习/Big Data Machine Learning (70240403) 3 学分/credits (考试/exam)
- 生物光子学实验/ Bio-photonics experiment (新开课/new) 2 学分/credits (考查/non-exam)
- 化学生物学/Chemical Biology (70440253) 3 学分/credits (考试/exam)
- 导师组指定的其它专业课程/ Other professional courses designated by the mentor team (0000003)

3. 职业素养课程(≧2 学分) / Career Development Course(≧2 credits)

课组号/ Course group No. : 00000005

- 生命职业伦理与科学道德规范 (必修) /Life Professional Ethics and Scientific Ethics
(required) (60450021) 1 学分/credits (考试/exam)
- 创业启蒙/Entrepreneurial enlightenment
(60510042) 2 学分/credits (考查/non-exam)
- 品牌形象战略与设计/Brand strategy and image design
(70807052) 2 学分/credits (考试/exam)
- 企业组织与管理实践研究/Studies on Organizational Theory and Management Practice
(80514842) 2 学分/credits (考查/non-exam)

4. 必修环节 (10 学分) /Required Training Activities (10 credits)

(1) 文献综述与选题报告/ Literature Review and Thesis Proposal

1 学分/credits (考查/non-exam)

(2) 学术活动/ Academic Activities

1 学分/credits (考查/non-exam)

(3) 轮转项目/Rotation

8 学分/credits

- 生物医学与信息学实验 (轮转 1) /Biomedical and informatics experiments
(rotation 1) (62917064) 4 学分/credits (考查/non-exam)
- 生物制造实验 (轮转 2) /Biological manufacturing experiment (rotation 2)
(62917074) 4 学分/credits (考查/non-exam)
- 生物纳米检测技术实验 (轮转 3) /Biological nano-detection technology
experiment (rotation 3) (62917084) 4 学分/credits (考查/non-exam)
- 医学与生物学实验 (轮转 4) /Medical and biological experiments (rotation 4)
(62917094) 4 学分/credits (考查/non-exam)

七、学位论文/ Thesis

提交学位论文一篇，论文应突出前沿性、交叉性与创新性。论文须如实反映自己所做的研究工作和学术水平，表明作者在相关及交叉学科领域掌握了系统的专业知识，并具有从事学术研究和独立开展项目实践的能力。

按照学校相关规定，完成开题和论文工作。由校内外专家组成答辩委员会进行论文答辩，决定论文是否达到学位要求。对学位论文相关创新成果的要求，参见本学科（项目）适用于 2019 级研究生的创新成果要求。

All BIO³ students are required to complete a thesis, which should focus on frontier, interdisciplinary and innovative subjects in precision medicine and public health related areas. Development of a master's thesis is an ongoing process during the student's academic program, demonstrating the student's ability of mastering required systematic knowledges and engaging independent research projects.

According to the regulations of Tsinghua University, all students must complete the thesis proposal defense and thesis defense. A committee of experts from both inside and outside Tsinghua will attend the defense and evaluate the thesis to determine if it meets the degree requirements. Please refer to the attachment of Innovative Outcome Requirements for the thesis.

Attachment

清华大学深圳国际研究生院国际开放创新教育中心

精准医学与公共健康 (BIO³ 生命技术方向)

研究生申请学位创新成果基本要求

(经清华大学学位评定委员会 2019 年第**次全体会议审议通过)

Open FIESTA — Precision Medicine and Public Health — BIO³

Master's Degree requirements for innovative outcome

Reviewed and approved at the **th plenary meeting of the Tsinghua University Degree Evaluation

Committee in 2019

根据《清华大学关于完善学术评价制度的若干意见》（清委发〔2019〕11号），特制定申请本学科（项目）学位创新成果要求如下：

This master's degree requirements for innovative outcome is according to "Several Opinions of Tsinghua University on Improving Academic Evaluation System" ([2019] No. 11):

一、适用范围/Scope of application

本要求适用于以下学科/专业类别/项目研究生申请博士或硕士学位：

精准医学与公共健康（BIO³ 生命技术方向）学术型硕士学位

This requirement applies to the students of following disciplines / majors / programs to apply for doctoral or master's degree:

Master of Precision Medicine and Public Health (BIO³ Life Technology)

二、创新成果的主要形式和认定标准/Main forms and criteria for innovative outcome

学生申请学位创新成果的形式为已接收或发表的 SCI、EI 检索或中文核心期刊论文、学术会议论文，已公开或授权的发明专利和软件著作权。

要求成果内容需与本学科或学位论文相关；我校需为第一署名（完成）单位；学生需为第一作者（完成人）或导师为第一作者（完成人），学生为第二作者（完成人）（SCI检索论文可放宽至排名第二位且与排名第一位同等贡献的学生）。

This innovative outcome should either be an SCI, EI or Chinese core journal papers, conference papers, published or licensed invention patents and software copyrights that have been accepted or published.

The content of this innovative outcome should be related to Precision Medicine and Public Health (BIO³ Life Technology) or the thesis; Tsinghua University must be the first ownership; the student must be the first author, or the advisor is the first author, the student is the second author (SCI papers can be the second author who contributes the same as the first author).

三、申请硕士学位的创新成果基本要求/Details of Master's degree requirements for innovative outcome

申请学术型硕士学位，应满足以下条件之一：

You must provide one of the following outcomes when applying for master's degree:

1. 已接收或发表的 SCI、EI 检索或中文核心期刊学术论文（全文）；

Received or published SCI, EI or Chinese core journal academic papers (full text);

2. 已发表或被录用的学术会议论文（全文）；

Published or accepted conference papers (full text);

3. 已提交专利申请并获得受理通知书的发明专利（专利证书或专利申请接收函）；

Patented Invention (paten certificate or patent acceptance letter);

4. 已注册的软件著作权（软件著作权证书）。

Registered software copyright (certificate).

四、创新成果审核办法/Review method of Innovative outcome

具体流程:由学生本人填写《清华大学 Open FIESTA 申请硕士学位创新成果审批表》，经导师签字后在学位论文预答辩会前一周提交至中心教务处。由中心组织专家小组对提交的创新成果讨论审议。

Process: Students shall complete the “Approval Form for the Innovative outcomes of Open FIESTA”, which will be submitted to the Center's Academic Affairs Office a week before the pre-

thesis defence. Open FIESTA will organize experts conference to discuss and review the submitted innovative outcomes.

主责人员：项目首席教授

The main person in charge: Chief professor of BIO³ Life Technology

具体要求/Specific requirements :

1. 填报已发表的 SCI 或 EI 检索学术期刊论文格式为：作者，论文题目，期刊名称，发表年份，卷(期)，页码（编号）。SCI 或 EI 索引号，IF 值。同时需提交 pdf 版论文原文为附件；

Fill in the published SCI or EI paper format: author, paper title, journal name, publication year, volume page number. SCI or EI index number, IF value. At the same time, the pdf version of the original paper must be submitted as an attachment;

2. 填报已接收的 SCI 或 EI 检索学术期刊论文格式为：作者，论文题目，期刊名称。已接收，SCI 或 EI 检索，IF 值。同时需提交 pdf 版论文原文和论文接收函为附件；

Fill in the accepted SCI or EI paper format: author, paper title, journal name. Received, SCI or EI retrieved, IF value. At the same time, it is necessary to submit the pdf version of the original paper and the acceptance letter of the paper as an attachment;

3. 填报已发表或接收的会议论文格式为：作者，论文题目，会议名称，会议所在城市，会议所在国家，会议时间。同时需提交 pdf 版论文原文和论文接收函为附件。大会获奖论文可提供相应证明文件为附件；

Fill in the format of the conference papers that have been published or received: author, paper title, conference title, city where the conference is held, country where the conference is held, and conference time. At the same time, one must submit the pdf version of the original paper and the acceptance letter of the paper as an attachment. The winning papers of the conference can be provided with the corresponding supporting documents as attachments;

4. 填报发明专利格式为：申请者，专利题名，专利国别，专利文献号（公开号）[P]，专利类型，公告或公开日期[引用日期]。对于已公开未授权的发明专利，需同时提交专利申请书和相关证明文件为附件；

Fill in the format of the invention patent is: applicant, patent title, patent country, patent document number (publication number) [P], patent type, announcement or publication date [reference date]. For invention patents that have been published but not authorized, it is necessary to submit the patent application and related supporting documents as attachments at the same time;

5. 填报软件著作权格式为：著作权人，软件名称，证书号，登记时间。同时需提交计算机软件著作权登记证书复印件为附件。

Fill in the software copyright format: copyright owner, software name, certificate number, registration time. At the same time, a copy of the computer software copyright registration certificate must be submitted as an attachment.

表决方式：中心将组织专家评定小组对学生提交的创新成果申请进行集中讨论审议。评定小组由不少于 5 位相关学科教师组成，其中高级职称教师人数不少于 2/3。同意票数不少于评定小组总人数的 2/3 视为该成果达标。

Voting method: Open FIESTA will organize an expert assessment team to discuss and review the application for innovative outcomes submitted by students. The assessment team consists of no less than 5 experts in related disciplines, in which no less than 2/3 have senior title. The innovative outcome being evaluated as meeting the requirements needs no less than 2/3 of the experts voted in favor.

五、附则/Supplementary

- 1、本文件自通过之日起生效，适用于 2019 级（含）以后入学的研究生。

This document take effect from the date of adoption , it is effective for the graduate students enrolled in and after the year of 2019 .

- 2、2018 级（含）以前入学的在校研究生，可执行入学当年有关要求或本要求。

Students who have enrolled in and before the year of 2018 should refer to the requirements for the year of enrollment or this requirement.

- 3、在本文生效之前已经毕业、结业但未获得学位的研究生，根据规定可申请学位的，在申请学位时执行入学当年有关要求。

Students who have graduated or graduated without a degree, should refer to the relevant requirements for the year of enrollment when applying for a degree.

4、本文件解释权归交叉学科学位工作委员会。

The Interdisciplinary Degree Working Committee of Tsinghua University has the right to interpret this document.