



# NAZARBAYEV UNIVERSITY

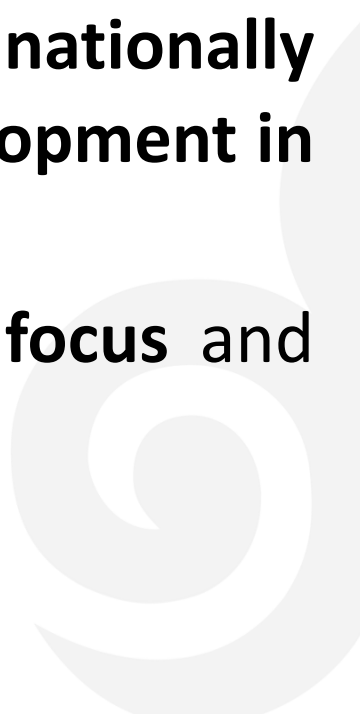


# **M.Sc. in Biological Sciences and Technologies Program Orientation**

**Department of Biology**  
School of Sciences and Humanities



## *Program objectives*

- The program aligns with the Modernization 3.0 strategy to **train a professional, competitive workforce able to succeed nationally and internationally** and to **promote research and development in Kazakhstan**.
  - Unique in Kazakhstan because of its **interdisciplinary focus** and **integrated research, teaching and innovation** approach.
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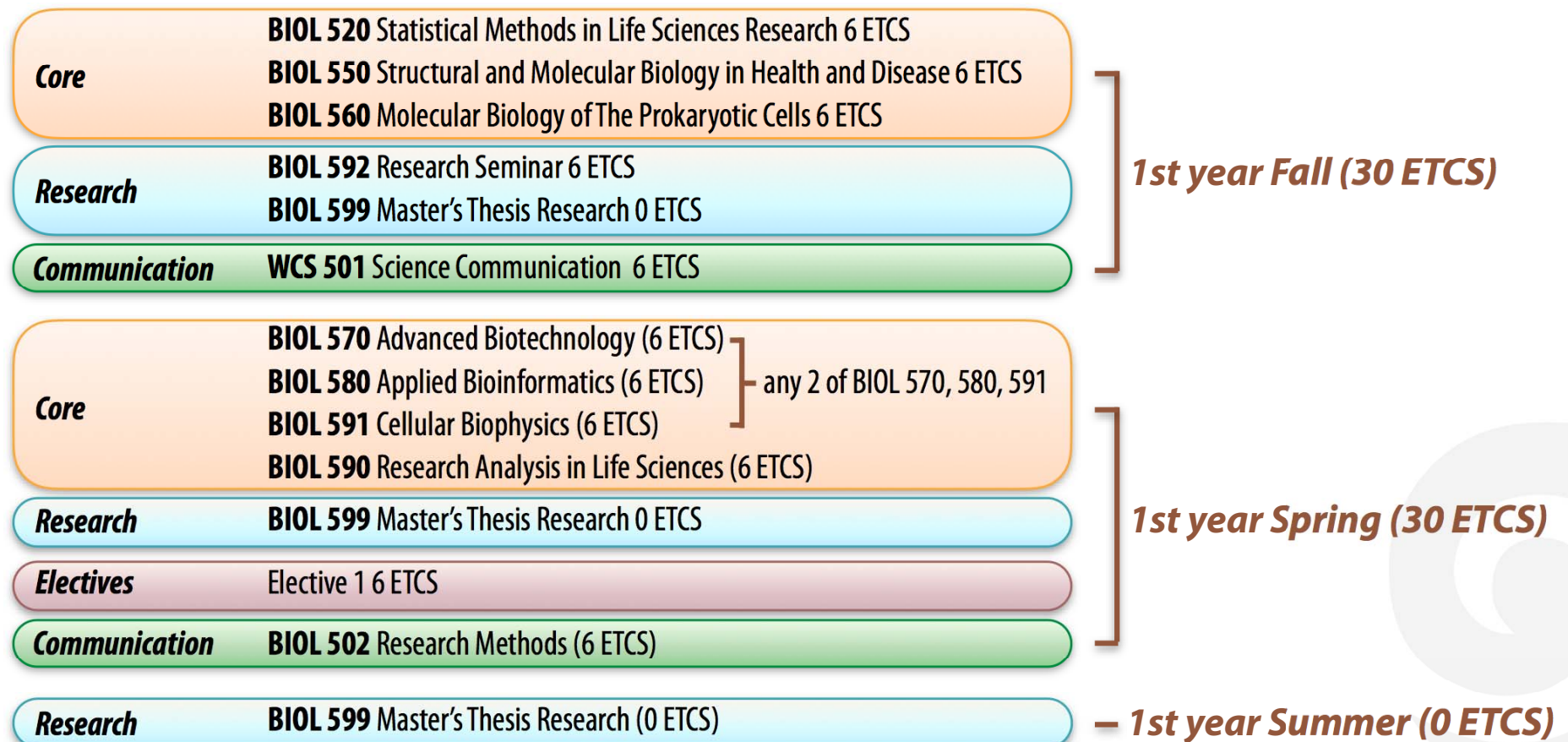
## ***Program Structure and Academic Content***

- The program complies with *Qualifications Framework of the European Higher Education Area* (Bologna Working Group, 2005)

[http://ecahe.eu/w/index.php/Framework\\_for\\_Qualifications\\_of\\_the\\_European\\_Higher\\_Education\\_Area#Second\\_cycle\\_-\\_Master.27s\\_level](http://ecahe.eu/w/index.php/Framework_for_Qualifications_of_the_European_Higher_Education_Area#Second_cycle_-_Master.27s_level)

- 2 years, Cycle 2, Level 7, 120 ECTS
- The curriculum of the program consists of three different types of courses:
  - core pillar courses (18+ ECTS),
  - elective pillar courses (24 ECTS), and
  - research pillar courses (Thesis Research and Thesis Dissertation; 180 ECTS).

## Program Structure and Academic Content



## *Program Structure and Academic Content*

|                         |  |   |
|-------------------------|--|---|
| <b><i>Electives</i></b> | Elective 2 6 ETCS<br>Elective 3 6 ETCS<br>Elective 4 6 ETCS<br>Elective 5 6 ETCS                   | } <b><i>2nd year Fall (30 ETCS)</i></b>   |
| <b><i>Research</i></b>  | <b>BIOL 599</b> Master's Thesis Research 0 ETCS<br><b>BIOL 691</b> Master's Thesis Proposal 6 ETCS |   |
| <b><i>Research</i></b>  | <b>BIOL 692</b> Master's Thesis (30 ETCS)  | <b><i>– 2nd year Spring (30 ETCS)</i></b> |

## ***Program Structure and Academic Content***

### ***List of Departmental Graduate Elective Courses***

***Electives***

**BIOL 623** Advanced Immunology

**BIOL 630** Advanced Neuroscience

**BIOL 631** Synthetic Biology

**BIOL 632** Drug Discovery and Design

**BIOL 633** Environmental Systems and Environmental Toxicology

**BIOL 634** Advanced Cancer Biology

**BIOL 635** Hot Topics in Life Sciences

**BIOL 637** Advanced Optical and Electron Microscopy

**BIOL 637L** Advanced Optical and Electron Microscopy Lab

**BIOL 670** Gene Therapy

**BIOL 675** Regenerative Medicine

**BIOL 504** Commercialization of Bioscience Research

***offered in 2020***

***offered in 2020***

***offered in 2020***

***offered in 2020***

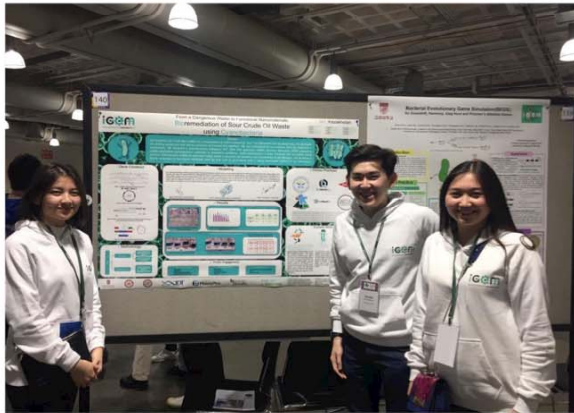








- Internships
- Laboratory facilities
- Research
- International competitions/conferences



**Biology students in iGEM  
competition in Boston, USA,  
2018**



**Biology students at summer  
research internship in China,  
2018**



**Chemistry students at  
conference in China,  
2019**



**MA students and professors at  
Conference in Zurich, 2015**

## Research areas

1. **Biology of disease** including molecular basis of cancer, infectious diseases (tuberculosis), autoimmunity (rheumatoid arthritis) and neurological diseases
2. **Biophotonics** applied in cell and **environmental systems**
3. **Biotechnology** and **Bioinformatics** including nanoparticle delivery systems, biosensors, biological data-mining, biomarker and drug target discovery.

## Papers hot of the press... (as of July 2020)

### [Considering the Experimental use of Temozolomide in Glioblastoma Research.](#)

Herbener VJ, [Burster T](#), Goreth A, Pruss M, von Bandemer H, Baisch T, Fitzel R, Siegelin MD, Karpel-Massler G, Debatin KM, Westhoff MA, Strobel H. Herbener VJ, et al. *Biomedicines*. 2020 Jun 4;8(6):151. doi: 10.3390/biomedicines8060151. *Biomedicines*. 2020. PMID: 32512726 [Free PMC article](#). Review.

### [YAP Mediates Hair Cell Regeneration in Balance Organs of Chickens, But LATS Kinases Suppress Its Activity in Mice.](#)

Rudolf MA, [Andreeva A](#), Kozlowski MM, Kim CE, Moskowitz BA, Anaya-Rocha A, Kelley MW, Corwin JT. Rudolf MA, et al. *J Neurosci*. 2020 May 13;40(20):3915-3932. doi: 10.1523/JNEUROSCI.0306-20.2020. Epub 2020 Apr 27. *J Neurosci*. 2020. PMID: 32341094

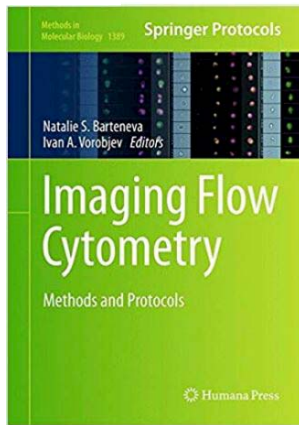
### [Nicotinic Acetylcholine Receptors of PC12 Cells.](#)

Mussina K, Toktarkhanova D, [Filchakova O](#). Mussina K, et al. *Cell Mol Neurobiol*. 2020 Apr 25. doi: 10.1007/s10571-020-00846-x. Online ahead of print. *Cell Mol Neurobiol*. 2020. PMID: 32335772 Review.

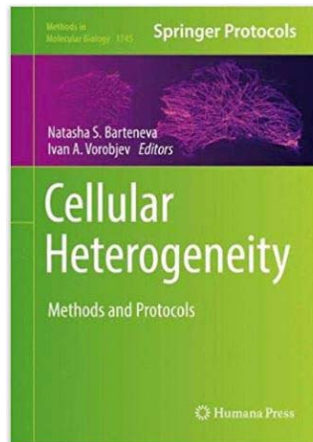
### [The Role of Telomerase in Radiation-Induced Genomic Instability.](#)

[Nuta O](#), Rothkamm K, Darroudi F. Nuta O, et al. *Radiat Res*. 2020 May;193(5):451-459. doi: 10.1667/RR15495.1. Epub 2020 Mar 9. *Radiat Res*. 2020. PMID: 32150497

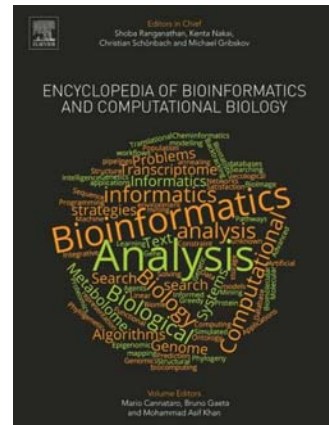




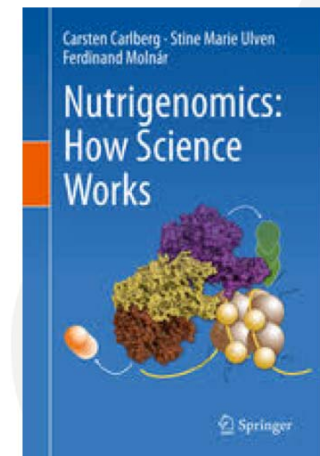
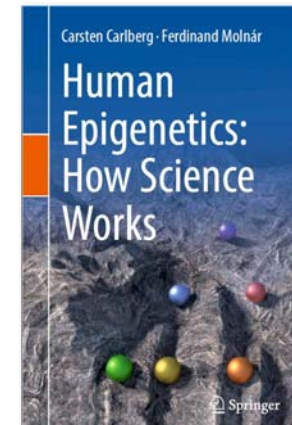
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ISBN-10: 1493933000



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ISBN-10: 1493976796



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ISBN-10: 0387729674





## New C4 research building

1. Biology Cluster (Core Facilities: Electron microscopy; flow cytometry; high-end fluorescent microscopy etc.)
2. Cluster of Fundamental Sciences (accelerator)
3. Ecological Cluster (EREC-Environmental Sciences etc.)







**Christian Schoenbach**  
Department Chair



**Natalie Barteneva**  
Full Professor



**Gonzalo Hortelano**  
Full Professor



**Ivan Vorobyev**  
Full Professor



**Dos Sarbassov**  
Full Professor

*5 Full Professors, 6 Associate Professors,  
8 Assistant Professors*

*CONTACTS: [name.surname@nu.edu.kz](mailto:name.surname@nu.edu.kz)*



**Yerlan Ramankulov**  
Associate Professor



**Jeannette Kunz**  
Associate Professor



**Timo Burster**  
Associate Professor



**Ferdinand Molnár**  
Associate Professor



**Tursonjan Tokay**  
Associate Professor



**Yingqiu Xie**  
Associate Professor



**Assem Duisembekova**  
Instructor



**Zhanat Muminova**  
Assistant Professor



**Otilia Nuta**  
Assistant Professor



**Anara Zhumadilova**  
Assistant Professor



**Anna Andreeva**  
Assistant Professor



**Olena Filchakova**  
Assistant Professor



**Damira Kanayeva**  
Assistant Professor

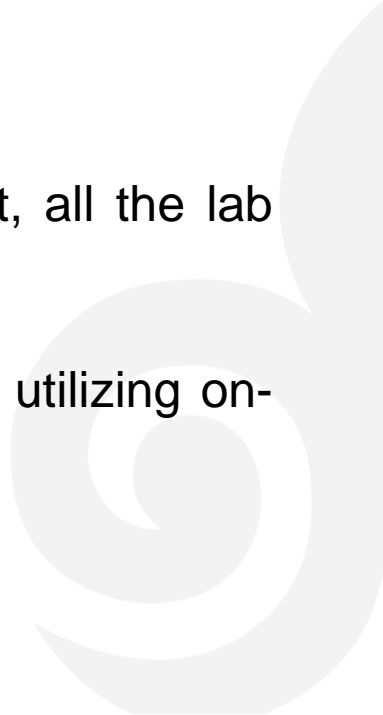


**Chethan Purushothama**  
Assistant Professor



**Tri Pham**  
Assistant Professor

## COVID-19 related deviations in the delivery of the program in Fall 2020

- All lecture courses are delivered on-line.
  - In the current program there are no courses that require laboratory part, all the lab components shall come from your MSc thesis research project.
  - All assessments incl. exams are conducted on-line with several courses utilizing on-line proctoring services to prevent cheating during exams.
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## Program Completion Requirements

To progress towards degree granting, students have to

1. pass each course with at least a B-,
2. complete the course-work requirements (90 ECTS), including retaking any failed discipline core courses in three semesters,
3. submit a research proposal, present it orally and have it approved before the end of the third semester in the program, and
4. complete and submit the research thesis (30 ECTS) to the thesis committee and defend the thesis before the end of the fourth semester.

Extension of the coursework period beyond three semesters and extension of the enrollment period beyond four semesters shall require the approval from the Department, SSH, and NU's graduate committee

## Partnerships

### *International Partnerships*

- Tsukuba University, Japan
- National Institute of Genetics, Japan
- Jiao Tong University, China
- Tsinghua University, China

### *Local Partnerships*

- Antituberculosis Dispensary, Nur-Sultan



## Information and Contacts

### **SSH Student Affairs Office**

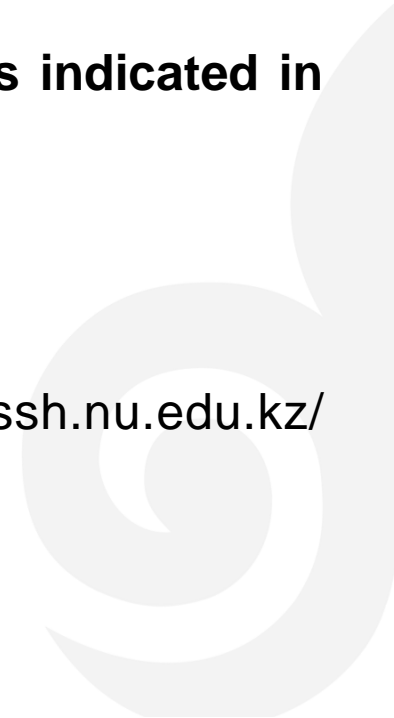
<https://ssh.nu.edu.kz/students/student-support/>

**Course-related questions should be addressed to course instructors as indicated in the Fall 2020 schedule**

<https://registrar.nu.edu.kz/course-schedules>

### **Department of Biology**

<https://research.nu.edu.kz/en/organisations/departments-of-biology> <https://ssh.nu.edu.kz/faculty/?fname=&depid=593>





[www.nu.edu.kz](http://www.nu.edu.kz)