Course Title (in English) | Molecular Biology Seminar - CRISPR - the beginnings
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Course Title (in Russian) | Молекулярная биология; семинар
Lead Instructor(s) | Severinov, Konstantin

Status of this Syllabus | The syllabus is a work in progress (draft)
Contact Person | Konstantin Severinov
Contact Person’s E-mail | K.Severinov@skoltech.ru

1. Annotation

Main topic of term-2 seminar will be “CRISPR - the beginnings”

For each class, there will be a paper that two people will present to the rest of the class. We will go down to the details of experiments - how things were done and what do the data/figures really show, so be prepared to answer in-depth questions. Presenters will start by stating the name of the paper/main authors and telling the take home message of the paper - why it is significant, what problem it solved. Then they will proceed to the actual work. If there are methods/results mentioned in the paper that refer to prior work, you shall be prepared to answer questions about it too. The audience is supposed to read the paper being discussed beforehand and participate in discussions.

To pass, one would need to present a paper at least once during the module and actively take part in discussions of other papers. One absence is allowed no questions asked. Additional absences when unexplained will be a cause for no-pass grade. There will be a few home assignments. They must be submitted in time, typed—not written up--and done professionally (written in good language, be concise and free of spelling errors - consider them as part of academic writing exercises).

It is gonna be fun - students tend to like the seminar and its atmosphere :)

Dear students,
The optimum number of students on this course is 16, the maximum is 20.

Please note that the final list of participants will be selected by prof. Severinov after registration closes.
Course Prerequisites
Molecular Biology theory and methods

2. Structure and Content

Course Academic Level
Master-level course suitable for PhD students

Number of ECTS credits
3

3. Assignments

<table>
<thead>
<tr>
<th>Assignment Type</th>
<th>Assignment Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>Papers send out to the class before the seminar to prepare for discussion.</td>
</tr>
<tr>
<td>Project</td>
<td>Paper presentation</td>
</tr>
<tr>
<td>Homework</td>
<td>A written analysis of the paper</td>
</tr>
</tbody>
</table>

4. Grading

<table>
<thead>
<tr>
<th>Type of Assessment</th>
<th>Pass/Fail</th>
</tr>
</thead>
</table>

Grade Structure

<table>
<thead>
<tr>
<th>Activity Type</th>
<th>Activity weight, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>25</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>25</td>
</tr>
<tr>
<td>Projects</td>
<td>50</td>
</tr>
</tbody>
</table>

Grading Scale

5. Basic Information

Attendance Requirements
Mandatory with Exceptions

Maximum Number of Students
Overall:  
Per Group (for seminars and labs): 14

Course Stream
Science, Technology and Engineering (STE)

Course Delivery Frequency
Every year

Students of Which Programs do You Recommend to Consider this Course as an Elective?

<table>
<thead>
<tr>
<th>Masters Programs</th>
<th>PhD Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Sciences</td>
<td></td>
</tr>
</tbody>
</table>

Course Tags
Biotechnology

6. Textbooks and Internet Resources

7. Facilities
### Equipment

| Projector, white board/writing wall |

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### 8. Learning Outcomes

<table>
<thead>
<tr>
<th>Knowledge</th>
</tr>
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<tbody>
<tr>
<td>Ability to read, comprehend, analyse, present, discuss and criticise primary scientific literature.</td>
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<table>
<thead>
<tr>
<th>Skill</th>
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</thead>
<tbody>
<tr>
<td>Ability to read, comprehend, analyse, present, discuss and criticise primary scientific literature, explain yourself and understand others.</td>
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</table>

<table>
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<tr>
<th>Experience</th>
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<tbody>
<tr>
<td>Public presentation, asking questions, reading significant amounts of science papers on short notice.</td>
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**Do you want to specify outcomes in another framework?**

Knowledge-Skill-Experience is good enough

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### 9. Assessment Criteria

**Select Assignment 1 Type**

- Homework

**Input Example(s) of Assignment 1 (preferable)**

- Prepare for discussion about: "Stochastic Gene Expression in a Single Cell"  
  Michael B. Elowitz, Arnold J. Levine, Eric D. Siggia, Peter S. Swain  
  SCIENCE 2002

**Or Upload Example(s) of Assignment 1**

- [https://ucarecdn.com/2c7283ac-075e-4975-86c1-5e401d875788/](https://ucarecdn.com/2c7283ac-075e-4975-86c1-5e401d875788/)

**Assessment Criteria for Assignment 1**

- Actively take part in discussions of the paper, answers question from the instructor or the student making the presentation, asks correct questions

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**Select Assignment 2 Type**

- Project

**Input Example(s) of Assignment 2 (preferable)**

- Prepare presentation about: "(p)ppGpp Controls Bacterial Persistence by Stochastic Induction of Toxin-Antitoxin Activity"  
  Etienne Maisonneuve, Manuela Castro-Camargo, and Kenn Gerdes  
  Cell 2013

**Or Upload Example(s) of Assignment 2**

- [https://ucarecdn.com/bbc6c0b5-4166-49bf-9e95-58a3b4e3ea18/](https://ucarecdn.com/bbc6c0b5-4166-49bf-9e95-58a3b4e3ea18/)

**Assessment Criteria for Assignment 2**

- The quality of presentation, analysis of research presented and critical discussion by students are evaluated. Students should be able to understand in details all the methods applied in the article they are presenting on a seminar.
Propose/describe an experiment that will allow you to create a phage that carries two rII point mutations (a double mutant). Be sure to include description of necessary controls and experiments that will confirm that the phage, once obtained, is indeed a double mutant. Assume that you have the wt phage, each of the single mutants, and a collection of deletion mutants (you may not need all of these to produce the requisite phage). You also have the B/K E. coli host strains and plates/flasks with solid and liquid media.