

Desislava (Dessy) Raytcheva, PhD

Lecturer in Biology

EDUCATION:

Postdoctoral scholar (Tufts University School of Medicine) *Jan 2014-Sep 2015*
Curriculum developer and facilitator at the Center for Translational Science Education at Tufts Medical.

- Edited the Infectious Diseases Curriculum.
- Designed six-day problem-based laboratory case with incorporated safe wet lab techniques for high school students.
- Co-designed an online course, Teaching Infectious Diseases, offered in partnership with Lesley University to graduate students at the college, as well as to in-service teachers in the entire country.
- Led in-person professional development (PD) workshops for high schoolteachers.

PhD in Biology *Boston, MA*
Northeastern University *2004-2012*

- Research focus: Marine virus assembly and interactions with its bacterial host
- Dissertation title: Structural Assembly and Growth of Marine Cyanophage Syn5
- Advisor: Prof. Jacqueline Piret; Co-advisor: Prof. Jonathan King (MIT)

MS degree in Industrial Biotechnology *Sofia, Bulgaria*
Bulgaria Sofia University *2002-2004*

- Thesis title: Examination of Potential Probiotic Activity of Wild Strains of *Lactobacillus bulgaricus* Isolated from Domestic Bulgarian Yogurt
- Advisor: Prof. Valentin Savov; Co-advisor: Dr. Valentina Chipeva (Bulgarian National Bank for Industrial Microorganisms and Cell Cultures)

BS degree in Biotechnology *1998-2002*
Sofia University

EMPLOYMENT HISTORY:

Lecturer (Northeastern University) *Sep 2015–current*
Teaching an inquiry-based laboratory course for Biology majors. The course is providing the students with the opportunity to design and execute their own research project.

Adjunct faculty (Northeastern University) *Jan–Dec, 2013*
Lectured the General Microbiology class for majors. Designed the course with emphasis on active learning by using problem sets, student's presentations, and fostering peer discussions.

Adjunct faculty (MCPHS) *Jan–Apr, 2013*
Laboratory instructor for *Medical Microbiology* and *General Biology*.

Educator (Boundless Learning Inc.,) *Oct–Dec, 2012*
Created content in Microbiology for a free online learning platform. The responsibilities included sourcing, synthesizing, and editing material.

Teaching assistant (Northeastern University):

2004-2012

Adapted the content when necessary, successful in maintaining student motivation and enthusiasm in the dynamic environment of laboratory classes; supervised and mentored students; designed and graded exams and quizzes, continuously provided feedback on student work.

- *General Microbiology* for Biology majors
- Taught the laboratory course for *Biochemistry, Principles of Biology* and *General Biology*

AWARDS:

- American Society for Microbiology, Conference Travel award (2014)
- American Society for Microbiology, Science Teaching Fellow (2013-2014)
- Dissertation Completion Fellowship by the Provost, Northeastern University (Spring 2012)
- Graduate Tuition Scholarship, Sofia University (2002-2004)
- Excellence Academic Scholarship, Sofia University (1999-2002)

RESEARCH EXPERIENCE:

PhD thesis: The thesis examined in depth the interactions of marine virus Syn5 with its photosynthetic bacterial host and opened a new chapter in the molecular biology studies of cyanophages.

- Developed a purification protocol for the isolation of highly concentrated and purified assembly intermediates of Syn5 from infected hostcells;
- Cloned and purified recombinant novel bacteriophage proteins and determined their function; designed and implemented a protocol for the detection of the surface position of specific Syn5 proteins

PhD thesis collaborations:

The phage team of Prof. Jonathan King (MIT)

- Combining the microbiological expertise of the Piret lab with the biochemical expertise of the King lab led to significant progress expanding the knowledge about the interactions on a molecular level of the marine virus Syn5 and its host. Cryo-electron microscopy group of Prof. Wah Chiu (Baylor College of Medicine, Houston)
- Provided samples and expertise in setting-up the virus-host model system at the microscopy laboratory at Baylor. Participated in designing the experiments to study the system via cryo-electron microscopy.

INTERNATIONAL CONFERENCE PRESENTATIONS:

- *Growth and Assembly of Marine Cyanophage Syn5 (poster)*, First International Congress on Viruses of Microbes, Paris, France 2010
- *Procapsids of Marine Cyanophage Syn5 (oral presentation)*, 21st Biennial Conference on Phage/Virus Assembly, Les Pensieres, Veyrier-du-Lac, France 2009

PROFESSIONAL MEMBERSHIPS:

- Member of the American Society for Microbiology

PUBLICATIONS:

Gipson P, Baker ML, **Raytcheva D**, Haase-Pettingell C, Piret J, King JA, Chiu W. 2014. *Protruding Knob-like Proteins Violate Local Symmetries in an Icosahedral Marine Virus*. Nat Commun. doi: 10.1038/ncomms5278.

Raytcheva DA, Haase-Pettingell C, Piret JM & King JA. 2014. *Two Novel Proteins of Cyanophage Syn5 Compose Its Unusual Horn Structure* J Virol. 88(4): 2047-55.

Dai W, Fu C, **Raytcheva D**, Flanagan J, Khant HA, Liu X, Rochat RH, Haase-Pettingell C, Piret J, Ludtke SJ, Nagayama K, Schmid MF, King JA, Chiu W. 2013. *Visualizing Virus Assembly Intermediates inside Marine Cyanobacteria*. Nature doi: 10.1038/nature12604.

Zhu B, Tabor S, **Raytcheva DA**, Hernandez A, King JA, Richardson CC. 2013. *The RNA Polymerase of Marine Cyanophage Syn5*. J Biol Chem. 288(5): 3545-52

Raytcheva DA, Haase-Pettingell C, Piret JM & King JA. 2011. *Intracellular Assembly of Cyanophage Syn5 Proceeds through a Scaffold-Containing Procapsid*. J Virol. 85: 2406-15.