

Biorisk assessment of genetic engineering — lessons learned from teaching interdisciplinary courses on responsible conduct in the life sciences

Mirko Himmel¹, Anastasia A. Malygina², Marina S. Dukhinova³

¹ Independent Lecturer in Bioethics and Biosecurity, Hamburg, Germany;

² Saint Petersburg State University, Saint Petersburg, Russia;

³ SCAMT Research Institute, ITMO University, Saint Petersburg, Russia

Genetic engineering is one of the ground-breaking technologies developed in the 20th century with great prospects for improving human, animal, and plant health, providing food security as well as environmental protection in times of climate change. From the early beginning on, scientists were debating about benefits and risks of genetic engineering and actively proposed measures for safe use of this technology. This led to the concept of “biosafety” which aims at protecting humans and the environment from unwanted consequences of the use of genetic engineering. Genetic engineering could be misapplied for even enhancing the threat potential of pathogens or toxins. The concept of “biosecurity” has been introduced to protect biomedicine and the life sciences of being misused for criminal or hostile purposes by malicious actors. The new WHO “Guidance framework for the responsible use of the life sciences” is the most recent example for improving awareness among partitioners in science to strengthening biorisk assessment strategies [1]. But still, there is the need for implementing any of such proposed biorisk assessment frameworks on national and institutional levels. Ideally, comprehensive training of students in the life sciences in biosafety and biosecurity should be mandatory worldwide and embedded in the curricula of their bachelor and master study programmes [2]. But how to engage students and improve their understanding for cross-disciplinary approaches in strengthening biosafety and biosecurity? Which teaching techniques are appropriate? Is there an opportunity for innovation? [3] The work presented here addresses these questions and provides insights in joint teaching activities of the last two years.

REFERENCES

1. apps.who.int [Internet]. Global guidance framework for the responsible use of the life science. Available at: <https://apps.who.int/iris/handle/10665/362313>
2. www.un.org [Internet]. The 6th BWC Review Conference. Sixth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction. Final Document. 2006. BWC/CONF.VI/6. Paragraph 14. Available at: <https://www.un.org/disarmament/publications/library/bwc>
3. Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their

Destruction. (2012). Considerations and recommendations to inculcate awareness of the dual-use challenge into biosafety and biosecurity training and education for life scientists in States Parties. BWC/MSP/2012/WP.4

AUTHORS' INFO

Mirko Himmel, Independent Lecturer in Bioethics and Biosecurity, Hamburg, Germany.
E-mail: mirko.himmel@yahoo.de

Anastasia A. Malygina, Associate professor, Strategic and Arms Control Studies Master's Program. Saint Petersburg State University, Saint Petersburg, Russia. E-mail: a.malygina@spbu.ru

Marina S. Dukhinova, Laboratory of Experimental Oncology and Immunology, SCAMT. Research Institute, ITMO University, Saint Petersburg, Russia. E-mail: dukhinova@scamt-itmo.ru