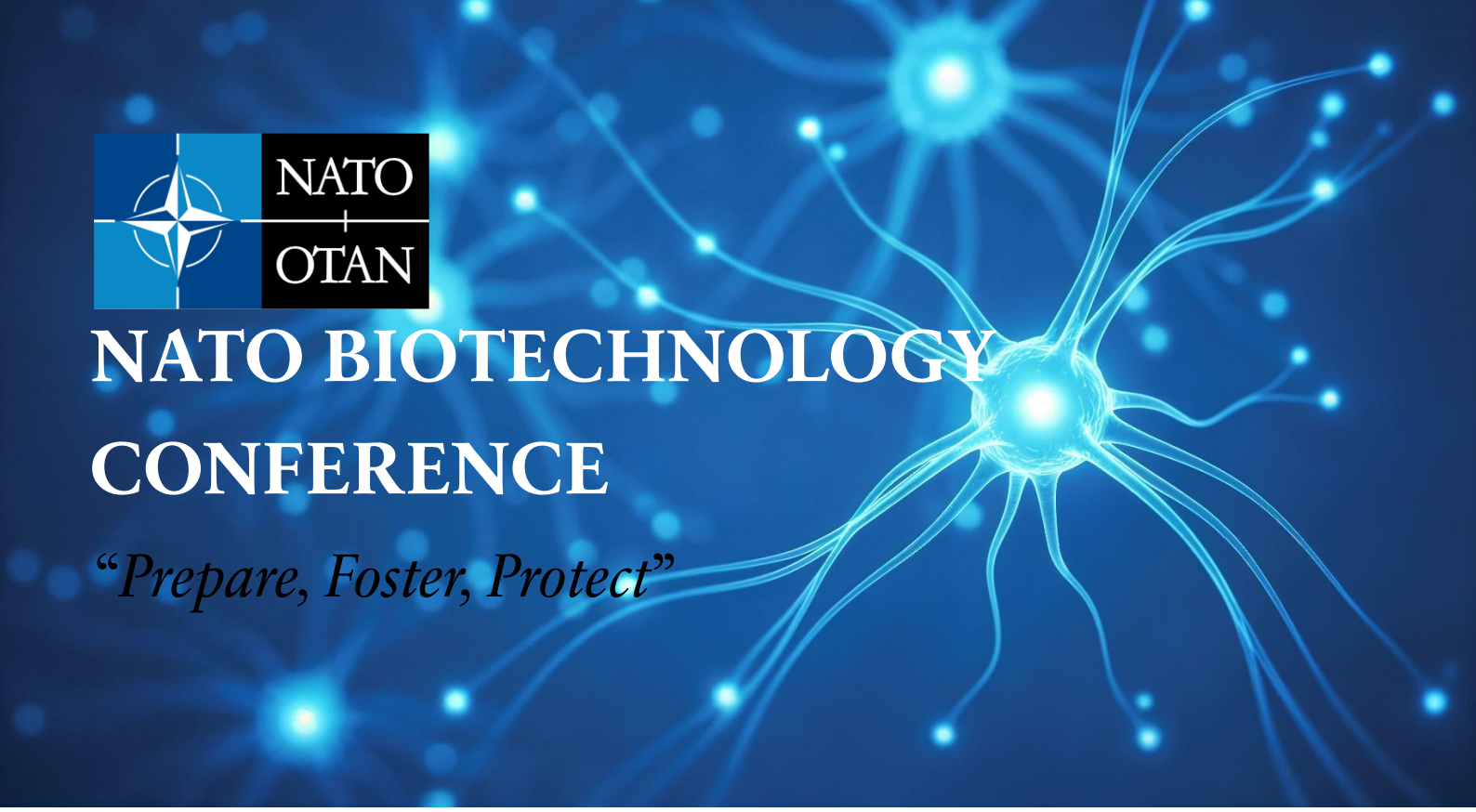

NATO BIOTECHNOLOGY CONFERENCE

"Prepare, Foster, Protect"

Community Building Session's Theme 1:

Synthetic Biology – Opportunities and Risks for the Alliance

Framing the context:

As reflected in the S&T Trends Report 2023-2043, the next revolutionary technology period will be driven by synthetic biology. Synthetic biology, a closely related subset of biotechnology, is the exploitation of biological processes for specific purposes, especially genetic manipulation and the re-engineering of organisms. In the NATO context, biotechnology includes both bio-engineered novel materials and human enhancement technologies. In addition to continuing developments in related technology areas (e.g., biodata, biosensors), this emerging trend will bring issues such as safeguarding sensitive research or 'research security' and regulation to the forefront of policymaking. Emerging areas of research such as the relationship between climate change and chemical, biological, radiological, and nuclear (CBRN) threats also necessitate increased awareness in relation to future biotechnology development.

"A multidisciplinary area of biotechnology that seeks to harness living systems, or compounds derived from them, in research and product development.

"It combines science, technology and engineering to facilitate and accelerate the understanding, design, redesign, manufacture and/or modification of genetic materials, living organisms and other biological systems.

"With a focus on recoding genetic sequences, the promise of synthetic biology is to engineer living systems in a controlled and increasingly predictable way."

Key judgements:

- Synthetic biology and related technologies will have a disruptive, revolutionary impact within the next 20 years, in both the civilian and military realms.

- While the potential benefits from increased biotechnology use are substantial, especially for healthcare, the risks of harmful uses are also enormous. This necessitates careful consideration of security and defence implications, including the protection and sharing of research.

- Research safeguards need to align with our shared values and norms.

Guiding questions:

- What problems are defence organisations trying to solve?

- Defending NATO's air, land and sea, and its interests in space.

- Controlling the enemy's air, land and sea, and its equipment in space.

- Supplying NATO war fighters with effective equipment, logistics, nutrition, and medical care.

- In what areas might synthetic biology offer opportunities?

- In what areas might synthetic biology create risks?

- How might synthetic biology offset the challenge posed by adversaries which have advantages of mass and scale?

- How do we seize the opportunities, and how do we prevent the risks from materialising?

- What makes synthetic biology a more compelling investment proposition to defence budget holders than other cutting-edge technologies?

- What should we do next?