



Australian Government

Department of Defence
Science and Technology

EDTAS

EMERGING DISRUPTIVE TECHNOLOGY
ASSESSMENT SYMPOSIUM

HUMAN BIOTECHNOLOGIES

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 #EDTAS

Defence Science and Technology (DST) will be hosting an Emerging and Disruptive Technology Assessment Symposium (EDTAS) on Human Biotechnologies. The EDTAS series helps future-proof Australian Defence, utilising the Next Generation Technologies Fund to consider an expansive science and technology topic that will likely have a major impact for the Defence or National Security domains in the 20+ year timeframe.

The objective of this symposium is to explore emerging and disruptive trends in Human Biotechnologies (HB), with the aim of understanding and shaping the long term vision for Defence and National Security interests.

- This event will consider HB in the 2040 timeframe, examining their application for Human Measurement and Modification. A key outcome from the symposium will be a big picture assessment report developed through the workshop contributions of all attendees.
- This symposium will provide a number of opportunities for participants including networking and partnering, an understanding of strategic and S&T challenges and an input to shape long term Defence and National Security guidance.

HUMAN BIOTECHNOLOGIES

Biotechnology is a rapidly expanding field of research and development that has the potential to transform many aspects of the world around us. To ensure a manageable scope, EDTAS HB will focus on the exploration of threats and opportunities presented by the emergence of these biotechnologies as they apply to the human in the Defence context. The symposium will seek to identify and understand how biotechnology in the 2040 timeframe might allow a better understanding of human attributes and its potential for modifying those attributes. The Symposium will also examine the ethical implications of these fields of research.

HUMAN MEASUREMENT TECHNOLOGIES IN 2040

These are biotechnologies that are expected to provide rapid, low cost, high fidelity insights into the characteristics of an individual through which an understanding of their capacity for performance and resilience might be assessed.

Bioinformatics: The application of mathematical and computer science techniques to create methods and tools to better understand biological data.

Biochemistry: The application of emerging analysis techniques to characterise the molecules related to cell function, e.g. proteomics and metabolomics.

Genomics: The application of techniques such as gene sequencing and genetic engineering (under the umbrella of synthetic biology) to determine the characteristics of an individual including their predisposition to a range of performance and injury types.

Nano-robotics: Nanoscale robotic units applied to the measurement of human characteristics.

Bio-sensing: Worn, swallowed or implanted sensors used to measure the status and/or performance of an individual.

HUMAN MODIFICATION TECHNOLOGIES IN 2040

These are biotechnologies that are expected to provide methods that have the potential to enhance or degrade the capacity for performance and resilience of an individual.

Metabolic Engineering: Tools and techniques to alter or optimise cellular biochemistry.

Genetic Engineering: Tools and techniques to alter the genetic makeup of cells to achieve a physiological effect.

Delivery Systems: Technologies used for delivering a physiological effect ranging from vaccines and microencapsulation of nutrients through to embedded robotics e.g. an insulin pump.

Physiological Enhancement: Technologies that act on human physiological structures and processes to extend an individual's performance and/or resilience, physically and/or cognitively, e.g. performance enhancing drugs.

Physiological Augmentation: The application of technologies that act on human physiological structures and processes to supplement the natural range of human physical or cognitive abilities, e.g. neural implants for multispectral sensing.

DRIVERS, BARRIERS AND IMPLICATIONS

The EDTAS symposium will explore the broader implications of Human Biotechnology from a societal perspective, as well as the potential barriers to adoption for Defence. What economic, social, political, Defence and National Security implications will HB technology have in the next 20 years and beyond? And what are the legal, ethical and policy issues that may hamper Defence's adoption of HB technology?

EVENT INFORMATION

Date: 3–4 May 2018

Venue: Sanctuary Building, Adelaide Zoo, Frome Road, Adelaide

Attendance: Attendance at the symposium is by invitation only. If you have expertise in the area of human biotechnologies and would like to receive an invitation, please contact the EDTAS organisers as numbers are limited.

CONTACT AND FURTHER INFORMATION

For more information please email us at edtas@dst.defence.gov.au