Bioethics Advisory Committee
Singapore

Science Centre Singapore and Bioethics Advisory Committee Addresses Scientific Curiosity and Conscience with *'Bioethics: We Could, But Should We?'*

The latest bioethics exhibition prompts guests to explore the fine balance between scientific possibility and ethical justifiability

SINGAPORE, 29TH August 2024 - Science Centre Singapore (SCS) and the Bioethics Advisory Committee (BAC) today unveiled *Bioethics: We Could, But Should We?*, an interactive exhibition that seeks to elevate public understanding about bioethics amid an era of scientific innovation and science, technology, engineering and mathematics (STEM)-powered breakthroughs. Developed in collaboration with the BAC and supported by the Ministry of Health (MOH), the new exhibition brings to life complex ethical scenarios posed by today's Artificial Intelligence (AI) and MedTech evolutions.

In a rapidly advancing era of biomedical research where possibilities seem boundless and STEM innovations have unlocked novel prospects, the exhibition prompts visitors to contemplate the critical ethical implications of these breakthroughs and how human lives may be altered when ethical considerations take a backseat.

The latest exhibition will feature four immersive dioramas around the themes of AI in healthcare, gene editing, biological self-experimentation and brain organoid research. Each diorama will present a compelling narrative on the ethical dilemmas posed by the respective cutting-edge advancements and bring to life examples of complex ethical scenarios on AI controlled robotic surgeries, gene editing in human embryos, biological self-experimentation for enhancement, and use of brain organoids in biomedical research.

Though the dioramas portray possible futures, they largely consist of technologies already available today or are well within reach. The possible futures depend more on whether regulations permit or forbid the development and application of new technologies.

Associate Professor Lim Tit Meng, Chief Executive of Science Centre Board said, "In our quest for biomedical progress, it is key to remember that innovations extend beyond science alone; but they hold the power to impact lives today – as well as shape the future for generations to come. *Bioethics: We Could, But Should We?* aligns with our mission to not just showcase the wonders of science, but to evoke contemplation and raise ethical awareness. We hope that the exhibition will act as a catalyst for informed dialogue on the ethical dimensions of scientific progress and invite us to think 'what we should do' in the pursuit of biomedical knowledge."

Emeritus Professor Lee Eng Hin, Chair of the Bioethics Advisory Committee said, "We are proud to collaborate with SCS on an exhibition that actively engages the public in ethical discourse on biomedical research. Our aim is to enhance public education and raise awareness of bioethics among members of the public in Singapore. The exhibition is an invitation to contribute to the

dialogue, and foster an understanding of the ethical principles that guides our journey into uncharted territories of biomedical exploration."

The exhibition will officially open to the public from 29 August 2024, and admission is complimentary with every Science Centre Singapore ticket.

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About Science Centre Singapore
Science Centre Singapore, a non-formal educational institution and leading regional Science Centre, along with its group of attractions, brings out the wonders of science, technology, engineering and mathematics through its unique blend of exhibitions, educational programmes and events. A custodian of creativity and innovation, Science Centre Singapore has captured the evolution of scientific developments for nearly four decades.

The Centre and its partners have played a pivotal role in transforming the way students and the public interact with and learn about science, technology, engineering and mathematics. Since 1977, the Centre has welcomed over 30 million visitors and inspired them with more than 1,000 exhibits spread across 14 exhibition galleries and outdoor exhibition spaces.

The Centre's group of attractions include Omni-Theatre, Snow City and KidsSTOP™. The Omni-Theatre is an immersive dual-technology edutainment destination fitted with Southeast Asia's largest seamless dome screen and featuring the latest and brightest 8k digital fulldome system in

the world. Snow City is Singapore's only permanent indoor snow centre offering an Arctic inspired experience at Singapore's first ice gallery and snow chamber. KidsSTOP™ - Where every child gets to Imagine, Experience, Discover and Dream - is Singapore's first children's science centre offering an enriching experience through purposeful play for children aged 18 months to 8 years old. For more information, please visit www.science.edu.sg.

About Bioethics Advisory Committee (BAC)

The Bioethics Advisory Committee (BAC) is an independent national advisory committee established by Cabinet in 2000 to examine and develop policy recommendations on the ethical, legal, and social issues arising from human biomedical science and research. The BAC develops and recommend policies with the aim of protecting the rights and welfare of individuals, while allowing the biomedical sciences to develop and realise their full potential for the benefit of humankind. Through its recommendations, the BAC ensures that the best ethical practice in biomedical research is ascertained and encouraged. The BAC's work has contributed to the establishment of a research ethics governance framework in Singapore that is in accordance with ethical standards recognised internationally while taking into consideration locally relevant concerns or issues. To date, the BAC has published eight advisory reports and three guidelines, and its members also actively participate in the UNESCO Bioethics Programme and contribute to the International Bioethics Committee and Intergovernmental Bioethics Committee ethical deliberations. The BAC is supported by the Biomedical Ethics Coordinating Office under the Ministry of Health.

APPENDIX

Bioethics: We Could, But Should We? will feature four immersive dioramas depicting scenes addressing the following scientific innovations and ethical risks involved:

1. **AI-Controlled Robotic Surgery**

   With the use of AI to control robotic surgical arms autonomously without human control, surgeries can today be performed faster and more accurately. But how do we ensure that AI will not make mistakes that harm the patient? Explore the use of AI to control robotic surgical arms autonomously. While this promises faster and more accurate surgeries, questions arise about ensuring patient safety and preventing AI errors.

2. **Gene Editing in Human Embryos**

   Gene editing has unlocked the promising possibility of preventing newborns from inheriting serious genetic diseases, giving couples who are unable to produce genetically normal progeny an opportunity to have healthy offspring. However, how do we know that changes made to a child's genes will not have any unforeseen harmful side effects to the future offspring? The diorama prompts reflection on the potential unforeseen consequences and long-term impacts on future generations.

3. **Biological self-experimentations for enhancement**

Though we have autonomy to experiment on ourselves, for example injecting ourselves with stem cells or genetic material to enhance our physiology, should we do so, given that the benefits have not yet been proven and may not outweigh the risks?

4. Brain Organoid Research

Cures for many neurological diseases require studying the living human brain, which is not feasible and may pose risks to research participants. Brain organoids can be used for research instead, but what if such brain organoids develop consciousness?

The exhibition will also showcase:

- A poster wall featuring films with bioethical themes:
    1. M3GAN is a film that portrays a possibility of applying AI without first ensuring that the AI is imbued with human values.
    2. Limitless is a film that portrays the protagonist who took mind-enhancing pills to improve his mental abilities but was unaware of its lethal side-effects.
    3. Ship of Theseus raises questions on balancing the moral values we have against surviving disease.
    4. Plan 75 is a film that will increasingly become relevant to Singapore; we are a country with a rapidly ageing population that may, if not addressed well, threaten the long-term well-being of the country.
    5. Frankenstein is a film based on the book with the same name written by Mary Shelley. The story is about the creation of artificial life and provokes thought on what makes humans “special”.

- Entrance statement – a collection of bioethical questions to set the mood for the exhibition.

- A see-saw as a physical analogy of what bioethics is: balancing the benefits of biomedical technologies against the risks.

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