

# *Brainstorming Cyberbiosecurity*

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# Biosafety and Biosecurity

<https://www.lsu.edu/ehs/research-safety/biosafety.php>

- Biosafety is the discipline that addresses the safe handling and containment of infectious microorganisms and hazardous biological materials.
  - The goal of biosafety is to reduce or eliminate exposure of lab personnel, the community and the environment to potentially infectious or hazardous agents...through containment and risk assessment.
- Biosecurity is defined as the strategic approach to analyzing and managing risks to human health, animal and plant life and the associated risks to the environment.
  - It is based on recognition that hazards have the potential to be deliberately or accidentally misused resulting in harm...both in a laboratory and beyond
  - Control the possession, development and use of dangerous pathogens and biotoxins

# “The World Has Changed”

- Though important, the Biological Weapons and Toxins Convention (BWTC) and the Treaty does not address all current and emerging threats
  - It still does not address the forensics and attribution of biological threats for which capabilities exist in many countries since the late 1990s-2000
- Biosafety and Biosecurity are Addressed Through Professional Organizations, i.e., the International Federation of Biosafety Associations or Biosecurity As:
  - Specific National Policies and Guidance, i.e., Scotland’s “Biosecurity practices for animal health: guidance”
  - Brazilian Virtual Biosecurity Center, Ministry of Science and Technology
- **Adapting to, as well as preparing for and anticipating new threats likely not happen in our lifetimes through formal international conventions, though could happen at the national level...**
- **Thus, individuals and professional organizations will have to push forward and demonstrate the need and value for investment in new approaches to securing laboratories and lab networks**
  - **Government support or direction may follow, perhaps through your Ministry of Science and Technology??**

# The Bioeconomy is Massive in the U.S.

- The U.S. bioeconomy relies on a complex and evolving ecosystem that extends from research and development through manufacturing, and it also encompasses related services.
- The U.S. bioeconomy draws on multiple resources and encompasses multiple applications.
- Value=Ca. US\$ 1 Trillion, 5% of the Gross Domestic Product (Low End), \$4.5T (High End)



# “Safeguarding the Bioeconomy”: Context for Cyberbiosecurity



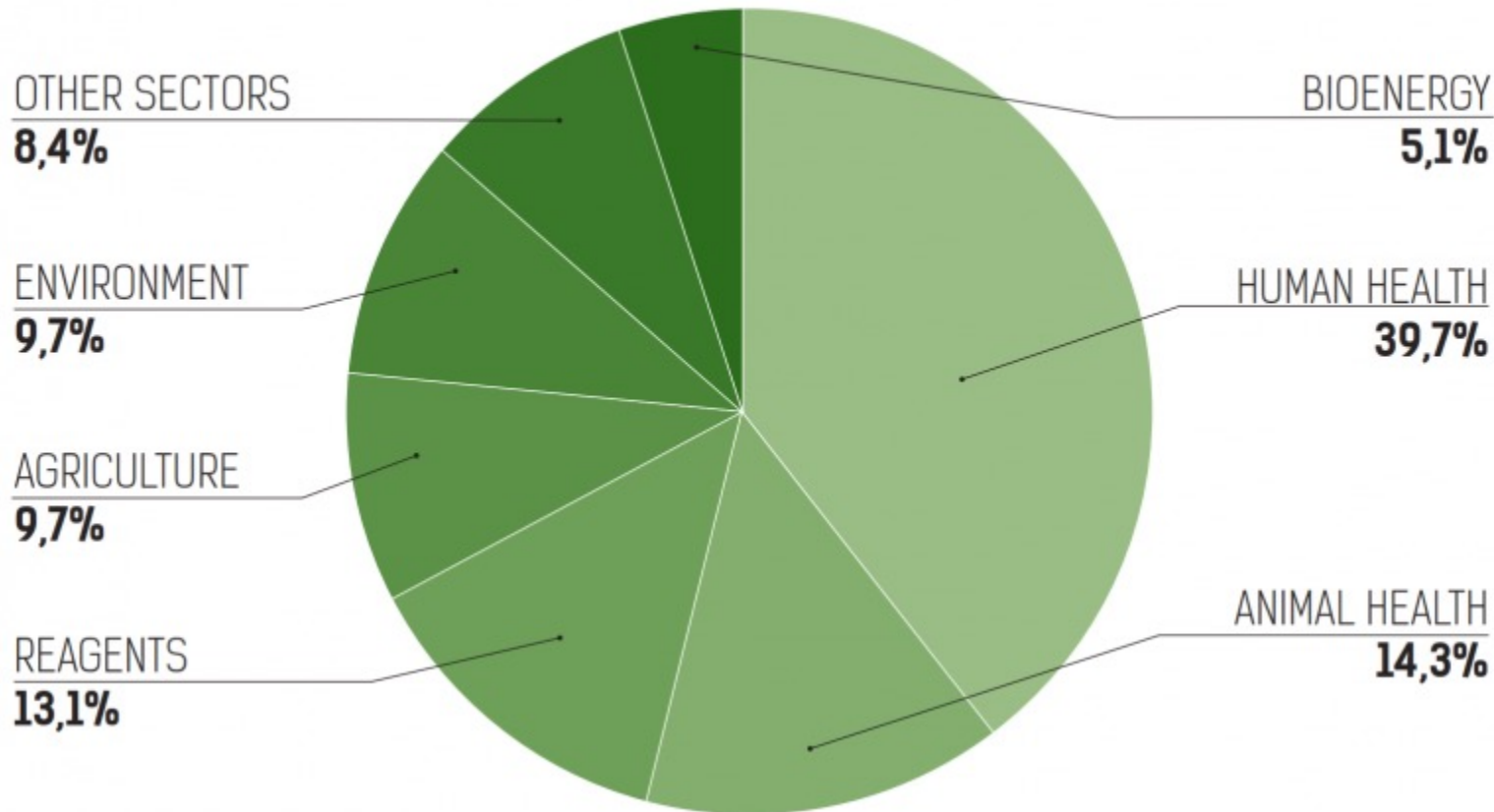
- National Academies of Sciences, Engineering, and Medicine. 2020. Safeguarding the Bioeconomy. Washington, DC: The National Academies Press.  
<https://doi.org/10.17226/25525>
- Sponsor: Office of the Director of National Intelligence, USA
- Champion: **Supervisory Special Agent Edward You, Weapons of Mass Destruction Directorate, FBI Headquarters, Washington, DC**
  - **Views Cyberbiosecurity as one of the “Action Arms” of Safeguarding the Bioeconomy**
- NASEM Report: Cybersecurity and Cyberbiosecurity are Mentioned and Discussed in a Number of Places



<https://biolatinamerica.com/>

The 237 Brazilian companies mapped are divided into the following areas:

**GRAPH 1 - DISTRIBUTION BY AREA**



A study done by CEBRAP (The Brazilian Center of Analysis and Planning) mapped 237 biotechnology companies in Brazil, and according to SINDUSFARMA (The Syndicate of the Pharmaceutical Products Industry in the State of São Paulo) in 2017 the Brazilian biopharmaceutical and biotechnology market was worth about US\$ 18 billion.

Universities in Brazil Have Considerable Investments through Related Programs—Biology, Biochemistry, Pharmacology, Agriculture, Computer Science

*Universidade de São Paulo*

**UNESP - Universidade Estadual Paulista**

*Federal University of Rio de Janeiro*

*Federal University of Rio Grande do Sul*

State University of Campinas

Federal University of São Paulo

Federal University of Minas Gerais

# What Should We Do When New Threats and Opportunities Occur? My Agenda...What is Yours?

- Leadership
- Understand and Communicate the Problem Set
- Look Forward
- Engage and Organize Experts
- Obtain Require Resources
- Build a Community of Interest
- Educate Upwards
- Engage Interested Sectors
- Build Partnerships