CONFERENCE ON NONPROLIFERATION AND DUAL-USE AWARENESS

PROBLEM OF DUAL-USE BIOLOGICAL RESEARCH

Uyangaa Temuujin /PhD/

Mongolian University of Life Sciences

MONGOLIA

National statistics office, 2015

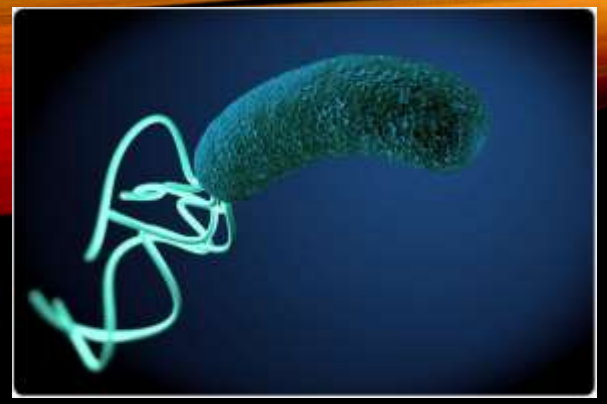
Territory:
1,566,000 km2
19th rank by area

Population:
3 million

Capital city:
Ulaanbaatar

52 million food producing livestock animals

WORK AREA



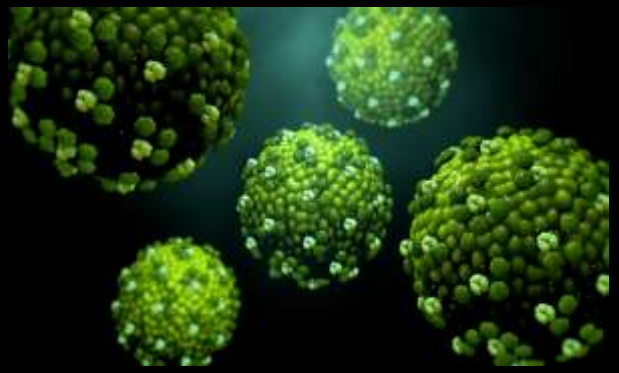
Pathogenic bacteria

Bacillus subtilis
Escherichia coli
[Streptomyces coelicolor]

Zoonotic bacteria

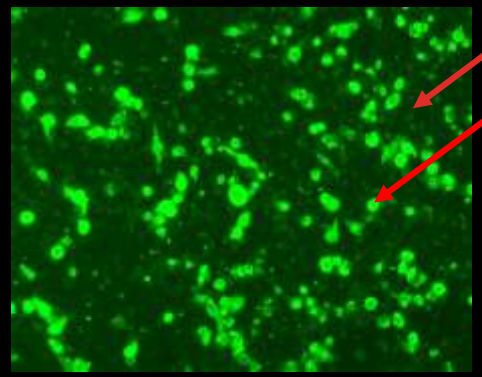
Burkholderia mallei
Burkholderia pseudomallei

Glanders Disease



Virus

Canine parvovirus
Influenza virus



POTENTIAL RISK

Known risk

Isolation, identification, characterization of microorganism

Risk of deliberate creation

Biological weapon, bioterrorism

Risk of accident

Biological agent

DUAL USE

Peaceful use

Weapons use

PUBLIC HEALTH

Diagnosis
Drugs
Vaccine

BIODEFENCE

Defends against
military
use of bioweapons

OFFENSIVE MILITARY

Bioweapons
Terrorists

SYNTHETIC BIOLOGY AND DUAL USE

What is the dual use risk of synthetic biology?

- **“lone operator,” such as a highly trained molecular biologist**
- **biohackers, e.g. college kids who are eager to demonstrate their technological abilities**
- **The growth of the number of *do-it-yourself-biologists* has increased**

Tucker, J. B., & Zilinskas R. A. (2006).The promise and perils of synthetic biology. The New Atlantis, March 2006.

National Center for Biotechnology Information
NCBI

ETHICAL ISSUE

- ✓Main principles and guidelines for biological research
- ✓Discussion on plagiarism in academic research
- ✓Researchers from developed countries try to sample low-income vulnerable populations for biomedical research, to try new methods of treatment and prevention
- ✓Some Ph.D. candidates and other researchers studying in foreign countries have been studied to use the blood and serum of human and animal to medical research in foreign laboratories, losing the "sensitive" secret of the "Mongolian Gene Foundation", which can lead to national security.

DUAL USE EDUCATION CASE STUDIES

- ***Computer based modules*** to extend lessons beyond the classroom.
- ***Multimedia presentations*** that will teach graduate students and advanced undergraduates awareness of dual use research.
- ***Use real case scenarios*** to illustrate the ethical dilemmas and the potential misuse of research.
- ***Spark discussion*** of the responsibility of scientists to limit risks.

CONCLUSION

- Recognize that there is a potential problem and that the public is seriously concerned about it
- Be informed about the scientific community's efforts to minimize misuse responsibly
- Remain sensitive to the potential in your own research and in reviewing the work of others
- If a concern arises, know who to consult


Thank You
For Your Atten