



PREMIER MINISTRE

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**Dual use research of concern in life
sciences**

**French National Consultative Council for
Biosecurity**

**OMSA
March 23, 2026**

Secrétariat général de la défense et de la sécurité nationale
Direction des affaires internationales, stratégiques et technologiques

1. DURC in life sciences

Definition of DURC in life sciences

Dual use research of concern (DURC) is a research that, on the basis of "state of the art and knowledge", could reasonably lead to knowledge, products or technologies that could be **directly diverted and/or pose a threat** to public health; agriculture, wildlife, flora, the environment and/or national security. *(definition derived from the 2007 NSABB report)*

➔ As such, DURC could be considered as an **intangible knowledge** that should be **controlled as a dual use good**.

Many countries have developed awareness raising towards scientists or regulations to limit risk associated with DURC.

Gain-of-Function (GoF) describes the **gain of new functions by organisms through genetic changes**, which can **naturally** occur or by **experimental genetic modifications**.

Gain-of-Function research is generally made on viruses and results in enhancing transmissibility, virus replication, virulence, host range, immune evasion or drug and vaccine resistance to get insights into the viral mechanisms, to create and analyze animal models, to accelerate drug and vaccine development and to improve pandemic preparedness. *(Saalbach KP. Gain-of-function research. Adv Appl Microbiol. 2022;120:79-111)*

Some examples of DURC on viruses

RESEARCH ARTICLE

Construction of an infectious horsepox virus vaccine from chemically synthesized DNA fragments

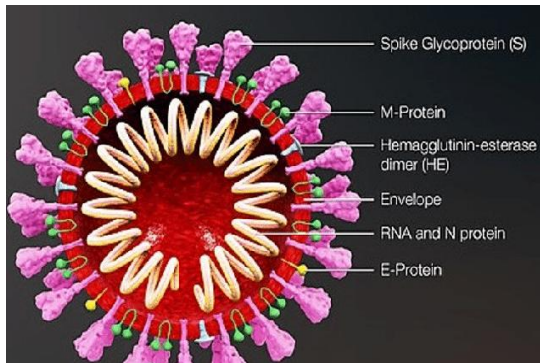
Chemical Synthesis of Poliovirus cDNA: Generation of Infectious Virus in the Absence of Natural Template

Characterization of the Reconstructed 1918 Spanish Influenza Pandemic Virus

Expression of Mouse Interleukin-4 by a Recombinant Ectromelia Virus Suppresses Cytolytic Lymphocyte Responses and Overcomes Genetic Resistance to Mousepox

Some examples of DURC on SARS-Cov-2

Escape from neutralizing antibodies by SARS-CoV-2 spike protein variants



Mutthuraj, D et al. (2020). CoVID-19: An Overview of the Characteristics, Diagnosis and Prevention of the Deadly Pandemic Disease. *Acta pharmaceutica Suecica*. 1. 14-20.

Article

Rapid reconstruction of SARS-CoV-2 using a synthetic genomics platform

> [bioRxiv](https://doi.org/10.1101/2022.10.13.512134). 2023 Jan 10:2022.10.13.512134. doi: 10.1101/2022.10.13.512134. Preprint

Role of spike in the pathogenic and antigenic behavior of SARS-CoV-2 BA.1 Omicron

Some recent example of GoF and DURC



bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

New Results

 [Follow this preprint](#)

Lethal Infection of Human ACE2-Transgenic Mice Caused by SARS-CoV-2-related Pangolin Coronavirus GX_P2V(short_3UTR)

Posted January 04, 2024.

Abstract

SARS-CoV-2-related pangolin coronavirus GX_P2V(short_3UTR) can cause 100% mortality in human ACE2-transgenic mice, potentially attributable to late-stage brain infection. This underscores a spillover risk of GX_P2V into humans and provides a unique model for understanding the pathogenic mechanisms of SARS-CoV-2-related viruses.

2. French National Consultative Council for Biosecurity



Safety and security issues in biological research



- **Joint Committee** of the General Secretariat for Defense and National Security (SGDSN) and the **French National Academy of Science**
- **Public think tank** at the service of **scientists and administrations**
- Created in **2015** (Decree n°2015-1095).



French National Consultative Council for Biosecurity: CNCB



6 members from the French administration



ACADÉMIE
DES SCIENCES
INSTITUT DE FRANCE

6 renowned scientists
designated by the Academy of Science



- Reflect on the **possible misuse of life sciences** and how to avoid it.
- Carry out **foresight and monitoring work on dual-use research** in the life sciences.
- Propose measures to **prevent, detect and deal with potential threats**.
- Formulate recommendations to ensure that **advances in the biological sciences do not generate new threats**.
- Help **inform the public** and make the **scientific and healthcare communities more accountable**.
- Ensure that **international commitments** are **respected and improved**.

DURC in the CNCB's work

Dual use research of concern:
guidelines to take them into
account in biological research

2016

CRISPR/Cas 9 : do molecular
scissors pose a risk to biological
safety ?

2019



2022

Advice on the possible
risks associated with
dual research in a
research project

DURC : guidelines to take them into account in biological research

1. **Raising awareness** of “dual-risk research” among managers of public and private research establishments and organizations
2. Training future scientists during their studies : “science and society”, “scientific ethics”
3. Creation of **special committees in research establishments: support** management and research teams in **identifying the risks** of certain projects
4. **Dual-risk evaluation** of certain research projects: role of ANR and CEUCO
5. **Funded DURC** : support from an **independent DURC monitoring committee**



DURC : guidelines to take them into account in biological research

6. **Mandatory confidential reporting** of DURC : feedback process
7. Role of the CNCB as an **appeal body**, particularly for **publications** concerning DURC
8. **DURC correspondent in research establishments**, role of the defense security officer: local information on DURC and its misuse
9. **Proactive action** within international bodies for **effective control of gene sequence transfers and associated synthetic oligonucleotides**



3. New control of DU GoF research of concern in France

DU GoF research of concern supervising Committee

Our approach was to :

- raise awareness among researchers,
- avoid the creation of new regulations,
- create a mechanism managed by research organizations and based on support for the research project from its construction to the results' publication.



1/ DU GoF assessment questionnaire:

- questions designed to help research teams identify the dual nature of their work,
- focus on the production of gain-of-function (GoF) mutants of viruses or pathogenic microorganisms.



2/ Committee to supervise dual use gain of function research:

Members : researchers, ethicists and legal experts.

Tasks : - audit the research prior to funding and implementation
- offer assistance with benefit/risk assessment
- propose guidelines to mitigate the risks identified
- monitor identified and authorized research projects,
- provide support for all aspects of the project, including making data available, particularly for publication.

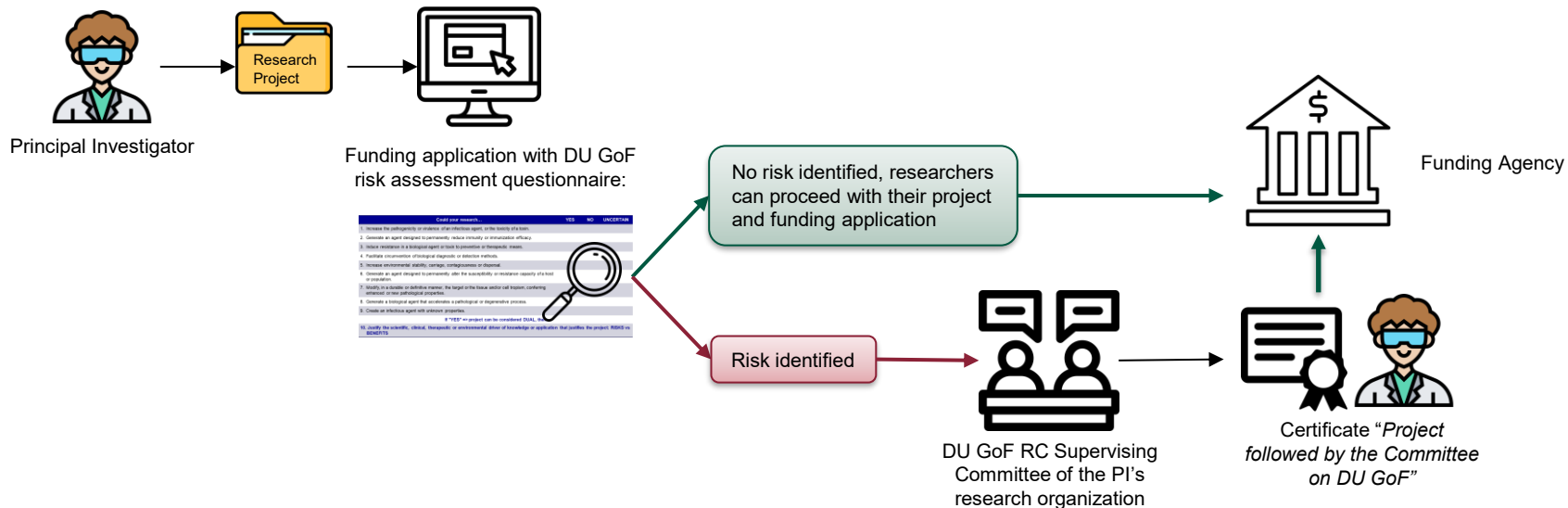
DU GoF assessment questionnaire

Could your research...	YES	NO	UNCERTAIN
1. Increase the pathogenicity or virulence of an infectious agent, or the toxicity of a toxin.			
2. Generate an agent designed to permanently reduce immunity or immunization efficacy.			
3. Induce resistance in a biological agent or toxin to preventive or therapeutic means.			
4. Facilitate circumvention of biological diagnostic or detection methods.			
5. Increase environmental stability, carriage, contagiousness or dispersal.			
6. Generate an agent designed to permanently alter the susceptibility or resistance capacity of a host or population.			
7. Modify, in a durable or definitive manner, the target or the tissue and/or cell tropism, conferring enhanced or new pathological properties.			
8. Generate a biological agent that accelerates a pathological or degenerative process.			
9. Create an infectious agent with unknown properties.			

If one answer is "YES" => project can be considered DUAL, then

10. Justify the scientific, clinical, therapeutic or environmental driver of knowledge or application that justifies the project: RISKS vs BENEFITS

Procedure on DU GoF research of concern



3. CNCB's seminar on dual use research of concern

CNCB's seminar on dual use research of concern 29/10/2024



French Academy of Science

Objectives of the seminar :

- ✓ **raise awareness** among the research community;
- ✓ create a **dynamic for communication and consultation** on DURC issues **within the scientific community** and **with the relevant government departments**.



Grande Salle des Séances

Presentations from special guests

Filippa LENTZOS: Senior Research Fellow at King's College London on threats to health security, biosafety and biohazard management

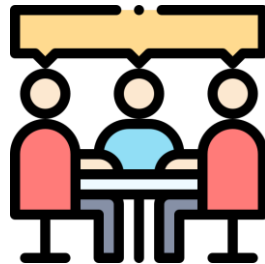
Didier BREYER: Director of the Biosafety and Biotechnology Department at Sciensano, a research center and National Institute of Public Health in Belgium



Importance of an **international cooperation**
in the field of **biosafety and biosecurity**,
and more specifically regarding **DURC**

Round-table 1: “DURC and gain of function experiments”

- Not all gain-of-function experiments are equivalent, many parameters need to be taken into account to **identify potential risks: case-by-case assessments.**



- DURC → question of **responsibility towards society** → call for greater transparency of the scientist + his research institution
- Research governance, decision-making and definition of acceptable risk
- ➔ **culture of responsibility within research institutions, share the burden** between the scientist and its research institution

Round-table 2: “DURC and new technologies”

Possible technological breakthrough in biology, based on :

1. **artificial intelligence**,
2. increase of reliable and numerous **data** (democratization of sequencing capacities + freely accessible databases),
3. combine the two previous advances with **synthetic biology** to create new agents.



Need for **transparency** in both software and database use :
“black box” databases for problematic sequences ?

“*data poisoning*” ⊖ would delay positive uses far more than malicious ones.



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Thank you for your attention !

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