Supplemental Dual Use Research of Concern (DURC) Registration Form
Yale Institutional Review Entity (IRE)

Research with any agent of the 15 pathogens and toxins identified by the United States Government as Dual Use Research of Concern (DURC) agents, must be reviewed by Yale University's Institutional Review Entity (IRE) as required by the U.S. Government DURC Policy, which is mandatory for any NIH funded institution.

In reviewing registrations, the Yale IBC considers "dual use" potential, namely the potential for research projects with a beneficial purpose to provide knowledge, products or technologies that could be directly misapplied to pose a threat to public health and safety, agricultural crops and other plants, animals, the environment, or material. For a full discussion of this topic, consult http://osp.od.nih.gov/office-biotechnology-activities/biosecurity/dual-use-research-concern

Your research has been identified to involve on of the 15 DURC agents and you must complete this Yale IRE application and received authorization from the Yale IRE prior to initiating your research. The Yale IRE will notify all related University Committees, such as the Yale Biological Safety Committee, the Yale Institutional Animal Care and Use Committee, and the Yale Human Investigation Committee, when the IRE review process is completed and the results of the review. **Please note that a small subset of DURC research protocols must also be approved by the U.S. Government as well as Yale University. In these cases, you will be notified of the required additional review and additional information may be needed from you.**

Please complete the questions on this registration form and send the completed form back to the attention of:

Biosafety Officer

Yale Environmental Health & Safety

135 College Street, Suite 100

New Haven, CT 06510

Phone: 203-785-3550

Fax: 203-785-7588

You can also email the form to Benjamin.fontes@yale.edu

DURC Application Form

Date: _____

Principal Investigator (PI)

Name (Last, First, MI): _____

Mailing address: _____

Phone number: _____

Fax: _____

Email: _____

Department (if applicable): _____

Person Preparing This Document (If Not the PI)

Name: _____

Phone number: _____

Email: _____

Fax: _____

Title of Research Project: _____

Will you be conducting research that directly uses non-attenuated forms of one or more of the following agents? ☐Yes ☐No.

If yes, please check the agent(s) involved:

☐Avian influenza virus (highly pathogenic)
☐Bacillus anthracis
☐Botulinum neurotoxin (in any quantity)
☐Burkholderia mallei
☐Burkholderia pseudomallei
☐Ebola virus
☐Foot-and-mouth disease virus
☐Francisella tularensis
☐Marburg virus
☐Reconstructed 1918 influenza virus
☐Rinderpest virus
☐Toxin-producing strains of Clostridium botulinum
☐Variola major virus
☐Variola minor virus
☐Yersinia pestis

Agent Name (trade name, etc.): _____

Form (liquid? Powder?): _____

Risk Group of your Agent: _____

Biocontainment Level required for your Agent:

_____

In the space provided below, please describe the rationale for the use of the agent identified in this experiment. Ensure that the response includes why the agent was selected, what it does and how it achieves the desired result.

Can an alternate agent be utilized to achieve the desired result? ☐ Yes ☐ No

If yes, please describe why the alternate agent will not be utilized.

Will the agent be modified in any manner, such as through the use of recombinant DNA techniques, inserting the agent into a delivery vehicle such as a viral vector, liposome or nanoparticle, or any other manipulation? ☐ Yes ☐ No

If Yes, please describe the modification

For the agent selected, please provide a description of the agent that includes the following:

Strain, type or sub-type:

Dose for study subject, animal or cells:

_____

Total number of study subjects, animals that will be used in the study:

_____

Quantity of the agent that will be in your lab's possession at any one time (ml or mg):

_____

(*If the agent is purchased in Units, please convert Units to mg or ng for this answer*)

Storage location (Building and Room#):

_____

Use location (Building and Room#):

_____

Storage conditions (temperature, etc.) :

_____

Storage security (how is access restricted to the agent? I.e. locked doors, keycard access, locked freezer, and locked box):

Describe the inventory measures for your agent:

Describe how the agent will be transported from the storage location to the use or work location if different than the storage location.

What personal protective clothing, such as a lab coat, gloves and safety glasses, will be worn to protect personnel who must handle this agent (or care for animals or study subjects this has been administered to)?

Does this agent require reconstitution or the addition of a diluent? ☐ **Yes** ☐ **No**

If yes, please describe:

Will a sharp be used for any procedure involving this agent? ☐ **Yes** ☐ **No**

If yes, please describe the work practices, including waste disposal that will be used when working with this agent and a sharp:

How will lab, animal and/or clinical research waste from this agent be handled and disposed of?

Are there any special medical surveillance measures required for those individuals who will handle this agent, or research materials, animals or subjects who are inoculated with this agent? ☐ **Yes** ☐ **No**

If yes, please detail the special measures (such as an immunization)

Should anyone be restricted from handling this agent, such as immunocompromised staff members or others? ☐ **Yes** ☐ **No**

If yes, please list all of the conditions that may make an individual more susceptible or place these individuals at higher risk if exposed to the agent.

Please describe the emergency response procedures for:

A Spill of the agent, such as a dropped vial and release of the agent:

A percutaneous exposure (through the skin via a needle stick or other sharps exposure)?

(This also includes exposures to non-intact skin)

A splash to the facial mucous membranes of a person:

Do any of your experiments fall into any of the following experimental categories?

☐ **Yes** ☐ **No**

If yes, please check all that apply:

- ☐ Enhances the harmful consequences of the agent or toxin;
- ☐ Disrupts immunity or the effectiveness of an immunization against the agent or toxin without clinical and/ or agricultural justification;
- ☐ Confers to the agent or toxin resistance to clinically and/or agriculturally useful prophylactic or therapeutic interventions against that agent or toxin or facilitates their ability to evade detection methodologies;
- ☐ Increases the stability, transmissibility, or the ability to disseminate the agent or toxin;
- ☐ Alters the host range or tropism of the agent or toxin;
- ☐ Enhances the susceptibility of a host population to the agent or toxin; and
- ☐ Generates or reconstitutes an eradicated or extinct listed agent or toxin.
- ☐ Provide other knowledge, products or technologies that could be directly misapplied to pose a threat to public health and safety, agricultural crops and other plants, animals, the environment, or material.

For each box checked above, please explain why your research proposal meets the criteria for the types of experiments selected:

If you answered YES to the last question, please also complete the following questions. You do NOT have to complete the following questions if you answered 'NO' to the last question.

Points to Consider in Assessing Research for Its Dual Use Potential Consider

The points below to assess the potential risks associated with conducting the research in question or communicating its results. These points address some of the aspects of potential DURC that could be considered, but they are not exhaustive – IREs should augment these points to fit their needs and the research under consideration. This risk assessment is intended to assist IREs in determining whether the research in question meets the definition of DURC. In cases where the research is determined to be DURC, this assessment will also inform the subsequent process of identifying strategies for mitigating those risks.

1. The ways in which knowledge, information, technologies, or products from the research could be misused. Address the following questions and considerations regarding the nature and disposition of the knowledge, information, technology, or products that could be generated by the research under consideration:

a. What types of knowledge, information, technology, or products are anticipated to be generated through the research?

_____

b. How will the results or products of the research in question be shared or distributed? Knowledge, information, technology, or products that are freely available and widely distributed may be more easily accessed by individuals with harmful intent.

_____

Who will have access to the knowledge, information, technology, or final products?

_____

Will it be shared openly or remain within the laboratory?

_____

c. What is the novelty of the information provided by the research or of the research methods? Research that adds novel information or consolidates information in novel ways may be of greater concern, whereas information that is already widely available is generally of lower concern.

Have the results of the research been previously described or shared?

_____

If so, at what venues and in what detail?

_____

How readily available are these results?

_____

d. Are the products of the research under consideration applicable to other more common or less pathogenic organisms or agents? Knowledge, information, technology, or products generated from research that could be applied to more commonly available organisms to increase their associated risks may be of greater concern.

_____

e. Does the research highlight vulnerabilities in existing countermeasures or public health or agricultural infrastructure?

_____

Does the research highlight weaknesses in the ability to prepare for and respond to disease outbreaks that could impact public, agricultural, or environmental health?

_____

Does the research consolidate existing information in ways that highlight vulnerabilities in public health and/or safety preparedness?

_____

2. The ease with which the knowledge, information, technologies, or products might be directly misused and the feasibility of such misuse. IRE members are not expected to have expertise in national security, but IRE members and investigators in general are in a good position to make technical assessments about how readily and in what ways certain knowledge, information, technologies, or products obtained from research might be misused. Address the following questions and considerations regarding factors that impact the likelihood of misuse, including technical feasibility, level of expertise, necessary reagents, or the need for additional scientific advances or technologies.

a. Consider the technical expertise and/or physical resources that would be needed to apply the knowledge, information, technology, or product for malevolent purposes. The risk of misuse may be lower for knowledge, information, technologies, or products that would be expensive, difficult to procure, or that require a high degree of technical skill to facilitate such misuse.

Would it require a low or high degree of technical skill and sophistication to use the information from dual use research for harmful purposes?

_____

Would its misuse require materials, equipment, or reagents that are expensive or difficult to procure?

_____

b. Consider whether the products of the research in question could be directly misused to pose a threat to public health and safety, agriculture, plants, animals, the environment, materiel, or national security. The risk of misuse may be higher for research information that can be directly misused than for research information that requires significant additional scientific advances to facilitate its misapplication.

Can the products, information, or technologies generated from the research be directly misapplied? If so, how? _____

If not, do these outcomes of the research need to be combined with other knowledge, information, technology, or products in order to pose a threat?

_____

If so, is that other information already available?

_____

c. Consider the time frame in which information from the research might be misused. Information that can be misused in the near term may be of greater concern.

Is there concern about immediate or near-future potential use, or is the concern about misuse in the distant future?

_____

d. Given your responses to the preceding questions, how readily could the knowledge, information, technology, or products from the research be used to threaten public health and safety, agricultural crops and other plants, animals, the environment, materiel, or national security?

_____

3. Potential consequences of misuse. When considering the potential consequences of the misuse of scientific knowledge, information, technology, or products obtained from research, think broadly about the potential impacts on public health, agriculture, the environment, and/or the economy from the intentional misapplication of the results from the research in question. In general, information that could be misused to harm large populations of humans, plants, or animals; cause public panic; or require costly response efforts would be considered a greater risk.

a. Consider the nature of the potential consequences (e.g., harm to the economy, the environment, agriculture, or public health; public terror) that might result from misuse of the research results in question. Information that could be misused to harm numerous sectors of society or the environment may be of greater concern.

_____

b. Consider the scope and magnitude of the potential consequences. Research or research information that could be misused to cause severe harm, disease, or consequences is generally considered to be of greater concern.

Could the impact on people, plants, and/or animals be considered minor, moderate, or major?

_____

c. Consider the available countermeasures. Adequate countermeasures may help to decrease concern about the consequences of misuse. Countermeasures may include drugs, biological products, public health practices, pesticides, or devices intended for diagnosis, detection, mitigation, prevention, or treatment.

Are there currently any countermeasures to help mitigate the potential consequences?

_____

Are they readily available?

_____

5. Risk-Benefit Assessment of DURC For research that has been identified as DURC, it is important to assess the research for its anticipated benefits and to weigh those benefits with the risks identified in Step 4. This process will help determine the acceptable level of risk and inform the most appropriate mitigation strategies.

5.1 Points to Consider in Assessing the Benefits of the DURC

The benefits inherent to scientific research are many. Such benefits may impact various sectors of society and be realized over different time frames. The points below address some of the aspects of the research that could be considered, but they are not exhaustive – IREs should augment these points to fit their needs and the research under consideration.

a. Are there potential benefits to the public's health and/or safety from the research?

_____

b. Are there potential benefits of the research for agriculture, plants, animals, the environment, materiel, or national security?

_____

What potential solution does it offer to an identified problem or vulnerability?

_____

c. Will this research be useful to the scientific, public health, or public safety communities? If so, how?

_____

d. Because scientific research can have broad impacts, it is important to consider the scope of the potential benefits.

Will the knowledge, information, or technology generated from the research be broadly applicable (e.g., to human health, multiple scientific fields, populations of organisms)?

_____

What populations of plants or animals might be positively affected?

_____

e. If a benefit has been identified, in what time frame (e.g., immediate, near future, years from now) might this research benefit science, public health, agriculture, plants, animals, the environment, materiel, or national security?

5.2 Points to Consider for Weighing the Risks and Benefits of the DURC

This can be the most challenging step in the risk-benefit assessment; it is often described as a step that entails "weighing" or "balancing" the risks with or against the benefits of DURC. This language, however, suggests that risks and benefits can be quantified and that they are commensurable. This is rarely, if ever, the case.

The process of weighing the risks and benefits of DURC is an exercise in making defensible, rational judgments in the midst of unavoidable uncertainty. Uncertainty can best be managed by ensuring that the process draws on the expertise and perspectives of a group of individuals of diverse backgrounds and experience. Discussion and debate within such a group can help to (a) identify and mitigate the biases that individuals inevitably bring to the challenges of this sort, (b) uncover often implicit assumptions in arguments, (c) scrutinize and test the basis for judgments, and (d) yield conclusions that represent a consensus (literally, "a thinking together") and are optimally defensible.

a. Could the information of concern be more readily applied to improvements in surveillance or to the development of countermeasures than to malevolent applications? What reasons or evidence support the answer to this question?

b. What is the time frame in which potential benefits or anticipated risks might be realized?

c. How might the potential benefits and the anticipated risks be distributed across different populations (humans and animals)?

Who or what will be the likely beneficiaries of the potential benefits?

Will the potential benefits be distributed equally or disproportionately across different populations?

_____

(Here, it will be helpful to keep in mind that, for example, human populations may differ in terms of size: The potential benefits may accrue to a large or, alternatively, to a small number of individuals. Or, human populations may differ along socioeconomic or cultural lines: The potential benefits may accrue to or have little impact on a vulnerable or lower sourced population versus a well-resourced population.)

Who or what will bear the anticipated risks?

_____

Is it likely that one or more specific populations will bear the burden of the anticipated risks?

_____

Is it likely that the distribution of the anticipated risks and the potential benefits will be fair or just?

_____

d. Considering the anticipated risks in tandem with the potential benefits, are the risks of such a feasibility and magnitude that they warrant proceeding after developing and implementing a risk mitigation plan?

_____

Are the potential benefits of significant magnitude to warrant proceeding despite the risks?

_____

What is the most responsible way to proceed?

_____