Institutional Biosafety Committee (IBC) Protocol Registration Form

PROTOCOL #	BL-699
APPROVED:	12/07/2016
EXPIRES:	12/07/2021
OFFICE USE ONLY	

Section I. General Project Details

Sec. I-A. Principal Investigator (PI) Information

Principal Investigator (PI):_ Jay T. Lennon
Position:_ Professor
**Refer to the PI policy for information on who can serve as a PI **
Email:_ lennonj@indiana.edu
Campus:_Bloomington and Department:_Biology
Phone:_ 812-856-0962
Campus/Office Address:_ 261 Jordan Hall

Sec. I-B. Additional Contact Information

Emergency Lab Contact:_ Jay T. Lennon
Email:_ lennonj@indiana.edu
Phone (cannot be a campus phone number):_269-615-4984

Alternate/Administrative Contact:_Brent Lehmkuhl
Email:_ blehmkuh@indiana.edu
Phone:_ 812-856-7253

Sec. I-C-1. Protocol Information

This submission is a (*check [X] one):*
[ ] New Research Protocol [ ] Renewal: Previous IBC protocol: [#] [ ] New Teaching Protocol

[X] Submission: [#01]
[X] Study Amendment
[ ] Annual Continuing Review [Year:]

Project Title: Microbial seed banks

Section I-C-2. Submissions Record

I-C-2.a – Amending Your Protocol

If the current submission is an amendment to a previously approved protocol, please complete the Submissions Record Table, Sec. I-C-2.c by indicating the date submitted, amendment type (major or minor), and a brief amendment summary and incorporate the requested changes in the appropriate sections of the form using the "Track Changes" option on the "Review" ribbon in Word. If proposing a major and a minor amendment item simultaneously, please note them as two separate line items in the table. If you are amending your protocol during your Annual Continuing Review, please note the continuing review and amendment as one line item in the table. Please make sure to sign and date the form in Section XV, "Investigator Statement & Signature." Return your amendment submission to the Office of Research Compliance:

IUPUI, IUN, and all IUSM: ibcbhc@iupui.edu
IUB & Regionals: iubibc@indiana.edu

Sample Amendment Summaries:

Minor:	Adding/Removing Co-Investigators Adding/Changing/Removing Cell Lines Adding/Changing/Removing Transgenic Animals	Adding/Changing/Removing Laboratory Room Numbers Other; Please Describe
Major:	Adding/Changing Organism Adding/Changing Transgene Adding/Changing Infectious Agents	Upgrade in Containment Level Other; Please Describe

I-C-2.b – Annual Continuing Review

All previously approved research requires an Annual Continuing Review to assess any changes that have been made during the previous year. Annual Continuing Reviews should be entered into the Submission Record Table in I-C-2.c following the example "Submission #02."

Please review your protocol ensure the accuracy and completeness of the work. If any changes have been made to any section of the form (Personnel Change, Location Change, Research Description, Animal Use, etc.), please make the necessary updates by following the Amendment Instructions in Section I-C-2.a. Please list the continuing review and any necessary amendments as one line item in the table. Once you've reviewed your protocol, please make sure to sign and date the form in Section XV, "Investigator Statement & Signature." Return your continuing review submission to the Office of Research Compliance:

IUPUI, IUN, and all IUSM: ibcbhc@iupui.edu
IUB & Regionals: iubibc@indiana.edu

If you are no longer conducting the work covered by this IBC protocol, please contact the IBC Office using the appropriate email address above to terminate your study.

I-C-2.c – Submissions Record Table

Submission #	***Date Submitted***	***Submission Type (Major Amendment/Minor Amendment/Continuing Review)***	***Submission Summary***	***Date Approved***
Example: 01	*1/1/2015*	*Minor*	*Adding personnel;* *Adding new mouse strain*	
Example: 02	*3/1/2016*	*Annual Continuing Review*	*2015 Annual Continuing Review*	
01	*9/18/2017*	*Major*	*Adding new strains/study system: Mycoplasma* *Adding personnel* *Adding rooms*	10/03/2017

Note: To add additional lines to the table, please click the "+" sign on the left hand side of the last row.

Sec. I-D. Other Compliance Committee Approvals

[ ]Animal Research (IACUC):

[ ]Currently approved protocol(s): [#]Most recent approval date(s):[DATE]

[ ] Pending protocol(s): [#]Date submitted:[DATE]

** Note: IACUC approval must be granted prior to initiation of any vertebrate animal research**

[ ]Human Subjects Research (IRB):

[ ] Currently approved protocol(s): [#]Most recent approval date(s):[DATE]

[ ] Pending protocol(s): [#]Date submitted:[DATE]

[ ]Veterans Affairs Research (VA):

[ ] Currently approved protocol(s): [#]Most recent approval date(s):[DATE]

[ ] Pending protocol(s): [#]Date submitted:[DATE]

Note: If the research involves VA time, space, or money it must be reviewed by the VA SRS and R&D

Sec. I-E. Funding

[ ] Internal Funding

[ ] External Funding: Agency: :_

Grant Number: :_

[ ] VA Funding: Grant Number: :_

Sec. I-F. Investigators (List ALL personnel involved in this project) ?

Last Name, First Name <E-mail Address>	*Title/Job Description*	*OFFIC USE ONLY*	*NIH Guidelines*	*Bloodborne Pathogens*	*Biosafety*	*N95 Fit Test*	*Dual Use*	*Other*
Sample: Doe, Jane <jdoe@iu.edu>	Associate Professor / PI	**Required:** **Complete:**	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]
Lennon, Jay lennonj@indiana.edu	Associate Professor/ PI; oversees research	**Required:** **Complete:**	[X] [X]	[ ] [ ]	[X] [X]	[ ] [ ]	[ ] [ ]	[ ] [ ]
Lehmkuhl, Brent blehmkuh@indiana.edu	Technician; make protein and perform experiments	**Required:** **Complete:**	[X] [X]	[ ] [ ]	[X] [X]	[ ] [ ]	[ ] [ ]	[ ] [ ]
Venus Kuo vkuo@iu.edu	Ph.D. student; make protein and perform experiments	**Required:** **Complete:**	[X] [X]	[ ] [ ]	[X] [X]	[ ] [ ]	[ ] [ ]	[ ] [ ]
Moger-Reischer, Roy rzmogerr@indiana.edu	Ph.D. student; works with Mycoplasma	**Required:** **Complete:**	[X] [X]	[ ] [ ]	[X] [X]	[ ] [ ]	[ ] [ ]	[ ] [ ]
		Required: **Complete:**	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]
		Required: **Complete:**	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]
		Required: **Complete:**	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]
		Required: **Complete:**	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]
		Required: **Complete:**	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]	[ ] [ ]

[x] **Investigator Acknowledgement:** By checking this box, the PI is ensuring that all personnel listed on this protocol have access to the protocol, read it, agree to participate in said research activities, and will complete all necessary training requirements.

Sec. I-G. Research Location(s) Please list the building, room numbers, research activities performed in that space, and the highest biosafety level for that space and research activity. ?

Building	*Room #*	*Research Activities Performed*	*Biosafety Level*
Sample: R3	LARC	Transgenic Murine Models	BL-1
261	JH	growing cells, expressing and purifying protein	BL-1
261	JH	growing cells, extracting DNA	BL-2

**Note*: Please include Core Facility locations in the table.*

Section II. Research Description

Overall rationale for research in layman's terms (~250 words):

For the first recombinant project, we are making a protein that can be used to help understand how dormancy is terminated, which has implications for the persistence of bacteria including pathogens in hosts and the environment.

For the second recombinant project, we are interested in understanding how genome size influences the rate and trajectory of evolution in microbial populations

Description of planned experiments (no more than 2 pages). Describe the biological model systems you plan to use, the production methods of any infectious agent (viruses, bacteria, etc.) or biological toxin, and, in general, what types of experimental manipulations you are planning to achieve your primary endpoint(s). Ensure the use of biological reagents, animals, and cell lines mentioned elsewhere in the application are described here. At first mention, please write out completely all language that you intend to abbreviate in all subsequent sections of this form (***do not copy & paste from a grant proposal***):

For the first project, we are working with a protein called resuscitation promoting factor (Rpf) which is found in some Gram-positive bacteria. Rpf is a muralytic protein, which cleaves the B-1-4 link in peptidoglycan, a major cell wall component. We have cloned an rpf gene from a soil bacterium (KBS0714, Micrococcus sp.). Details including the physiology of this organism along with its 16S rRNA gene sequence can be found here https://goo.gl/rC1F2T and https://goo.gl/g4ITvE. The rpf gene was cloned into a plasmid (pET 15-b) that is being expressed in E. coli (Origami strain). After overexpressing Rpf in this strain we collect and column-purify the protein. We then use the Rpf to wake up single populations and communities (e.g. soil) of bacteria. A list of single populations of bacteria can be found here: https://goo.gl/rC1F2T and https://goo.gl/g4ITvE . Communities of bacteria come from soils collected from IUB campus, specifically Dunn Woods and the IU Research and Training Preserve near University Lake. All waste (including E. coli, protein, and solid/liquid material from experiments) is autoclaved before disposal.

For the second project, we will be working with populations of Mycoplasma mycoides. This strain has one of the smallest genomes of all known free-living bacteria. This has important implications for how bacteria evolve and may affect the rate at which beneficial mutations accumulate and fix in the population. We will test these hypotheses by comparing the evolution of two strains of Mycoplasma mycoides in an experiment that involves serial passage of the strains over time. Every 24-48 hrs, 1-10% of a culture will be transferred to new medium. Over time, we will harvest cells, extract DNA, and conduct pooled-populations sequencing to assess changes in allele frequencies. We will also measure the growth rate of evolved strains and compare them to that of the ancestral population to assess whether fitness changes over time. One of

the two strains we will be working with is *Mycoplasma mycoides* subspecies capri strain GM12. This strain is not capable of infecting humans, but is known as a goat pathogen. The other stain is JCVI-Syn3A, which is a derivative of the minimal bacterial cell JCVI-Syn3.0, which is a derivative of *Mycoplasma mycoides* subspecies capri strain GM12. This strain has been extensively described as it has been used to as part of a synthetic biology effort to identify the "minimal genome" whereby transposon mutagenesis was used eliminate non-essential genes. A description of the strains and work that has been done by the J. Craig Venter Institute (JCVI) who is supply the strains can be found here (http://www.pnas.org/content/103/2/425.full) and here (http://science.sciencemag.org/content/329/5987/52). Accurate whole-genome sequences assure that the two strains described above are not the Mycoplasmas that cause contagious caprine and bovine pleuropneumonia. All biological material and associated waste generated from our experiments will be discarded after autoclaving in accordance with BSL-2 guidelines. We have no plans for any additional recombinant work with these Mycoplasma strains, however, this might change in the future at which time we would provide additional detail in a formal amendment.

Section III. Experiments Covered by the *NIH Guidelines*

Section III-A: Sections of the *NIH Guidelines*

** Note: Choose ALL appropriate sections of the NIH Guidelines that apply to the proposed research**

[ ] **III-A**: **Experiments that require IBC, RAC review, and NIH Director approval before initiation.**

[ ] **III-A-1-a**: The deliberate transfer of a drug resistance trait to micro-organisms that are not known to acquire the trait naturally, if such acquisition could compromise the ability to control disease agents in Humans, veterinary medicine, or agriculture, will be reviewed by the RAC.

[ ] **III-B**: **Experiments that require NIH/OBA and IBC approval before initiation.**

[ ] **III-B-1**: Experiments involving the cloning of toxin molecules with LD_{50} of less than 100 nanograms per kilogram body weight.

[ ] **III-B-2**: Experiments that have been approved as Major Actions under Sec. III-A-1-a of the *NIH Guidelines*.

[ ] **III-C**: **Experiments that require IBC/IRB approvals and RAC review before research participant enrollment.**

[ ] **III-C-1**: Experiments Involving the Deliberate Transfer of Recombinant or Synthetic Nucleic Acid Molecules, or DNA or RNA Derived from Recombinant or Synthetic Nucleic Acid Molecules, into One or More Human Research Participants.

** Note: No research participant shall be enrolled until IBC and IRB approval has been granted and necessity of RAC review has been determined. (Appendix M, NIH Guidelines)**

** Note: Please complete Section VIII of this form for any research in which recombinant DNA or synthetic nucleic acid materials are being transferred into a human.**

[ ] **III-D: Experiments that require IBC approval before initiation.**

[ ] **III-D-1**: Experiments using Risk Group 2 (RG2), Risk Group 3 (RG3), Risk Group 4 (RG4), or restricted agents as host-vector systems.

[ ] **III-D-2**: Experiments in which DNA from RG2, RG3, RG4, or restricted agents is cloned into non-pathogenic prokaryotic or lower eukaryotic host-vector systems.

[ ] **III-D-3**: Experiments involving the use of infectious DNA or RNA viruses or defective DNA or RNA viruses in the presence of helper virus in tissue culture systems.

[ ] **III-D-4**: Experiments:

** Note: The breeding and cross breeding of registered transgenic rodents is exempt from the NIH Guidelines. (see Appendix C-VIII). The generation of transgenic rodents that require BL-1 containment are described under Sec. III-E-3. The purchase/transfer of transgenic rodents is exempt from the NIH Guidelines (See Appendix C-VII). **

[ ] Involving whole animals in which the animal's genome has been altered by stable introduction of recombinant or synthetic nucleic acid molecules, or DNA derived therefrom, into the germ-line (transgenic animals),

[ ] Experiments involving viable recombinant or synthetic nucleic acid molecule-modified microorganisms tested on whole animals

[ ] **Appendix Q**: Experiments involving large animals

[ ] **III-D-5**: Experiments involving whole plants

[ ] **III-D-6**: Experiments involving more than 10 liters of culture *(in one container).*

[ ] **III-D-7**: Experiments involving influenza viruses.

[ ] **III-E: Experiments that require IBC notice simultaneous with initiation.** ALL experiments not included in Sections III-A, III-B, III-D, III-F, and their subsections are non-exempt from the *NIH Guidelines* and fall under Section III-E. All Such experiments may be conducted at BL-1. The IBC reviews and approves all such proposals, but IBC review and approval prior to initiation of the experiments is not required.

[ ] **III-E-1**: Experiments involving the formation of recombinant or synthetic nucleic acid molecules containing no more than $^{2}/_{3}$ of the genome of any Eukaryotic virus.

[ ] **III-E-2**: Experiments involving whole plants.

[ ] **III-E-3**: Experiments involving transgenic rodents: involving the generation rodents in which the animal's genome has been altered by stable introduction of recombinant or synthetic nucleic acid molecules, or nucleic acids derived therefrom, into the germ-line. Only experiments that require BL1 containment are covered under this section; experiments that require BL2 or higher containment fall under section III-D-4 above.

** Note: Only experiments that require BL-1 containment are covered under Sec III-E-3. **

[X] **III-F**: **Experiments that are exempt from the *NIH Guidelines*.**

[ ] **III-F-1**: Uses synthetic nucleic acids that:

(1) Can neither replicate nor generate nucleic acids that can replicate in any living cell, and
(2) Are not designed to integrate into DNA, and
(3) Do not produce a toxin that is lethal for vertebrates at an LD_{50} of less than 100 nanograms per kilogram of body weight.

[ ] **III-F-2**: Those that are not in organisms, cells, or viruses and that have not been modified or manipulated to render them capable of penetrating cellular membranes.

[ ] **III-F-3**: Those that consist solely of the exact recombinant or synthetic nucleic acid sequence from a single source that exists contemporaneously in nature.

[ ] **III-F-4**: Those that consist entirely of nucleic acids from a prokaryotic host, including its indigenous plasmids or viruses when propagated only in that host (or closely related strain of the same species), or when transferred to another host by well-established physiological means.

[ ] **III-F-5**: Those that consist entirely of nucleic acids from a eukaryotic host including its chloroplasts, mitochondria, or plasmids (but excluding viruses) when propagated only in that host (or a closely related strain of the same species).

[ ] **III-F-6**: Those that consist entirely of DNA segments from different species that exchange DNA by known physiological processes, though one or more of the segments may be a synthetic equivalent.

[ ] **III-F-7**: Those genomic DNA molecules that have acquired a transposable element, provided the transposable element does not contain any recombinant and/or synthetic DNA.

[X] **III-F-8**: Those that do not present a significant risk to health or the environment, as determined by the NIH Director, with the advice of the RAC, and following appropriate notice and opportunity for public comment. (You **MUST** check one of the *Appendix C* exemptions below)

[ ] **Appendix C-I**: Experiments involving the formation of recombinant or synthetic nucleic acid molecules containing no more than ½ of the genome of any Eukaryotic viral genome that are propagated and maintained in cells in tissue culture.

Host-Vector System Exemptions:

[X] **Appendix C-II: *Escherichia coli K-12* Host-Vector Systems**.

[ ] **Appendix C-III: *Saccharomyces* Host-Vector Systems**.

[ ] **Appendix C-IV: *Kluyveromyces* Host-Vector Systems**.

[ ] **Appendix C-V: *Bacillus subtilis*OR *Bacillus licheniformis* Host-Vector Systems**.

[ ] **Appendix C-VI: Extrachromosomal Elements of Gram Positive Organisms**.

Transgenic Rodent Exemptions:

[ ] **Appendix C-VII**: The purchase or transfer of transgenic rodents at BL-1.

[ ] **Appendix C-VIII**: Generation of BL1 transgenic rodents via breeding.

Note: See also the Animal Experiments Covered under the NIH Guidelines Reference Table

Section III-B. Recombinant DNA (rDNA) and Synthetic Nucleic Acid Molecule Information

In the table below, please provide the original source of inserted DNA, the vector(s) (recombinant viruses), used to insert into the host, all hosts, including intermediate, in which it will be inserted, and the gene or transcription product to follow. Also, if the gene or transcription product is known to be harmful (e.g. oncogenic, toxic, mutated gene), please provide details. Any viruses included in this table should also be included in Section IV: Viral Vectors. ?

Source Species of inserted DNA	*Plasmid and/or Vector(s) (recombinant viruses) to be used*	*Plasmid Source or attach Plasmid map*	*Host(s) to be used (Please include all intermediate hosts) E.g.: human cells, mouse cells*	*What is the gene or transcription product*	*Is it known to be harmful (e.g. Oncogenic, Toxic, Mutated Gene) to researcher or*

					environment? If yes, please describe:
Example: Human	pcDNA3.1	https://www.lifetechnologies.com/order/catalog/product/V79020	*E. coli*, drosophila cells	RalGDS1	no
Example: HIV and VSV	Packaging plasmid (pRSV-Rev), gag/pol plasmids (pMDLg/pRRE), env plasmid (pMD2.G)	Addgene #12253, 12259,12251	Human cells	plasmids to make lentiviral particles	no
Example: Human	pLKO.1	See attached map	Human cells	WNT shRNA	no
Micrococcus (KBS0714)	pET-15B	https://www.emdmillipore.com/US/en/product/pET-15b-DNA---Novagen,EMD_BIO-69661?bd=1	E. coli	Rpf	no

Section IV. Viral Vectors (recombinant viruses)

[x] Check this box if no viral vectors are being used and proceed to Section V.

IV-A. Non-Lentiviral Vectors

Viral Vectors (other than lentiviral vectors, see IV-B for lentiviral vectors) ***If no non-lentiviral vectors are being used, please skip to IV-B.***	***If validation tests to confirm replication incompetence were performed, please describe.*** **Note: adenoviral vectors are always considered replication competent due to the environmental concerns and the wide propensity of wild-type serotypes; therefore, they must be handled at BL-2.**	***Are you using any helper viruses or packaging/producer cell lines? Please describe.***	***List any essential genes that have been deleted from the vector/packaging system.***	***Does the viral vector have an expanded host range or increase tissue tropism compared to wild-type virus? (i.e.: product now potentially infectious in other organisms/cells not normally infected)?***	***Source of viral vector (E.g.: produced in your lab, produced in other IU PI Lab [please list], produced by outside vendor [please provide technical information as a weblink, attachment, or scientific citation]).*** ***If you amplify or produce your own viral particle stock, please indicate "produced in your lab."***	***Does this project involve large scale (>10 liters of culture in one container) research or production?*** ***If yes, please see Appendix K of the NIH Guidelines.***

IV-B. Lentiviral Vectors

Are you using a lentiviral vector system?	***Is TAT encoded on any system component?*** ***If yes, please describe.***	***Are you using only a 3rd generation lentiviral vector system?*** ***If no, please provide the plasmid map information (attach to form).*** ***If performing replication competent lentivirus (RCL) testing, indicate how the RCL testing will be performed (Serial passage of exposed permissive cells with endpoint testing for p24 by ELISA based commercially available test kits, Lentiviral IU Vector Core to perform, Certified replication incompetent by supplier, other). List all that apply.*** **Note: certificates of analysis may be subject to audit and therefore must be retained by lab.**	***Source of viral vector (E.g.: produced in your lab, produced in other IU PI Lab [please list], produced by outside vendor [please provide technical information as a weblink, attachment, or scientific citation]).***	***Does this project involve large scale (>10 liters of culture in one container) research or production?*** ***If yes, please see Appendix K of the NIH Guidelines***

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Section V. Biological Materials

[ ] Check this box if no biological materials are being used and proceed to Section VI.

Add rows as needed ?

Note: All hosts cells/cell lines, tissues, blood or other bloodborne pathogen material*, microorganisms, bacteria, and viral vector particles, should also be included here.

Note: If you are a Mac user and are experiencing trouble with the following table, or seeing blank columns, please contact the IBC Office at 812-855-0656 for assistance. You may also try adjusting the magnification of the document past 100%.

							*Potential Routes of Transmission (check [X] all applicable routes) *RG2 and higher*			
	Biological Material	***Source***	***Infectious Host Range *RG2 and higher***	***Check if Zoonotic***	***Risk Group (RG)***	***Containment Level/Biosafety Level (BL)***	***Injection****	***Ingestion****	***Inhalation****	***Direct contact open wound or mucous membranes****
EX1	***Example***: HEK 293 cells	ATTC	Humans		RG2	BL-2	X			X
EX2	***Example:*** *V. cholerae*	Dr. John Doe at U. Penn	Humans, birds, shellfish, fish, herbivores		RG2	BL-2	X	X		X
01.	E. coli	https://www.emdmillipore.com/US/en/product/Origami%E2%84%A2-2(DE3)pLysS-Competent-Cells---Novagen,EMD_BIO-71346	NA		RG1	BL-1				
02.	Micrococcus	https://goo.gl/rC1F2T and https://goo.gl/g4ITvE	NA		RG1	BL-1				
03.	Other soil bacteria	https://goo.gl/rC1F2T and https://goo.gl/g4ITvE	NA		RG1	BL-1				

04.	Mycoplasma mycoides subspecies capri strain GM12	JCVI via the Mycoplasma culture collection of the International Organization for Mycoplasmology	Known to infect goats, but does not cause contagious caprine and bovine pleuropneumonia		RG2	BL-2				
05.		JCVI with funding from the forprofit company Synthetic Genomics Inc.	May still infect goats but greatly reduced genome makes this less likely	RG2	BL-2					
06.										
07.										
08.										
09.										
10.										

Note*: Work with human or primate cell lines is considered RG2/BL2 and requires annual Bloodborne Pathogen training.

Note*: RG1 agents can be infectious to immunocompromised individuals or cause allergic reaction.

1. **Should exposure occur, list all of the potential risks associated with exposure. Please use the corresponding line number from the table above for each item.** Regarding lines 2 and 3 above, although the bacteria being used are BL1 it is possible to have BL2 pathogenic bacteria in the soil samples. Lab personnel working with these strains are made aware that there is potential risk associated with working with all bacteria and that some bacteria encountered from samples like soil have the potential to be pathogenic depending on host (i.e. researcher) health and immune stats. The are instructed to be aware of symptoms associated with infection, and that in the case of such signs, they should notify the PI should they have a concern.

Regarding lines 4 and 5, these bacteria are related to Mycoplasma strains that are known to infect goats, however, the strains are likely attenuated though domestication and genome reduction via synthetic biology (knockouts) described in links to papers that have been used to study the minimal genome. Nevertheless, we are currently in the process of making are lab BSL-2 to accommodate the strains.

EX2. *V. cholera* – Needle stick, laceration, bite, and contact with non-intact skin: Wash the area with soap and running water. Do not apply bleach, alcohol, or other disinfectants to the skin.
Mucous membranes: If contaminated material is splashed or sprayed into the eyes, flush the eyes for 10-15 minutes. If material is ingested, rinse mouth out with clean water.
Ingestion of contaminated materials: Seek medical attention. Monitor for symptoms, Report all exposures to the Principal Investigator and seek medical evaluation.

2. Are you using Biological Toxins?

[x] **No**

[ ] **Yes; check all that apply below:**

[ ] LD_{50} of biological toxin: _
[ ] Symptoms of exposure to toxin (List):_
[ ] Toxin inactivation procedures: _
[ ] Total amount of any non Select Agent toxin: _

3. Are you using Transactive or Infectious Proteins (e.g. Prion Proteins)?

[x] **No**

[ ] **Yes; check all that apply below:**

[ ] Protein: _
[ ] Agent: _
[ ] Cellular Target: _

[ ] Hazards of Exposure: _

Section VI. Potential Dual Use

1. **Please check any of the nonattenuated agents or toxins that will be used in this study:**
   - [ ] **Avian influenze virus (highly pathogenic)**
   - [ ] **Bacillus anthracis**
   - [ ] **Botulinum neurotoxin**
   - [ ] **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**
   - [ ] **Other:** _
2. **Will your research enhance the harmful consequences of the agent or toxin:**
   - [x] **No**
   - [ ] **Yes, please describe and provide a risk mitigation plan:** _
3. **Will your research disrupt immunity or the effectiveness of an immunization against the agent or toxin without clinical and/or agricultural justification:**
   - [x] **No**
   - [ ] **Yes, please describe and provide a risk mitigation plan:** _
4. **Will your research add resistance to clinically and/or agriculturally useful prophylactic or therapeutic interventions against that agent or toxin or facilitates their ability to evade detection methodologies:**
   - [x] **No**
   - [ ] **Yes, please describe and provide a risk mitigation plan:** _
5. **Will your research increase the stability, transmissibility, or the ability to disseminate the agent or toxin:**
   - [x] **No**
   - [ ] **Yes, please describe and provide a risk mitigation plan:** _
6. **Will your research alter the host range or tropism of the agent or toxin:**
   - [x] **No**
   - [ ] **Yes, please describe and provide a risk mitigation plan:** _
7. **Will your research enhance susceptibility of a host population to the agent or toxin:**
   - [x] **No**
   - [ ] **Yes, please describe and provide a risk mitigation plan:** _
8. **Will your research generate or reconstitute an eradicated or extinct agent or toxin listed above:**
   - [x] **No**
   - [ ] **Yes, please describe and provide a risk mitigation plan:** _
9. **If you answered yes to any of the questions above, have you completed the required DURC training?:**
   - [x] **No. Please complete the required DURC training.**
   - [ ] **Yes, please describe and provide a risk mitigation plan:** _

Section VII. Select Agents and Toxins

[X] Check this box if no select agents and/or toxins are being used and proceed to Section VIII.

1. **For any select agents and/or toxins being used in this study, please list and contact the Biosafety Office:** _

** Note: Reference **CDC** - **National Select Agent Registry** for a list of permissible toxin amounts.**

** Note: Reference 42 CR 73 Possession, Use, and Transfer of Select Agents and Toxins; Final Rule for a comprehensive list of select agents and toxins.**

2. Please list the largest amount of exempt select agent toxin investigator will have in their possession at any given time: _

3. Will this study be identifying any select agents and/or toxins in humans, soil, or the environment?

[ ] **No**

[ ] **Yes** ***[provide a list of potential select agents, description of sample source(s)]***: _

Section VIII. Human Gene Transfer (HGT)

[X] Check this box if no transfer of recombinant DNA or synthetic nucleic acid molecules into one or more human research participants is occurring in this study and proceed to Section IX.

1. Is this the initial clinical trial site?

[ ] **No; has the initial site registered with NIH OSP?**

[ ] **No**

[ ] **Yes, skip to question 3.**

[ ] **Yes**

2. Does this research meet any of the following criteria?

[ ] **The protocol uses a new vector, genetic material, or delivery methodology that represents a first-in-human experience, thus presenting an unknown risk;**

[ ] **The protocol relies on preclinical safety data that were obtained using a new preclinical model system of unknown and unconfirmed value;**

[ ] **The proposed vector, gene construct, or method of delivery is associated with possible toxicities that are not widely known and that may render it difficult for oversight bodies to evaluate the protocol rigorously.**

3. Does this research have an investigator brochure?

[ ] **No**. Without the investigator brochure, the submission is incomplete and cannot be reviewed.

[ ] **Yes, please attach brochure to this application:** _

4. Does this research have an informed consent?

[ ] **No**. Without an informed consent, the submission is incomplete and cannot be reviewed.

[ ] **Yes, please attach consent form to this application:** _

5. What pharmacy will be used for storage purposes?

Name: _

Address: _

Containment level(s): _

Note: Disposal of waste, including bandages, from humans must be described in Section XIII.

Section IX. Use of Animals* or Animal Materials in Research

[X] Check here and proceed to Section X if no animals are being used in this research project.

Note: For IBC purposes, "animals" includes any organism in the kingdom Anamalia.

1. Please list all animal species (vertebrates, invertebrates, genetically modified, or non-genetically modified).

_

Note: Invertebrates do not require an IACUC protocol. All vertebrates DO require an IACUC protocol.

2. Are any biological materials used in research with animals? Please make sure to include all materials listed in Section V, if being used with animals.

[ ] **No**.

[ ] **Yes; check all that apply below and describe each selection in detail in Section II and Section V above:**

- [ ] **This study involves the use of wild-type or attenuated microbial pathogens in animals.**
- [ ] **This study involves the direct administration of nucleic acids or viral or plasmid vectors to animals.**
- [ ] **This study involves the use of xenografts.**
- [ ] **This study involves the use of transfected or transduced cells inoculated into animals.**

[ ] **Other; please describe:** _

3. Are any recombinant or synthetic nucleic acid molecules used in research with animals?

[ ] **No**.

[ ] **Yes; check all that apply below and describe each selection in detail in Section II and Section V above:**

- [ ] **This study involves the use of wild-type or attenuated microbial pathogens in animals.**
- [ ] **This study involves the direct administration of nucleic acids or viral or plasmid vectors to animals.**
- [ ] **This study involves the use of xenografts.**
- [ ] **This study involves the use of transfected or transduced cells inoculated into animals.**

[ ] **Other; please describe:** _

Sec. IX-A. Genetically Modified Mammalian and/or Avian Animals

1. Will genetically-modified, mammalian/avian animals be used in this research project?

[ ] **No**

[ ] **Yes; Complete table in question 3.**

2. Are genetically-modified rodents produced with the assistance of the IU School of Medicine Transgenic Core Facility?

[ ] **No**.

[ ] **Yes, the following method(s) will be used to make the transgenic animals:**

- [ ] **Microinjection of gene into fertilized oocytes**
- [ ] **Insertion of gene(s) into embryonic stem cells microinjected into oocytes**
- [ ] **Use of vectors to transfect oocytes**
- [ ] **Other method(s), please include description:** _

** Note: Also complete the Transgenic Core Registration Form.**

3. Genetically-modified, Mammalian/Avian Table 

Animal Species	*How your lab refers to this strain** **Note: Must match the name used in your IACUC protocol.**	*Original Source of Animal** **Note: Please provide vendor number if applicable. If animals being maintained in your lab, please include the original source.**	*Knockout (KO), Knock-In (KI), Transgene (T)*	*Gene Modified (genes added or removed)*	*Potential Hazard(s)? Please list. (human/animal)*	*Biological Source of Gene*
Example: Mouse	Actin-Cre	Jackson Labs 006139	T	Actin Promoter Cre	n/a	Mouse and P1 bacteriophage

Sec. IX-B. Genetically Modified, Non-Mammalian/Non-Avian Animals

1. Are genetically modified, non-mammalian/non-avian Animals being used?

[ ] No. Please proceed to Section X.

[ ] Yes; Please describe in Section II.

2. Are the genetically modified, non-mammalian/non-avian animals used in this project known to be harmful (e.g. Oncogenic, Toxic) to the researcher and/or the environment?

[ ] No.

[ ] Yes; please describe hazard(s) in detail in Section II above.

3. How will the non-mammalian/non-avian animals be used? _

Section X. Recombinant or Synthetic Nucleic Acid Molecules in Plants

[x] Check here and proceed to Section XI if no plants or arthropods associated with plant disease are being used in this research project.

1. Please list all plant species used in your research: _

2. Please check all types of experiments that apply

BL1-P experiments:

[ ] Planned experiments use recombinant or synthetic nucleic acid molecule-modified plants that are not noxious weeds or that cannot interbreed with noxious weeds in the immediate geographic area

[ ] Planned experiments use whole plants and recombinant or synthetic nucleic acid molecule-modified non-exotic microorganisms that have no recognized potential for rapid and widespread dissemination or for serious detrimental impact on managed or natural ecosystems (e.g., *Rhizobium* spp. and *Agrobacterium* spp.)

BL2-P experiments:

[ ] Planned experiments use plants modified by recombinant or synthetic nucleic acid molecules that are noxious weeds or can interbreed with noxious weeds in the immediate geographic area.

[ ] Planned experiments use plants in which the introduced DNA represents the complete genome of a non-exotic infectious agent.

[ ] Planned experiments use plants associated with recombinant or synthetic nucleic acid molecule- modified non-exotic microorganisms that have a recognized potential for serious detrimental impact on managed or natural ecosystems.

[ ] Planned experiments use plants associated with recombinant or synthetic nucleic acid molecule-modified exotic microorganisms that have no recognized potential for serious detrimental impact on managed or natural ecosystems.

[ ] Planned experiments use recombinant or synthetic nucleic acid molecule-modified arthropods or small animals associated with plants, or with arthropods or small animals with recombinant or synthetic nucleic acid molecule-modified microorganisms associated with them if the recombinant or synthetic nucleic acid molecule-modified microorganisms have no recognized potential for serious detrimental impact on managed or natural ecosystems.

BL3-P experiments:

[ ] Planned experiments use exotic infectious agent with recognized potential for serious detrimental impact on managed or natural ecosystems.

[ ] Planned experiments use cloned genomes of readily transmissible exotic infectious agents with recognized potential for serious detrimental effects on managed or natural ecosystems in which there exists the possibility of reconstituting the complete and functional genome of the infectious agent by genomic complementation *in planta.*

[ ] Planned experiments use microbial pathogens of insects or small animals associated with plants if the recombinant or synthetic nucleic acid molecule-modified organism has a recognized potential for serious detrimental impact on managed or natural ecosystems.

Section XI. Biosafety Level/Containment Selection

Sec. XI-A. Please check the highest appropriate physical containment level for the proposed research.

Biohazards or recombinant DNA:	[] BL-1	[X] BL-2	[ ] BL-2 w/ BL-3 practices	[ ] BL-3
Animal Research:	[ ] ABL-1	[ ] ABL-2	[ ] ABL-3	

Lentiviral vector Containment:

[ ] BL-2: Cell culture work, no delivery into animals

[ ] BL-2: Non-pathogenic/non-oncogenic gene inserts

[ ] BL-2: Lentivirus transduced mouse cell that will be injected into animals

[ ] BL-2 with BL-3 practices: Any lentiviral vector that is not produced using 3rd generation (4 plasmid) system that will not be tested for replication competence

[ ] BL-2 with BL-3 practices: Pathogenic/oncogenic gene inserts and/or large scale research

[ ] BL-2 with BL-3 practices: Injection of lentiviral vector directly into an animal. Animal housing may drop to ABL-1 after 72 hours. Work with animal tissues will remain at BL-2.

[ ] BL-2 with BL-3 practices: Injection of lentiviral vector-transduced human cells into animals or injected lentiviral vector into animals engrafted with human cells.

Sec. XI-B. Biosafety Level 1

[X] Follow practices as described below

[ ] Deviate from practices described below, please explain: _

Standard Biosafety Level 1 practices:

a. Handwashing: Hands must be washed immediately or as soon as feasible after removing gloves or other personal protective clothing.
b. Personal Protective Equipment (PPE): PPE such as gloves, safety glasses and a laboratory coat should be worn whenever biological work is conducted in the laboratory. No sandals are allowed in the laboratory.
c. Use of Sharps: Minimize the use of and exposure to sharps in the workplace. Never recap, bend or shear needles. As often as possible, replace glassware with less damaging materials such as plastic. Keep sharps containers readily available in all locations where sharps waste may be generated. In order to avoid accidental injury, do not overfill sharps containers.
d. Food and Beverage: Eating, drinking, storing food and drink for human consumption, smoking, applying cosmetics or lip balm and handling contact lenses in the laboratory or other work areas is prohibited. This prohibition shall be well posted.
e. Aerosol Generation: Any procedures that could potentially generate aerosols or other inhalation hazards must be performed in a manner that will minimize airborne pathogen transmission.
f. Proper Labeling: Place a color-coded label incorporating the universal biohazard symbol on any potentially contaminated equipment or work surface to warn others of biohazard contamination that may not be easily visible. This includes freezers, refrigerators and incubators.
g. Autoclave Safety: Always wear heat-resistant gloves, goggles or safety glasses, and a laboratory coat when opening an autoclave. Be sure to allow the superheated steam to exit before attempting to remove the contents.
h. Spills: Always clean spills from the periphery of the spill towards the center, after placing paper towels over the spill. Make sure that the cleaning materials are disposed of in an appropriate manner. Report all spills to the Biological Safety Office.
i. Mouth Pipetting: Mouth pipetting may lead to accidental ingestion of biological specimens and is strictly prohibited.
j. Decontamination Procedures: A fresh 0.5 – 1 percent sodium hypochlorite (a 1 to 10-20 dilution of household bleach) will be used to decontaminate equipment, work surfaces, and liquid waste. In locations where bleach would cause corrosion, an iodophor (e.g., Wescodyne) will be used to decontaminate. All solid waste shall be autoclaved prior to disposal.
k. Local Transport of Biological Materials: All biological materials transported to and from the laboratory will be enclosed in a primary container with a sealed lid or top, which will then be enclosed in a secondary leak-proof, rigid container (e.g., a Coleman cooler) appropriately labeled with biohazard symbol. A responsible lab employee shall escort any specimens transported to and from off-campus satellite facilities.
l. Storage: All infectious materials to be stored will be clearly labeled with the universal biohazard symbol as will the storage space (e.g., freezers and refrigerators).
m. No open-toed shoes, shorts, or short skirts are allowed in the laboratory for all biosafety levels.

Sec. XI-C. Biosafety Level 2

[X] Follow practices as described below **in addition to** the Biosafety Level 1 practices listed above

[ ] Deviate from practices described below, please explain: _

Standard Biosafety Level 2 practices:

a. Use of Sharps: Minimize the use of and exposure to sharps in the workplace. Never recap, bend or shear needles. As often as possible, replace glassware with less damaging materials such as plastic. Keep sharps containers readily available in all locations where sharps waste may be generated. In order to avoid accidental injury, do not overfill sharps containers.
b. Attention to sharps; use of safety needles when possible
c. Local Transport of Infectious Materials: All infectious materials transported to and from the laboratory will be enclosed in a primary container with a sealed lid or top, which will then be enclosed in a secondary leak-proof, rigid container (e.g., a Coleman cooler) appropriately labeled with biohazard symbol. A responsible lab employee shall escort any specimens transported to and from off-campus satellite facilities. Packaging and labeling must comply with the IATA dangerous goods or DOT hazardous materials regulations.
d. Bloodborne Pathogens: All PIs using human blood or blood products, unfixed tissue, body fluids or organ or cell cultures of human origin will follow the procedures outlined in the IU Bloodborne Pathogen Exposure Control Plan.
e. No plants shall be allowed in the laboratory.
f. Transport of Select Agents/Toxins: EH&S must be notified of all transfers or shipments off campus.
g. The PI is responsible for developing laboratory SOPs and training laboratory staff in specific procedures.

h. Procedures with a potential for creating aerosols or splashes must be conducted inside a biological safety cabinet or with other appropriate personal protective equipment as determined by the Biosafety Office (BSO).

Sec. XI-D. Biosafety Level 2 with Biosafety Level 3 Practices

[ ] Follow practices as described below **in addition to** the Biosafety Level 1 and 2 practices listed above

[ ] Deviate from practices described below, please explain: _

Standard Biosafety Level 2 with Biosafety Level 3 practices:

a. All pipetting involving the agent shall be performed in a Class II Biological Safety Cabinet (BSC).
b. All vortexing of materials shall be performed using sealed containers and only within a Class II BSC.
c. All small animal work involving the agent(s) shall be performed within a Class II BSC. This includes, but not limited to, injections, necropsy, surgery, tissue removal and cellular manipulations.
d. All centrifugation of agents and/or unfixed animal material shall be done using aerosol resistant buckets. These buckets should only be opened and loaded within a Class II BSC.
e. Use of personal protective equipment intended to reduce the potential for mucosal exposure
f. Sharps with engineered sharps injury protections will be used whenever possible for needles and scalpels.
g. No glass will be used with biological agents unless required (e.g. plastic aspirating pipets will be used in place of glass Pasteur pipets).

Sec. XI-E. Biosafety Level 3

[ ] Follow practices as described below **in addition** to the Biosafety Level 1, 2, and 2 w/ 3 practices listed above

[ ] Deviate from practices described below, please explain: _

All BL3 procedures, training and safety precautions have been documented and reviewed by the Biosafety Office.

Section XII. Personal Protective Equipment (PPE) & Laboratory Practices

Sec. XII-A. Personal Protective Equipment (PPE) and Safety Equipment (*check [X] for all those that apply):*

Non-Animal Research

[x] Gloves [x] Eye Protection [x] Laboratory Coat

[ ] Face Shield [ ] Respirator: _

[ ] Chemical Fume Hood [X] Biosafety Cabinet [ ] Glove box Isolator

[ ] Other: _

Animal Research (Mammalian/Avian research only)

[ ] Gloves [ ] Eye Protection [ ] Disposable Gown

[ ] Face Shield [ ] Surgical Mask [ ] Respirator:_

[ ] Chemical Fume Hood [ ] Biosafety Cabinet [ ] Glove box Isolator

[ ] Animal containment/caging:_ [ ] Other: _

Sec. XII-B. Laboratory Practices (*check [X] for all those that apply):*

[ ] Needles and syringes are not recapped or reused

[ ] Sharp containers are only 2/3 full before disposal

[ ] Chemical restraint (animals)

[ ] Physical Restraint (animals)

[ ] Biological material transported outside of the laboratory in rigid container with lid and biohazard symbol

[ ] Biological material transported outside of the laboratory in other container (describe): _

[ ] Vortexing/mixing/centrifugation performed in tightly capped tubes

[ ] Centrifugation performed in aerosol containment capsules for BL3 containment

[ ] Pipetting in Biosafety Cabinet

[ ] Other Techniques performed in Biosafety Cabinet: _

[ ] Other Techniques performed on bench top: _

Sec. XII-C. Laboratory Access (*check [X] for all those that apply):*

[ ] Limited to personnel listed on protocol

[ ] Locked laboratories with limited public access

[x] Other: _ the lab doors are kept closed while work is in progress and locked when no one is present

Sec. XII-D. Health Surveillance/Immunization (*check [X] for all those that apply):*

[ ] Hepatitis B Vaccine offered

[ ] Orthopoxviruses (vaccinia and others)

[ ] Other Vaccine: _

[ ] Custom health surveillance/immunization program: _

[ ] Serum sample banking: Consult with Environmental Health and Safety - Biological Safety Office (BSO)

Section XIII. Decontamination and Waste Disposal Procedures

Sec. XIII-A. Lab or Surface Disinfectant (*check [X] for all those that apply):*

[x] 10% commercial bleach (0.5% sodium hypochlorite) with 10 minutes contact time

[x] 70% Ethanol with 10 minutes contact time

[ ] Other Disinfectant:_ Contact Time: _ Concentration:_

Sec. XIII-B. Solid Waste (*check [X] for all those that apply):*

[x] Materials will be autoclaved for a minimum of 15 minutes, at 121°C, under 15 psi (pounds per square inch)

[ ] Chemical Inactivation: Chemical: _ Contact Time:_

[ ] Other: _

[ ] Mammalian/avian animal carcasses are frozen, EHS is contacted to pick them up and dispose of them (Bloomington)

[ ] Animal carcasses are returned to animal facility for disposal (IUPUI)

[ ] Animal carcass, including invertebrate, disposal, Other: _

Sec. XIII-C. Liquid Waste (*check [X] for all those that apply):*

[ ] Commercial bleach (equivalent to .5% sodium hypochlorite), with 30 minutes contact time

Note: Final concentration of bleach after addition of biological research materials should be at least 10%

[x] Other: _ autoclave min of 15 mins, at 121C, under 15 psi; depending on the volume of liquid being autoclaved the autoclave cycle may need to be adjusted to ensure full sterilization

Sec. XIII-D. Infectious Sharps (*check [X] for all those that apply):*

[ ] Puncture resistant container with a biohazard symbol: autoclaved prior to disposal

Sec. XIII-E. Equipment decontamination procedure

Please detail how you will decontaminate equipment: _

Section XIV. Reporting

By signing this form, I agree to abide by all university and federal guidelines and regulations regarding recombinant or synthetic nucleic acid molecules, infectious agents, and/or human tissues and fluids in research.

Indiana University researchers and affiliates must immediately report to the Biosafety Office (BSO)—Indianapolis or Bloomington—any one or more of the following events:

- Any incident which results in the release of recombinant DNA or synthetic nucleic acid molecules to the environment (including escape of a transgenic animal)
- Any spill of recombinant DNA-containing material outside of a biological safety cabinet.
- Any research-related incidents and illnesses (including needle sticks and bites from transgenic or infected animals).
- Spills and accidents involving wild type infectious organisms, organisms containing recombinant or synthetic nucleic acid molecules, or potentially infectious material which result in overt personnel exposure.
- Spills and accidents in any NIH nonexempt animal laboratory that result in environmental release or exposures of animals or laboratory workers to organisms containing recombinant or synthetic nucleic acid molecules.
- Any problems at any biosafety level pertaining to the operation and implementation of containment practices and procedures, violations of the *NIH Guidelines.*

[x] By checking this box, I understand that I am responsible for ensuring compliance with all applicable regulations and the terms of protocol approval.

Section XV. Investigator Statement & Signature

The Principal Investigator is responsible for providing adequate training and supervision of staff in microbiological techniques and practices required to ensure safety and for procedures in dealing with accidents. The investigator is responsible for enforcing federal regulations regarding laboratory safety for all persons who work under his/her direction. The investigator is responsible for correcting work errors and conditions that may result in the release of recombinant DNA or synthetic nucleic acid materials, biohazardous materials, or infectious agents and ensuring the integrity of the physical containment. Any work-related injury or exposure must be reported to Occupational Health Services. The investigator is also responsible for ensuring that co-investigators, if any, employ the necessary safeguards to protect laboratory personnel, students, and the community from potential hazards posed by the project. The investigator must ensure that staff has read this protocol and the Biosafety manual.

I certify that I have read the above statements and agree that I and all listed participants will abide by those statements as well as all university and campus policies and procedures governing the use of infectious agents and other biological materials as outlined in this application and in the campus specific Biosafety Manual. In addition, I will:

- Abide by the General Duty Clause of OSHA and take full responsibility to ensure that listed personnel have received or will receive appropriate training in safe laboratory practices and procedures for this protocol before any work begins on this project and at least annually thereafter. Also, all listed personnel who have occupational exposure to bloodborne pathogens will be trained annually;
- Follow the health surveillance practices as approved for this protocol and inform those working on the protocol about appropriate emergency assistance information for their location(s);
- Inform Employee Health Services, the IBC and the NIH OBA of any research-related accident or illness as soon as possible after its occurrence as per *NIH Guidelines* Section IV-B-7-e-(2);
- Submit in writing a request for approval from the IBC of any significant modifications to the study, facilities or procedures; and;
- Adhere to campus-specific Biosafety guidelines referred to in this application as well as comply with the requirements of the Biosafety Manual.

I understand my responsibility with regard to laboratory safety and certify that the protocol as approved by the IBC will be followed during the period covered by this research project. Any future changes will be submitted for IBC review and approval prior to implementation.

To ensure that the IBC has the most current information when reviewing a study, it has established a 5-year re-review policy for on-going IBC studies. The policy requires principal investigators (PIs) to submit a new application to the IBC at the time of continuing review every 5 years the study remains open. I understand that this protocol will also be reviewed periodically; it is my responsibility to complete and submit the survey form used for the periodic IBC review in a timely manner. I will resubmit a full application every 5 years as is IBC policy.

Jay Lennon	09/18/2017
Principal Investigator Signature	Date

[X] Type name above and check for electronic signature

IBC OFFICE USE ONLY

Amanda Snyder	10/3/2017
Biosafety Office Representative (if applicable)	Approval Date
Institutional Biosafety Committee Member	Approval Date
Holly A. H. Moore — Digitally signed by Holly A. H. Moore DN: cn=Holly A. H. Moore, o=Indiana University, ou=Office of Research Compliance, email=holmoore@iu.edu, c=US Date: 2017.10.03 14:56:30 -04'00'	10/03/2017
Office of Research Compliance	Final Approval Date