**CHILDREN'S HOSPITAL BOSTON**
**Meeting of Boston Children's Hospital Institutional Biosafety Committee**
**AGENDA**
**8/21/2025 11:30 AM to 1:00 PM**
**KARP 4th Floor, Conference Room**

Present: MM, SVH, EG, SG, KK, CH, DC, EC, JM, SD, BS, PW

Absent: IJ, TW, DF, HD

Guests:

RSLO: JF, DH, AL

## 1 Administrative Updates

- BSL-3 annual validation is scheduled for September 15th – 22nd

- FDA Requests Sarepta Therapeutics Suspend Distribution of Elevidys: FDA Requests Sarepta Therapeutics Suspend Distribution of Elevidys and Places Clinical Trials on Hold for Multiple Gene Therapy Products Following 3 Deaths | FDA

- Herpes Simplex Virus (HSV-1) Training **(**HSV Training): Modifications were requested by the committee. The Guideline will be reviewed again at the next meeting:

**Modifications Requested by Committee:**

1. Discuss other HSV-based gene delivery methods (e.g, aerosol inhalation via nebulizers) for diseases other than neurotropic and oncolytic diseases such as cystic fibrosis treatment.
2. Include that HSV may pose a reproductive risk.
3. Include AAV vectors and how it's different from.
4. Include a recommendation for post exposure prophylaxis for staff after risk assessment.

- Research Laboratory Blood Sampling and The Phlebotomy Space Criteria in Basic Research Buildings & Laboratories: Modification requested by the committee. Guidelines will be reviewed at the next meeting.
    - Phlebotomy Space Criteria in Research Laboratories
    - Research Laboratory Members Blood Sampling by Unlicensed Study Staff via Venipuncture

**Modifications Requested by Committee:**

- Simply the guidelines so it will be easier for labs to follow.
- Licensed phlebotomists require extensive training to be certified. This training is just as extensive and not feasible. The training does not grant certification to trainees and is only required by those performing blood draws in research labs.
- Consider whether it is more cost effective to have one phlebotomist per department rather than requiring all trainees to complete this training.
- Note that some labs perform blood draws infrequently (once or twice per year), making the training less useful or expired before the next procedure.
- Update "access to hand hygiene sink or alcohol-based hand rub" to access to a sink.
- Update disposal methods to distinguish between regulated and unregulated waste, including biohazard and regular waste disposal streams.
- Update "access to alcohol pads" to "sterile-alcohol pads".
- List the STIK pages.

## 2 Laboratory Events

1. **NIH Guidelines Non-compliant Event**

- **Incident summary:** It was identified that a lab was conducting laboratory work involving recombinant DNA (second generation Lentivirus) and MSCV without approval from the Institutional Biosafety Committee (IBC). A registration draft was initiated; however, it was not submitted for review. Upon discovery, the work was ceased.
- **Root Cause:**
  - Failure to submit a protocol and obtain IBC approval before conducting work with recombinant DNA.
- **Corrective Actions:**
  - A member of the biosafety team will attend an upcoming lab meeting to discuss the event, NIH Guidelines and institutional policies.
  - The PI has submitted the IBC protocol to be reviewed for approval.
  - PI will ensure that the lab adhere to IBC policy and proactively seek guidance for compliance.

2. **IBC Non-compliant Follow- up:**

- **Event Summary:** Work involving *Staphylococcus aureus* had not been approved by the IBC and was not included in the IBC protocol. Additionally, a researcher actively working with biological materials was not listed on the current protocol.

- **PI's Response:** Protocol review process is now in place; bi-weekly reviews will be conducted by the PI, and amendment will be submitted as needed. Work with *Staphylococcus aureus* was not included likely due to confusion with *Streptococcus pyogenes*, which has been removed from the protocol.

## 3 New submission – Laboratory

**IBC-P00001765** Role of Virus-like DNA repeats in Health and Disease

**PI** **SZL**

**Motion:** Modification Required for Approval – Return to IBC Analyst

Discussion: **IBC Discussion**: This lab studies protein-DNA interactions using human and mouse cell lines. Lentiviral and murine stem cell virus (MSCV) retroviral systems are used to deliver tagged proteins, including genes associated with latent viral infection pathways, into these cells. The resulting protein expression is analyzed using immunofluorescence and immunoblotting. Lentiviral production is carried out by co-transfecting cells with packaging plasmids, including those encoding the VSV-G envelope protein. All procedures involving human cell lines and lentiviral particles are performed under BSL-2 work practices.

**Regulations Applicable to this Protocol:** NIH Guidelines Sections III-D, III-E and the OSHA Bloodborne Pathogen Standards.

**Motion: Modifications Required for Approval**

- Majority (Approved): 11
- Minority (Against): 0
- Abstention: 0

**Modifications Requested:**

- The committee recommends elaborating on the details of each experiment.

- Specify which DNA-binding proteins are being tested and provide some context for the selection of multiple human cell lines compared to a single mouse cell line.
- Expand the description of downstream assays beyond general molecular biology techniques to provide a clearer picture of the experimental approach.
- Clarify what DNA binding proteins are transduced into human and mouse cells.
- Provide a few sentences on the human cell lines and with scientific justification for why they are chosen.
- Update the *E. coli* entry and list the genes used in this system. Additionally, indicate antibiotic resistance for plasmid transfection and list the antibiotics that will be used.
- Update the MSCV entry to clarify the statement regarding the use of an ecotropic virus to transduce human cells, as this is not accurate. Indicate that the vector is replication incompetent.
- Clarify whether the vector is amplified; if so, indicate this and describe the amplification method.
- Uncheck “bleach” and select "70% Ethanol" as the appropriate surface deactivation method for MSCV.
- Update the lentivirus entry by removing the general reference to “proteins of the human genome” and replacing it with the specific proteins you are studying. This is especially important given your focus on tagged proto-oncogenes and tumor suppressors below.
- Include the specific genes being introduced and describe their associated pathways in the scientific description.
- Specify the method used for virus amplification (e.g., ultracentrifugation), as “Maxi prep” listed here is incorrect.
- Uncheck ' Bleach" and select "70% Ethanol' as an appropriate disinfectant.
- Specify the gene(s) that are cloned into the pcDNA vector. Clarify whether any of them are oncogenes, toxins, or immune-modulating proteins.
- Specify the exact genes involved in the latent viral infection - clearly identify the specific tumor suppressor, proto-oncogene, and latent viral infection genes you will be studying, avoid general descriptions.
- Indicate “homogenization”, if cell shearing is conducted with a blunt needle, and describe how and where homogenization is performed in the scientific description.
- Confirm if materials are processed outside the cabinet. Clarify whether sorting or microscopy will be performed with non-fixed cells.
- Clarify the materials that will be shipped and indicate whether the shipments are domestic or international.

- Update the BSL-2 entry to include MSCV production using HEK cells.

**IBC-A04-253-7** Amendment 7 : Characterization of Mutant Mouse Strains and Human Genetic Diseases

**PI:** **MF**

**Motion:** Modification Required for Approval – Return to IBC Analyst

Discussion: **IBC Discussion**: This study aims to identify and functionally validate genes involved in blood and iron

disorders by analyzing spontaneous or induced mutations in mice and humans using positional cloning or sequencing. A range of genes, including HJV, FECH, and others, will be targeted using Cas9 or lentiviral methods in various red blood cell model systems, with modifications in CD34+ cells tested in mice. This amendment adds a recently identified human mutation in an HNF4A transcription factor binding site within the HJV gene to the list of targets for lentiviral and includes the use of the HUH7 cell line for modeling. All work is conducted at BSL-2 work practices and procedures.

**Motion: Modifications Required for Approval**

- Majority (Approved): 11
- Minority (Against): 0
- Abstention: 0

**Modifications Requested:**

- Include the technology that will be used for lentiviral targeting. Specify whether the genes of interest will be knocked down, knocked out or overexpressed.
- Include the vectors that will be used.
- Clarify if the gene targeting studies proposed using Crispr/Cas9 technology will be performed using an expression vector or lentivirus.
- Remove all studies referenced 'in the future' and submit them as amendments when appropriate.
- Describe the targeting vectors that will be used to generate the DNA constructs and the ES cell lines used.
- Include injections in mice in the animal research study section.
- Specify the vectors and genes used in yeast studies.

- Add HNF4A and HJA genes in Lentivirus Human immunodeficiency virus section.
- Specify the cell lines used in the scientific description.
- The scientific description indicates the use of patient fibroblasts. If so, include unfixed tissues that will be collected for generation of fibroblast cell lines in this section. Indicate if fibroblast primary cell lines will be obtained commercially or generated in the lab.
- Indicate if fibroblasts will be isolated from patient tissue in the lab.
- Reconcile the IRB numbers with those listed in the scientific description.
- Clarify what aspects of generating transgenic mice will be done in your lab.

**IBC-A08-042-17** Amendment 17 : Molecular Analysis of Mammalian Innate Immunity

**PI:** **JK**

**Motion:** Modification Required for Approval – Return to IBC Analyst

Discussion: **IBC Discussion**: This protocol investigates host-pathogen interactions using a range of viruses and

bacteria. Viruses such as influenza A, hepatitis C, and LCMV are propagated, stored, and used to infect mammalian cells or mice to study immune responses, pathogen replication, gene function, and the effects of immunomodulatory treatments. Additional experiments include genetic manipulation of mammalian cells, use of human PBMCs, tumor immunotherapy models, and various in vivo infection models, including liver abscesses, pneumonia, and skin abscesses. This amendment adds Staphylococcus epidermidis, Lactococcus lactis, and Lactobacillus plantarum to the list of bacteria. Staphylococcus epidermidis is a gram-positive bacterium that is part of the normal human microbiota and is considered a human opportunistic pathogen. Lactococcus lactis and Lactobacillus plantarum are also Gram-positive bacteria, commonly found in the human microbiota, but are non-pathogenic. Work with Lactococcus lactis and Lactobacillus plantarum will be performed under BSL-1 conditions. Work with Staphylococcus epidermidis will be conducted under BSL-2 conditions.

**Motion: Modifications Required for Approval**

- Majority (Approved): 11
- Minority (Against): 0
- Abstention: 0

**Modifications Requested:**

- Specify that Staph epidermidis is an opportunistic pathogen that should be handled at BSL-2.

- Describe the potential biohazards associated with the use of Staph epidermidis.
- Include the hazard for a potential needlestick with the organism.
- A staff member is soon due for the IBC training.
- Reproductive toxicology consult is offered to researchers working with LCMV.
- Clarify whether the human blood is sourced from the BCH blood bank or from an external source and reconcile with the scientific description.
- Modify to either Clidox or Sporklenz, as bleach is not available in the Animal Facility.
- Add lactobacilli to BSL-1 and ABSL-1. Update the BSL-2 and ABSL-2 entries to include Staph epidermidis.

**IBC-A09-021-14** Amendment 14 : Engineering vascularized therapeutic implants

**PI:** **JMM**

**Motion:** Modification Required for Approval – Return to IBC Analyst

Discussion: **IBC Discussion**: The lab uses a two-cell strategy to bioengineer human vascular networks in vivo. The

strategy involves co-implanting human bone marrow-derived mesenchymal stem cells (MSCs) and human blood-derived endothelial colony-forming cells (ECFCs) within a biocompatible hydrogel. The cell-hydrogel mixture is injected subcutaneously into immunodeficient mice, where it forms a structured vascular network that integrates with the host vasculature with the goal of developing novel therapies for diseases wherein protracted administration of therapeutic proteins is needed. This amendment includes the use of genetically modified IPSC-derived cardiovascular cells which will be implanted into wild-type rats to evaluate their immunogenicity and engraftment potential in an immunocompetent host. Work with human cells and tissues, transduction of murine cells using lentiviral vectors and preparation of IPSCs will be done at BSL-2 while injection of animals with human cells will be done at ABSL-2 inoculation and ABSL-1 housing.

**Regulations Applicable to this Protocol:** NIH Guidelines section III-D and OSHA Bloodborne Pathogen Standards.

**Motion: Modifications Required for Approval**

- Majority (Approved): 11
- Minority (Against): 0
- Abstention: 0

**Modifications Requested:**

- Rewrite this section in layman terms, so that it may be understood by nonscientific members of IBC.
- Include a brief description about muscle regeneration in mice.
- Include rate work here as well.
- Remove the duplicated statement: "Virus are generated in HEK 293T with Virapower Lentiviral packaging mix and Lipofectamine 2000 (Invitrogen)". Clarify that the final product is a HIV-1-based lentivirus.
- Clarify where peripheral and cord blood, as well as other tissues are collected and how they are safely transported to the lab.
- Select NIH Guidelines section III-D.
- Select 'Oncogenes' in the Update the Recombinant DNA section (Bacterial plasmid pEB-C5 entry).
- Describe the source of human materials.
- Provide an updated IACUC protocol number.
- Update to include rats, and if surgery is performed to inject cardiac muscle, include the sharp instruments used here.
- Describe where biological materials will be shipped and indicate whether these will be domestic or international.

**IBC-A06-114-4** Amendment 4 : Recombinant DNA Constructs encoding proteins involved in synaptic and neurodevelopmental proteins

PI: TS

Motion: Modification Required for Approval – Return to IBC Analyst

Discussion: **IBC Discussion**: The lab studies the mechanisms involved in the formation of functional

synapses in nerve cells during development and learning using intro and animal-based models. Genes of interest are inserted into mammalian expression vectors and introduced into primary rodent neurons, iPSC-derived neurons, and cell lines either by transfection (e.g., Lipofectamine) or by transduction using AAV or lentivirus, to evaluate gene functions. The amendment adds an antisense oligonucleotide (ASO) targeting mouse SARM1 in a mouse model of neurodegeneration. AAV will also be used for intravitreal injection in mice retinas as a neuroprotective strategy. Work with lentivirus for transduction of rat and mouse primary cells, and human cell lines will be done at BSL-2 while AAV injections into mice will be done at ABSL-1 work practices and procedures.

**Regulations Applicable to this Protocol:** NIH Guideline Section III-D.

**Motion: Modifications Required for Approval**

- Majority (Approved): 11
- Minority (Against): 0
- Abstention: 0

**Modifications Requested:**

- Include a brief synopsis of mouse studies proposed in your amendment.
- Specify the source of IPS cells and how they are immortalized.
- Specify which neurodegenerative mouse model will be used for neuron isolation in cell culture experiments, and how long after ASO is added to the vitreous humor the eyes, and the method of examination in the scientific description.
- Include ASO targeting Sarm1 and control ASOs to the plasmid used in the Recombinant DNA section.
- Add a section on ASO-treated mice to the Animal Research Study section
- Update IACUC protocol number.
- Indicate cryostat/microtome use for histological studies
- Describe the transport of ASOs to the Animal Facility, and lentiviral and AAV vectors to and from the viral cores. Note that a self-sealable transport container should be used as a secondary container and not Styrofoam or cardboard boxes.
- Add ASO injections into mouse vitreous humor of the eye to Animal Biosafety Level 1.

**IBC-A05-109-5** Amendment 5 : Expression of recombinant proteins for structural and functional studies

**PI:** **TS**

**Motion:** Modification Required for Approval – Return to IBC Analyst

**Discussion:** **IBC Discussion:** The lab works with recombinant proteins from cDNA of mice and human genes

involved in immune regulation. The lab studies the structure of these proteins and develop antibodies against them. The amendment is for the addition of human colon, ileum, and duodenum

cells that will be manipulated and grown in culture. They will also include shipping procedures for murine cells, purified proteins and plasmids for domestic and international travel. All work will human cell lines will be conducted at BSL-2 procedures.

**Motion: Modifications Required for Approval**

- Majority (Approved): 11
- Minority (Against): 0
- Abstention: 0

**Modifications Requested:**

- Describe how the human cells will be used, including whether they are grown to produce proteins or modified in any way.
- Clarify what is being shipped internationally, as additional training may be required.

**IBC-RN10-326-9** Renewal 9 : Molecular analysis of parasite replication and pathogenesis

PI: JD

Motion: Modification Required for Approval – Return to IBC Analyst

Discussion: **IBC Discussion**:The lab investigates the molecular mechanisms underlying Plasmodium

replication and pathogenesis in host red blood cells, with the goal of designing novel antimalarial medications using in vitro and animal-based systems. In this renewal, the lab will assess the potential contribution of P. falciparum infection to the pathogenesis of Epstein-Barr virus (EBV). To achieve this, anonymized human red blood cells infected with P. falciparum will be co-cultured with tonsil organoids. Resulting phenotypic effects will be characterized using flow cytometry, qRT-PCR, and immunofluorescence microscopy. Work with human red blood cells, human-derived organoids, Plasmodium will be performed at BSL-2, and inoculations of Plasmodium in mice will be done at ABSL-2 work practices and procedures.

**Regulations Applicable to this Protocol:**NIH Guidelines Sections III-D and OSHA Bloodborne Pathogen Standards.

**Motion: Modifications Required for Approval**

- Majority (Approved): 12
- Minority (Against): 0
- Abstention: 0

**Modifications Requested:**

- Provide additional context for studying the interaction between Plasmodium and EBV, including how the two organisms are related.
- Update this section to reflect future studies.
- Clarify whether rhesus RBCs are tested to confirm they are Herpes B negative and list the testing method.
- List FACS sorting in BSL-2 contained sorter.
- Describe how infected organoids are transported from collaborating institutions.
- Remove the room number for ARCH, as no IACUC protocol has been submitted.
- The committee recommends implementing additional safety measures when transporting culture plates with infected cells, such as parafilm around the plate if possible, or an absorbent material inside the primary container (ziplock) in case of spill during transport. Ensure the primary and secondary containers have appropriate hazard label.
- Select 'Animal Biosafety Level 2 (ABSL-2) inoculation and Animal Biosafety Level 1 (ABSL-1) housing.

**IBC-RN11-294-4** Renewal 4 : Flu Vaccinology and Structure and Assembly of Viruses

PI: SH

Motion: Modification Required for Approval – Return to IBC Analyst

Discussion: **IBC Discussion**: The lab investigates the mechanisms of viral entry into cells by

analyzing viral proteins and macromolecular complexes using biophysical techniques such as X-ray crystallography, cryo-electron microscopy, and live imaging. This renewal includes the production of adeno-associated virus type 2 (AAV2) by transfecting HeLa cells with the pAV2 plasmid, which carries the AAV2 genome linearized with Bgl II. Following transfection, human adenovirus type 2 is introduced as a helper virus, and the cells are subsequently harvested. Post infection, AAV/Ad is purified using iodixanol density gradient centrifugation and heparin agarose affinity chromatography. All work involving the handling of AAV/Ad, as well as the production and propagation of AAV/Ad is conducted using BSL-2 work practices. in a BSC.

**Regulations Applicable to this Protocol:** NIH Guidelines section III-D and OSHA Bloodborne Pathogen Standards.

**Motion: Modifications Required for Approval**

- Majority (Approved): 12
- Minority (Against): 0
- Abstention: 0

**Modifications Requested:**

- Check off "Will your research involve the use of materials from non-human primates?" as the protocol involves COS-1 and MA-104 cells, which are derived from African green monkeys (non-human primates).
- Some staff members are due for the IBC Training.
- Confirm whether Influenza is being used in your work. If so, ensure that all research staff complete the required Influenza Training.
- Update both *E. coli* entries to indicate antibiotic resistance, as common antibiotics are listed.
- Select “Red Biohazard Waste Container” as the appropriate option for solid waste disposal.
- Remove the added enhancements listed under the BSL-1 and BSL-2 entries.

| **6** | **Human Study Annual Reconfirmation** | |
|---|---|---|
| **IBC-P00001982** | Multi-Center, Open Label Study of RP-A501 in Male Patients with Danon Disease | |
| | PI: | **DA** |
| | Motion: | Approved |
| | Discussion: | The study is active – Closed to Enrollment. |
| **IBC-P00000650** | A Phase I/II trial of lentiviral gene transfer for SCID-X1 with low dose targeted busulfan conditioning | |
| | PI: | **SP** |
| | Motion: | Approved |

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| | Discussion: | The study is open and active to enrollment. There have been no SAE's. Participants that have received the full dose are doing clinically well. Two additional participants have been enrolled. |

| 7 | **Administrative Reviews** | |
|---|---|---|
| **IBC-RN00000205-4** | Renewal 4 : Control of gene expression in Pseudomonas aeruginosa | |
| | PI: | **SD** |
| | Motion: | Approved |
| | Discussion: | The protocol focuses on studying DNA-Binding Proteins, RNA binding proteins, and sRNAs in P. aeruginosa. The experiments on DNA-binding proteins focus more on regulators controlling biofilm formation and interbacterial interactions. RIL-Seq experiments are under different growth conditions and in multiple P. aeruginosa strains. Experiments on RNA-binding proteins include CLIP-Seq and CLAP-Seq, using UV crosslinking. It also expands the study of RNA-binding proteins by including additional regulators like PhaF and involves more in vitro biochemical assays using purified proteins from E. coli. Work is conducted at BSL-2 practices. |
| **IBC-RN10-104-4** | Renewal 4 : Protocol title 12 Aug 2019: Evaluation of immune responses to BCG (Mycobacterium bovis) vaccine. | |
| | PI: | **OL** |
| | Motion: | Approved |
| | Discussion: | This is a three-year renewal with no changes to the risk assessment. |

**IBC-A11-052-21** Amendment 21 : Molecular regulation of retinal angiogenesis and retinopathy

PI: **LS**

Motion: Approved

Discussion: This amendment includes the addition of human iPSC-derived retinal organoids obtained by a collaborator, which will be cultured and utilized for mitochondrial function assays, transcriptomic profiling, and proteomic analyses. All work involving human derived retinal organoids will be conducted at BSL-2 work practices.

**IBC-RN05-011-5** Renewal 5 : RNAi Knockdown of Genes Important During Myoblast Fusion

PI: **EG**

Motion: Approved

Discussion: This is a three-year renewal with no changes or updates to the risk assessment.

**IBC-A00002127-1** Amendment 1 : Molecular regulation of neurovascular retina

PI: **ZF**

Motion: Approved

Discussion: The lab is adding iPSC-derived mature retinal organoids to support their retinal biology studies. Work with Human retinal organoids will be performed at BSL-2 work practices and procedures. The update does not change the risk assessment.

**IBC-A00001586-5** Amendment 5 : Human Neuron Core

PI: **MS**

Motion: Approved

Discussion: This amendment includes the use of an AAV9-like viral vector to transduce organotypic human brain slices as part of an already approved procedure. All AAV9-like vector work in human brain slices will be conducted under BSL-2 work practices and procedures.

**IBC-RN00000152-4** Renewal 4 : Role of the Microbiota in Oral and Respiratory Tolerance

PI: **TC**

Motion: Approved

Discussion: This is a three-year renewal with no changes or updates to the risk assessment.

**IBC-RN00001327-1** Renewal 1 : Gene regulatory control of neural crest development

PI: **MS**

Motion: Approved

Discussion: The renewal adds human cell lines to their study. This does not change the risk assessment.

**IBC-P00002120** In vitro use of measles containing vaccines

PI: **OL**

Motion: Approved

Discussion: This lab will investigate immune responses to licensed measles-containing vaccines (MMR and MMRV) using human in vitro models. The lab is currently approved to work with MMR and MMRV vaccines in a separate protocol. Primary human peripheral blood mononuclear cells (PBMCs) and autologous plasma will be used in tissue culture. In some experiments, specific leukocyte populations including monocytes, B cells, or T cells will be enriched by magnetic isolation and cultured in 10% autologous plasma prior to stimulation. Following in vitro stimulation with vaccine components, immune responses will be assessed by measuring cytokines and chemokines using bead-based assays (Luminex) and proteomic analyses (Olink). Cellular responses will also be evaluated using flow cytometry and/or RNA sequencing. All procedures involving human blood, plasma, and cell culture will be conducted under BSL-2 conditions.

**IBC-A00002052-1** Amendment 1 : CHORD-DB-OTO-001

PI: **AS**

Motion: Approved

Discussion: This amendment converts the original open-label Phase 1/2 safety and dose-finding study of DB-OTO in children with biallelic OTOF variants into a harmonized global registrational trial, prompted by early compelling efficacy results and a favorable safety profile. The Investigator Brochure, Protocol, Informed Consent, and trial design were updated. There were no updates or changes to the risk assessment of the investigational drug DB-OTO.

**IBC-RN00000885-2** Renewal 2 : GVHD/Cellular Therapy/PREDICT

PI: **LK**

Motion: Approved

Discussion: This is a three-year renewal with no changes or updates to the risk assessment.

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| **IBC-RN00001689-1** | Renewal 1 : Cardiovascular regeneration and repair | |
| | PI: | **MC** |
| | Motion: | Approved |
| | Agenda Notes: | This is a three-year renewal with no changes or updates to the risk assessment. |

| **8** | **Laboratory Study Annual Reconfirmation** | |
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| **IBC-P00000750** | Vaccine development against Group B streptococcus (streptococcus agalactiae) | |
| | PI: | **YL** |

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| **IBC-P00001433** | Neutrophil response to bacteria | |
| | PI: | **KY** |

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| **IBC-P00001285** | Cardiovascular biology | |
| | PI: | **CB** |

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| **11-235** | Enabling Vaccines through Improved Understanding of Immune-Triggering Events in human blood |

PI: **OL**

**08-052** Growth of Vascular Malformations: Determining the Role of the Endothelium

PI: **AG**

**IBC-P00001929** Virulence determinants of Bacterial pathogens and the emergence of antimicrobial resistance

PI: **TVO**

**IBC-P00001772** Mechanisms of host immunity

PI: **JC**

**IBC-P00000566** Defining the optimal disinfection method for needleless connectors

PI: **GP**

**IBC-P00001327** Gene regulatory control of neural crest development

PI: **MS**

**IBC-P00000089** Role of ABCB5 in stem cells

PI: **MF**

**IBC-P00002028** Processing of plasma samples for Hydrogen-FAST Trial

PI: **JK**

**IBC-P00000072** ALK role in lymphoma, lung carcinoma and neuroblastoma and principles that govern translocation formation in mouse and human cells

PI: **RC**

**09-021** Engineering vascularized therapeutic implants

PI: **JMM**

**IBC-P00000146** Use of Human Mesenchymal Stem Cells in animal models of Pulmonary Hypertension

PI: **SK**

**IBC-P00000051** Knockdown, knockout and overexpression of genes using lentiviruses.

PI: **LZ**

**IBC-P00001908** Exploiting Antigen Presentation Pathways for Precision Immune Engineering

PI: **NP**

**11-139** Differentiation of nociceptive neurons

PI: **CW**

**IBC-P00000519** Epsin in angiogenesis, lymphangiogenesis, and atherosclerosis

PI: **HC**

**01-074** Discovery and Characterization of Molecules which Contribute to Prostate Cancer Progression, Including Proliferation, Metastasis and Angiogenesis

PI: **BZ**

**IBC-P00000107** Molecular Basis of Pediatric Overgrowth Phenotypes

PI: **BL**

**IBC-P00001784** Genovese Lab

PI: **PG**

**08-073** Cell Biology of Proteoglycans in Microbial Pathogenesis and Host Defense

PI: **PWP**

**05-057** Molecular Genetics of Neuromuscular Disorders, Autism and Interstitial Cystitis

PI: **LK**

**00-130** Transplantation of Human Muscle Cells for the Treatment of Muscular Dystrophy

PI: **EG**

**IBC-P00001200** Study of SARS-CoV-2

PI: **JK**

**IBC-P00001104** Dirty mice and skin immunology

PI: **SD**

**IBC-P00001977** Pharmacological manipulation of neuronal activity

PI: **BS**

**IBC-P00000268** The effect of silencing sensory neuron on chronic allergic airway inflammation

PI: **CW**

| **9** | **Completions** |
|---|---|

**IBC-P00001114** Pet-store co-housing

PI: **RG**

**IBC-P00000686** Molecular analysis of Antigen Presentation 1

PI: **HP**

**IBC-P00000687** Molecular Analysis of antigen presentation of pathogens

PI: **HP**

**IBC-P00000690** Innate immunity and cell-autonomous immunity against virus .

PI: **HP**

**IBC-P00001936** Models of Human Disease

PI: **HP**

**IBC-P00000688** Use of Retrovirus and Lentivirus to Deliver Transgenes to Primary Hematopoietic Cells

PI: **HP**

**IBC-P00000319** Gene transfer for XCGD

PI: **DW**