UCI Biosafety Guidance for SARS- Coronavirus-2 (COVID-19) research

Approved by IBC and UCI SARS-CoV-2 Biosafety Task Force, June 17, 2020

#	Research material	Type	Procedures	Assigned practices[3] and containment level	Additional information (Questions/Concerns)
Human Specimen					
I	Human specimen from COVID19 patients[1] Low Risk - Plasma - Serum - Peripheral Blood Mononuclear Cells (PBMCs) - Urine - Semen - Low risk specimen in DNA/RNA Shield - Low risk specimen in Viral Transfer Media (VTM)	Non-inactivated	Receiving	- Open secondary container inside a certified Biosafety cabinet - Containment level - **BSL2**	- IBC approval required - SOP available, contact IBC@uci.edu
			Handling – All Procedures	- Processing, aliquoting and preparing for inactivation[2] must be done inside a BSC - Nucleic acid/Protein extraction – Must be completed inside the BSC - All other work must be done inside the BSC. If assays cannot be carried out inside BSC, IBC will provide additional guidance - Containment level - **BSL2** and **BSL1**	- IBC approval required - SOP required by IBC. Submit SOP with your IBC protocol
			Isolation of virus	- Can only be done in a **BSL3** facility	- IBC and HCLOG[4] approval required
		Inactivated[2]	Receiving & Handling	- Ensure proper inactivation[2] procedures have been used prior to receiving samples. - If a new method has been used, contact IBC to ensure inactivation method is proper. Once the inactivation[2] method is approved by IBC and the task force, specimen can be handled on a benchtop - Containment level - **BSL1**	- Contact IBC@uci.edu
II	Human specimen from COVID19 patients High Risk - Sputum - Broncho-Alveolar Lavage (BAL) - Tracheal aspirates - Nasopharyngeal swabs - High risk specimen in VTM - Feces	Non-inactivated	Receiving	- Same as I - Non-inactivated - Receiving	- IBC approval required - SOP available, contact IBC@uci.edu
			Handling – Low Risk Procedures	- Same as I - Non-inactivated - Handling	
			Handling - High Risk Procedures	- Assays that cannot be carried out inside BSC including Flow Cytometry analysis, ELISA plate washes - IBC will provide additional guidance - Containment level - **BSL2** and **BSL1**	
		Inactivated[2]	Receiving & Handling	- Same as I – Inactivated Receiving & Handling	- Contact IBC@uci.edu
Virus					
III	Generating Pseudovirus with SARS-CoV-2 protein	Live virus	Handling	- Practices and containment will be determined by IBC based on the Pseudovirus generated - Containment level will be based on the nature of Pseudovirus	- IBC approval required
IV	SARS-CoV-2 Virus	Live virus	Receiving & Handling	- Can only be opened and handled in a **BSL3** facility	- IBC and HCLOG[4] approval required
V	SARS-CoV-2-Virus	Inactivated	Receiving & Handling	- Same as I – Inactivated Receiving & Handling	- Contact IBC@uci.edu

	Work with Animals and Animal Specimens				
VI	Infecting animals with SARS-CoV-2	Live virus	Handling	- Can only be handled in a **ABSL3** facility	- IBC and HCLOG[4] approval required
VII	Inoculating animals with nucleic acids and peptides/proteins	Live virus	Receiving & Handling	- Can be handled in **ABSL1** or **ABSL2** based on proposed research	- IBC approval required for use of all transgenic animals
VIII	Specimen[1] obtained from SARS-CoV-2 infected animals	Non-inactivated	Receiving & Handling	- Can only be received & handled in a **ABSL3** facility	- IBC and HCLOG[4] approval required
			Isolation of virus	- Can only be done in a **ABSL3** facility	- IBC and HCLOG[4] approval required
		Inactivated[2]	Receiving & Handling	- Same as I – Inactivated Receiving & Handling	- Contact IBC@uci.edu
	Other Materials				
IX	Extracted nucleic acids, proteins		Receiving & Handling	- Can be received and handled on a benchtop - Containment level - **BSL1**	- IBC approval **NOT** required
X	Expressing SARS-CoV-2 proteins		Handling	- If laboratory strain of *E. coli* or mammalian expression vectors that can be handled at **BSL1** are used, protein expression can be done on a benchtop - Containment level - **BSL1** - *If expressing more than two-third of viral genome, IBC will determine the containment level*	- IBC approval required
XI	Environmental samples	Non-inactivated	Receiving & Handling	- Open secondary container inside a certified Biosafety cabinet - Samples can only be handled inside BSC prior to inactivation[2] - In some cases, based on the type of samples, two step inactivation may be necessary - Containment level - **BSL2**	
		Inactivated[2]	Receiving & Handling	- Same as I – Inactivated Receiving & Handling	- Contact IBC@uci.edu

[1]Specimens are defined as, but not limited to, blood, blood products including serum, plasma, swabs or washes/secretions, tissues, feces, urine and others
[2]UCI IBC and UCI Task Force approved Inactivation methods:
- **Heat inactivation:** 56°C for 30 minutes
- **DNA/RNA shield**: Zymo Research
- **TRIzol® LS Reagent**: 1:4 ratio mix, incubate at room temperature for 10 minutes
- **Formalin/Paraformaldehyde fixed**

[3]Unless otherwise indicated, PPE including lab coat, disposable gloves and safety glasses must be worn while handling samples
[4] High Containment Laboratory Oversight Group

Shipment of materials: Contact Anju Subba, UCI Biosafety Officer asubba@uci.edu for more information

User agreement (MTA, EUSLA) requiring Biosafety Officer's signature: Contact Anju Subba, UCI Biosafety Officer asubba@uci.edu

Research review requirements:
- All proposed research with SARS-CoV-2 (COVID-19) requires review by the UCI Institutional Biosafety Committee (IBC). All research requiring A/BSL3 containment needs additional review and approval by High Containment Laboratory Oversight Group (HCLOG).