

Export-Controlled Viruses, Bacteria, Toxins, and Fungi
(Export Control Classification Numbers 1C351, 1C353, and 1C354)

An export license is required for all materials listed, regardless of quantity or attenuation, including small quantities or attenuated strains of select biological agents or “toxins” that are excluded from the lists of select biological agent or “toxins” by APHIS or the CDC, and including “genetic elements”* associated with pathogenicity.

***“Genetic elements” include chromosomes, genomes, plasmids, transposons, vectors, and inactivated organisms containing recoverable nucleic acid fragments, whether genetically modified or unmodified, or chemically synthesized in whole or in part.**

ECCN 1C351 Note: Biological agents and pathogens are controlled under ECCN 1C351 when they are an isolated live culture of a pathogen agent, or a preparation of a toxin agent that has been isolated or extracted from any source or material, including living material that has been deliberately inoculated or contaminated with the agent. Isolated live cultures of a pathogen agent include live cultures in dormant form or in dried preparations, whether the agent is natural, enhanced or modified.

Viruses

An export license is required for all viruses listed, as well as for any genetically modified organism that contains, or any genetic element that codes for, any gene or genes specific to the viruses listed below (ECCN 1C353).

Viruses identified on the Australia Group “List of Human and Animal Pathogens and Toxins for Export Control” (ECCN 1C351.a)	
African horse sickness virus	Monkeypox virus
African swine fever virus	Murray Valley encephalitis virus
Andes virus	Newcastle disease virus
Avian influenza (AI) having high pathogenicity <ul style="list-style-type: none"> • IVPI in 6-week-old chickens greater than 1.2; or • cause at least 75% mortality in 4- to 8-week-old chickens infected IV 	Nipah virus
Bluetongue virus	Omsk hemorrhagic fever virus
Chapare virus	Oropouce virus
Chikungunya virus	Peste-des-petits ruminants virus
Choclo virus	Porcine Teschovirus
Classical swine fever virus (Hog cholera virus)	Powassan virus
Crimean-Congo hemorrhagic fever virus	Rabies virus and all other members of the Lyssavirus genus
Dobrava-Belgrade virus	Reconstructed 1918 influenza virus (includes reconstructed replication competent forms of the 1918 pandemic influenza virus containing any portion of the coding regions of all 8 gene segments)
Easter equine encephalitis virus	Rift Valley fever virus

Ebolavirus (includes all members of the Ebolavirus genus)	Rinderpest virus
Foot-and-mouth disease virus	Rocio virus
Goatpox virus	Sabia virus
Guanarito virus	Seoul virus
Hantaan virus	Severe acute respiratory syndrome (SARS)-related coronavirus (does not include SARS-CoV-2)
Hendra virus (Equine morbillivirus)	Sheeppox virus
Japanese encephalitis virus	Sin Nombre virus
Junin virus	St. Louis encephalitis virus
Kyasanur Forest disease virus	Suid herpesvirus 1 (Pseudorabies virus; Aujeszky's disease)
Laguna Negra virus	Swine vesicular disease virus
Lassa virus	Tick-borne encephalitis virus (Far Eastern Subtype, formerly known as Russian Spring-Summer encephalitis virus) –1C35b: Siberian subtype, formerly Western Siberian virus, is identified on the APHIS/CDC “select agents” list
Louping ill virus	Variola virus
Lujo virus	Venezuelan equine encephalitis virus
Lumpy skin disease virus	Vesicular stomatitis virus
Lymphocytic choriomeningitis virus	Western equine encephalitis virus
Machupo virus	Yellow fever virus
Marburgvirus (includes all members of the Marburgvirus genus)	
Middle-East respiratory syndrome (MERS)-related coronavirus	
Plant viruses (ECCN 1C354.c)	
Andean potato latent virus (Potato Andean latent tymovirus)	Potato spindle tuber viroid

Bacteria

An export license is for all bacteria listed, as well as for any genetically modified organism that contains, or any genetic element that codes for any gene or genes specific to any bacterium listed which: (ECCN 1C353)

- *In itself or through its transcribed or translated products represents a significant hazard to human, animal or plant health; or*
- *Could endow or enhance pathogenicity*

Bacteria identified on the Australia Group “List of Human and Animal Pathogens and Toxins for Export Control” (ECCN 1C351.c)	
Bacillus anthracis	Clostridium perfringens, epsilon toxin producing types
Brucella abortus	Coxiella burnetii
Brucella melitensis	Francisella tularensis
Brucella suis	Mycoplasma capricolum subspecies capripneumoniae (“strain F38”)

Burkholderia mallei (Pseudomonas mallei)	Mycoplasma mycoides subspecies mycoides SC (small colony) (aka contagious bovine pleuropneumonia)
Burkholderia pseudomallei (Pseudomonas pseudomallei)	Rickettsia prowazekii
Chlamydia psittaci (Chlamydophila psittaci)	Salmonella enterica subspecies enterica serovar Typhi (Salmonella typhi)
Clostridium argentinense (formerly known as Clostridium botulinum Type G), botulinum neurotoxin producing strains	Shiga toxin producing E coli (STEC) of serogroups O26, O45, O103, O104, O111, O121, O145, O157, and other shiga toxin producing serogroups (includes enterohaemorrhagic E. coli (EHEC), verotoxin producing E. coli (VTEC), or verocytotoxin producing E. coli (VTEC))
Clostridium baratii, botulinum neurotoxin producing strains	Shigella dysenteriae
Clostridium botulinum	Vibrio cholerae
Clostridium butyricum, botulinum neurotoxin producing strains	Yersinia pestis
Plant Bacteria (ECCN 1C354.a)	
Xanthomonas albilineans	Clavibacter michiganensis subspecies sepedonicus (syn. Corynebacterium michiganensis subspecies sepedonicum or Corynebacterium sepedonicum)
Xanthomonas axonopdis pv. Citri (Xanthomonas campestris pv. Citri A) (Xanthomonas campestris pv. citri)	Ralstonia solanacearum, race 3, biovar 2
Xanthomonas oryzae	Raythayibactor toxicus

Toxins

An export license is required for all toxins listed, as well as for any genetically modified organism that contains, or any genetic element that codes for, any listed toxins or their subunits (ECCN 1C353).

“Toxins” identified on the Australia Group “List of Human and Animal Pathogens and Toxins for Export Control” and “subunits” thereof (ECCN 1C351.d)	
Abrin	Nodularins
Aflatoxins	Palytoxin
Botulinum toxins (does not include medical products)	Ricin
Brevetoxins	Saxitoxin
Clostridium Perfringens alpha, beta 1, beta 2, epsilon and iota toxins	Shiga toxins (shiga-like toxins, verotoxins, and verocytotoxins)
Conotoxins (does not include medical products)	Staphylococcus aureus enterotoxins, hemolysin alpha toxin, and toxic shock syndrome toxin (formerly known as Staphylococcus enterotoxin F)
Diacetoxyscirpenol	T-2 toxin
Gonyautoxins	Tetrodotoxin
HT-2 toxin	Viscumin (Viscum album lectin 1)
Microcystins (Cyanginosins)	Volkensin
Modeccin	

Fungi

An export license is required for all fungi listed, as well as for any genetically modified organism that contains, or any genetic element that codes for any gene or genes specific to any fungus listed (ECCN 1C353).

Fungi (ECCN 1C351.e)	
Coccidioides immitis	Coccidioides posadasii
Plant Fungi (ECCN 1C354.b)	
<i>Bipolariz oryzae</i> (<i>Cochliobolus miyabeanus</i> , <i>Helminthosporium oryzae</i>)	<i>Peronosclerospora philippinensis</i> (<i>Peronosclerospora sacchari</i>)
<i>Colletotrichum kahawae</i> (<i>Colletotrichum coffeanum</i> var. <i>virulans</i>)	<i>Sclerophthora rayssiae</i> var. <i>zeae</i>
<i>Pseudocercospora ulei</i> (<i>Microcyclus ulei</i> , <i>Dothidella ulei</i>)	<i>Synchytrium endobioticum</i>
<i>Puccinia graminis</i> ssp. <i>graminis</i> var. <i>graminis</i> / <i>Puccinia graminis</i> ssp. <i>graminis</i> var. <i>stakmanii</i> (<i>Puccinia graminis</i> [syn. <i>Puccinia graminis</i> f. sp. <i>tritici</i>])	<i>Tilletia indica</i>
<i>Puccinia striiformis</i> (syn. <i>Puccinia glumarum</i>)	<i>Thecaphora solani</i>
<i>Magnaporthe oryzae</i> (<i>Pyricularia oryzae</i>)	<i>Phoma glycinicola</i>

Vaccines, immunotoxins, medical products, diagnostic and food testing kits (ECCN 1C991)

Most 1C991 materials will not require an export license. For materials listed below, an export license may be required for certain countries, including countries Penn frequently ships to (e.g., China, Israel, Saudi Arabia, Taiwan, the UAE, etc.).

Medical products that contain any of the following
Toxins or their subunits listed in this document (does not apply to botulinum toxins or conotoxins)
Genetically modified organisms or genetic elements Genetic elements that code for any toxins or their subunits listed (does not apply to botulinum toxins or conotoxins)

If you believe that your material may require an export license, please contact expctrl@lists.upenn.edu.