DEPARTMENT OF BIOLOGY
INDIANA UNIVERSITY
College of Arts and Sciences
Bloomington

October 27, 2025

David Duncan, Of Counsel
Zalkind Duncan & Bernstein LLP
2 Oliver Street, Suite 200
Boston, MA 02109

Re: U.S. v. Yunqing Jian

Dear Mr. Duncan,

Per your request, I have evaluated the documents pertaining to the above case that you sent to me on October 23, 2025. These documents included the transcripts from the interview of Dr. Zunyoung Liu by U.S. Customs on 7/27/24, the Criminal Complaint and Affidavit in U.S. v. Jian, the National Bioforensic Analysis Center Report on the analysis of the items seized from Liu on 07/27/24, and scientific publications authored by Dr. Yunqing Jian and Dr. Liu, which provide scientific context for the research project that was being pursued by Dr. Liu.

I am qualified to provide expert insight into this case as I direct a research laboratory at Indiana University in Bloomington that focuses on the molecular mechanisms that mediate plant-microbe interactions. I have worked in this field since 1983, thus have over 40 years of experience. My expertise was recently recognized by my election to the National Academy of Sciences of the U.S.A. Furthermore, one of the topics we study is the interaction between the fungus *Fusarium graminearum* and the host plant wheat, which happens to be the system that was being investigated by Dr. Liu. We recently published a paper on this topic in the journal *Molecular Plant-Microbe Interactions* (*https://doi.org/10.1094/MPMI-08-24-0103-FI*).

You asked me to assess whether the fungal strains that were discovered by Customs Agents in Dr. Liu's backpack were likely to pose a risk to U.S. Agriculture, and also, why Dr. Liu may have been attempting to smuggle these strains into the U.S.A. Based on the transcripts from the Customs interview and the report of the Bioforensic Analysis center, it is clear to me that these strains were being brought to the U.S.A. to enable Dr. Liu to view these fungal strains under a specialized fluorescence microsope at the University of Michigan, which he had previously used while a postdoctoral research scientist in the laboratory of Libo Shan and Ping He. The purpose of this research was to develop better methods for protecting wheat from infection by the fungus *Fusarium graminearum.* This fungus typically infects the flowers of wheat plants during pollination, leading to a disease called Fusarium Head Blight, or FHB for short. FHB causes accumulation of fungal toxins that make livestock and humans vomit. The level of such fungal toxins in wheat is strictly regulated; thus, farmers spend large amounts of money on fungicides to prevent such infections. Dr. Liu's research is aimed at reducing this cost to farmers.

Based on the Customs transcript and the Bioforensic report, the strain that Dr. Liu was studying was a standard laboratory strain known as PH-1. The entire genome of this strain has

been sequenced, which is why it is the strain of choice for most molecular biology labs that study FHB. Indeed, we work with this strain in my own laboratory. Notably, this strain was originally collected from a grain elevator in Michigan in 1996, thus represents a strain that is native to Michigan. It has since been distributed to laboratories around the world for detailed studies, including labs in China, Europe, and the United Kingdom. It is also important to understand that this fungal species is ubiquitous in Michigan, which is why farmers spend so much money trying to control it. It is thus extremely unlikely that accidental escape of the strains carried by Dr. Liu would have had any detrimental effect on U.S. farmers.

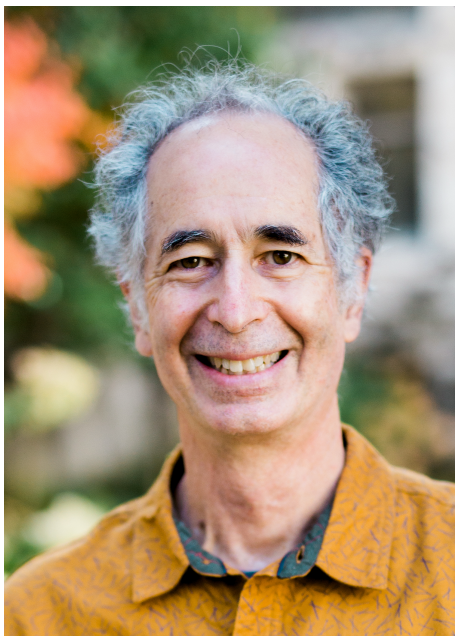
I will also note that the specific strains carried by Dr. Liu had been modified at the DNA level to knockout an endogenous gene called *ARP9*, which was then replaced by a different version of *ARP9* that had been fused to a protein called GFP (for Green Fluorescent Protein). The fusion of GFP onto endogenous proteins enables molecular biologists to detect the location of the protein inside of a cell using fluorescence microscopy. It thus becomes clear that Dr. Liu was returning to Professor Shan and He's laboratory to use their fluorescence microscope to localize the ARP9 protein inside of fungal cells. When one makes such GFP fusions, though, it often compromises the function of the protein to which GFP is fused. In this case, one might expect that ARP9 function would be compromised. If it was, then the strains carried by Liu would be less virulent than a wild-type strain, thus pose even less risk. In addition, as part of the process of replacing the endogenous ARP9 gene with the ARP9:GFP gene, the strain carried bacterial genes that conferred resistance to antibiotics (hygromycin and neomycin). These genes would also be expected to reduce virulence rather than enhance virulence.

Related to the process of replacing the *ARP9* gene, Dr. Liu also brought with him DNA that encoded the *ARP9* gene fused to GFP. This DNA was likely the same DNA that was used to create the four strains that were in his backpack. Most likely, he brought these DNAs with him as a back-up. If the fungal strains that he had generated died in transit, or failed to express the ARP9:GFP fusion protein for some other reason, then he could remake the fungal strains while in Michigan using this DNA. The DNA, however, poses no risk, nor does its use pose any risk.

In summary, Dr. Liu violated U.S. laws regarding the import of genetically modified organisms by not obtaining a permit from the USDA APHIS. This justified his immediate deportation to China. However, the presence of these fungal strains in his luggage posed no risk to U.S. farmers, or anyone else, and his intent with these strains was to conduct research that would help wheat farmers globally to combat this fungal disease. Based on the evidence, there was no intent to generate a more virulent strain.

Sincerely,

Roger Innes
Distinguished Professor
Class of 1954 Professor of Biology



Distinguished Professor Roger Innes

Roger Innes holds the Class of 1954 Professorship in Biology at Indiana University-Bloomington. He received his Ph.D. in Molecular, Cellular and Developmental Biology at the University of Colorado-Boulder, and completed Post-doctoral research at the University of California-Berkeley where he helped develop Arabidopsis as a model system for studying molecular plant-microbe interactions. He is an elected fellow of the National Academy of Sciences, the American Association for the Advancement of Science and the American Academy of Microbiology, and is the immediate Past President of the International Society of Molecular Plant-Microbe Interactions. His current research focuses on molecular mechanisms underlying the plant immune system and development of novel strategies for engineering disease resistant crops. Over the course of his career, Dr. Innes has contributed to several seminal discoveries in plant-microbe interactions. These include the discovery that legumes secrete specific chemicals from their roots that induce expression of nodulation genes in Rhizobium (nitrogen-fixing bacteria), the identification of proteins secreted by bacterial pagthogens that are recognized by plant disease resistance (R) proteins, the identification and cloning of the disease resistance genes *RPM1* and *RPS5*, which were among the first such genes cloned from plants, and development of the ‘guard model’ for R protein function, whereby R proteins sense modifications of host proteins targeted by pathogens. Most recently, his group has shown that plants secrete RNA in response to pathogen infection, with the surprising discovery that plant leaves are coated by RNA, which is likely to impact the microbes that colonize leaf surfaces.