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AFFIDAVIT IN SUPPORT OF A CRIMINAL COMPLAINT

I, Matthew S. Seckers, being duly sworn and deposed, state the following:

1. I am a Special Agent with the Federal Bureau of Investigation (FBI) and have been so employed since June 2009. As part of my duties, I conduct national security investigations related to counterintelligence and counterproliferation. I have also participated in the execution of numerous search warrants and arrests for a variety of criminal and national security investigations.

2. I respectfully submit this affidavit in support of a criminal complaint for Yiheng Percival Zhang AKA Y.H. Percival Zhang (P. Zhang) for violations of 18 U.S.C. § 371 (conspiracy to commit offense or to defraud the United States) which requires that "two or more persons conspire either to commit any offense against the United States, or to defraud the United States, or any agency thereof in any manner or for any purpose, and one or more of such persons do any act to effect the object of the conspiracy." Between at least January 2014 and May 2016, P. Zhang and two other identified individuals, Zhiguang Zhu (Zhu) and Chun You (You), violated 18 U.S.C. § 371 in conjunction with activities related to violations of 18 U.S.C. § 1343 (wire fraud), 18 U.S.C. § 287 (criminal false claims), and 18 U.S.C. § 1001 (false statements).

3. The statements in this affidavit are based on my personal knowledge and information obtained from the National Science Foundation (NSF) Office of Inspector General (OIG), the U.S. Department of Energy (DOE) OIG, the United States Citizenship and Immigration Services (USCIS), other FBI investigations, as well as information received from persons with knowledge regarding relevant facts, and from personal review of records and documents. Since this affidavit is being submitted for the limited purpose of obtaining an arrest warrant, I have not set forth every fact resulting from the investigation. I have set forth only those

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facts necessary to establish probable cause to believe three individuals, P. Zhang, Zhu, and You conspired to and did in fact cause false statements and certifications to be submitted to NSF and DOE in violation of 18 U.S.C. § 1001; conspired to and did in fact submit false claims to NSF in violation of 18 U.S.C. § 287 (criminal false claims); and, conspired to and engaged in a scheme to defraud NSF, in violation of 18 U.S.C. § 1343 (wire fraud), all in violation of 18 U.S.C. § 371 (conspiracy). Based upon investigation conducted to date, I have probable cause to believe that P. Zhang directed the actions leading to the conspiracy and therefore is the subject of this criminal complaint.

Background Information on the Subjects

4. P. Zhang is currently a Professor in the Department of Biological Systems Engineering at Virginia Tech. He is the Founder and Chief Scientific Officer (CSO) of CFB and was also the Founder and CSO of the now-dissolved Gate Fuels, Inc. (GFI). As of January 21, 2016, P. Zhang was listed as a Principal Investigator (PI) at the Tianjin Institute of Industrial Biotechnology (TIIB) in China on a TIIB website. P. Zhang appears to maintain an affiliation with TIIB, as indicated on a website for the 7th International Forum on Industrial Bioprocessing, May 21-24, 2017, in Wuxi, China, which listed “Prof. Yiheng Percival Zhang, Tianjin Institute of Industrial Biotechnology” as a speaker. A publicly-available speaker profile for P. Zhang on the University of California, Riverside website in reference to a November 20, 2015 seminar stated P. Zhang was “an affiliated researcher of Chinese Academy of Sciences – Tianjin Institute of Industrial Biotechnology (China)” and founded “three Chinese start-up companies.”

5. According to P. Zhang’s Biographical Sketch provided to NSF and DOE, P. Zhang received Bachelor’s and Master’s degrees in Biochemical Engineering from the East China University of Science and Technology in 1993 and 1996, respectively, and a Ph.D. in Chemical

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& Biochemical Engineering from Dartmouth College (Dartmouth) in 2002.

6. According to immigration records obtained by NSF-OIG from USCIS: P. Zhang was born in Wuhan, China on [REDACTED]; he became a naturalized United States citizen on May 13, 2011; and, he has been employed by Virginia Tech since approximately August 2005 and held a postdoctoral appointment at Dartmouth from approximately June 2002-August 2005.

7. Zhu is currently an Investigator at TIIB as listed on a TIIB website. According to his LinkedIn profile as of September 11, 2017, Zhu was PI and Chief Technology Officer at CFB from July 2013-June 2016; a Research Assistant at Virginia Tech from August 2009-May 2013, and August 2007-May 2009; a Master's student at Virginia Tech from 2007-2009; and, a Ph.D. student at Virginia Tech from 2009-2013.

8. According to Zhu's Biographical Sketch provided to both NSF and DOE, Zhu received a Bachelor's degree in Biotechnology from Huazhong University of Science & Technology in China in 2007, and a Master's degree and a Ph.D. in Biological Systems Engineering from Virginia Tech in 2009 and 2013, respectively. Zhu's Biographical Sketch also listed P. Zhang as Zhu's Ph.D. advisor.

9. According to information obtained from USCIS, Zhu has had lawful permanent resident (LPR) status in the United States since 2014. Prior to his LPR status, Zhu held nonimmigrant student status with permission to work under the Optional Practical Training Program.

10. You is currently an Investigator at TIIB as listed on a TIIB website. According to his LinkedIn profile as of September 11, 2017, You was Chief Scientist at CFB from April 2013-March 2016; a Senior Research Associate at Virginia Tech from April 2012-March 2016; and, a

Postdoc at Virginia Tech from April 2010-April 2012.

11. According to You's Biographical Sketch provided to NSF, You received a Bachelor's degree in Life Science and a Ph.D. in Genetics from Fudan University in China in 2003 and 2009, respectively, and was a Research Assistant at TIIB from September 2009-April 2010. You's Biographical Sketch also listed P. Zhang as You's postdoctoral advisor.

12. According to information obtained from USCIS, You has had LPR status in the United States since 2015. Prior to his LPR status, You initially entered the United States with nonimmigrant J-1 status and changed from J-1 to H1-B status in 2014.

Background on the Subject's Company

13. P. Zhang previously owned a technology startup company named GFI that was incorporated on or about August 31, 2010, with affiliated addresses at 3107 Alice Drive, Blacksburg, Virginia, 411 and 418 Latham Hall, Blacksburg, Virginia, and 2200 Kraft Drive, Suite 1200B, Blacksburg, Virginia.

14. According to NSF proposal IIP-1346312, GFI focused on "developing microbial technology that enables sustainable production of biofuels and biomaterials using a group of organisms including the species *Bacillus subtilis* and the genus *Geobacillus*."

15. GFI was later dissolved and P. Zhang transformed GFI into another company named CFB. On or about July 17, 2013, P. Zhang wrote to NSF Program Officer Prakash Balan (Balan) from email address ypzhang@vt.edu: "As the PI of the NSF Phase I award (IIP-1214895), I am writing this letter to request the approval of transferring all rights including the relevant intellectual property from Gate Fuels Inc. pertaining to cell-free biosystems to Cell-Free Bioinnovations Inc. (CFB9) and to issue CFB9 with all rights to submit the NSF SBIR II

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proposal.” In applications to NSF and DOE, CFB represented it rented space at 1800 Kraft Drive, Suite 222, Blacksburg, Virginia from Virginia Tech’s Corporate Research Center. In NSF and DOE proposal and award documents, CFB is also affiliated with addresses at 418 Latham Hall, Blacksburg, Virginia and 2200 Kraft Drive, Suite 1200B, Blacksburg, Virginia.

16. To fund CFB’s research, the company leveraged the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) funding programs managed by NSF and DOE. The SBIR program was established by Congress in 1982 to provide increased opportunities for small businesses to participate in research and development to increase employment, and to improve competitiveness in the United States. The intended purpose of the SBIR program is to encourage small businesses to engage in federal Research and Development (R&D) projects that have potential for commercialization. The STTR program was established by the Small Business Technology Transfer Act of 1992. Government agencies with R&D budgets of \$1 billion or more are required to set aside a percentage of these funds to finance the STTR activity. The goal of the STTR program is to facilitate the transfer of technology developed by a research institution through the entrepreneurship of a small business.

17. The primary difference between the SBIR and STTR programs is that the STTR program requires a team approach, in which the small business must partner with a collaborating research institution (CRI), such as a university. The CRI must receive a minimum of 30 percent of the award funds and perform a minimum of 30 percent of the research.

18. At NSF and DOE, SBIR/STTR awards are divided into two phases. Phase I is a feasibility study to determine suitability of further research with regard to a particular topic. It generally lasts six months to twelve months and is funded with an amount between \$70,000 and \$225,000, depending on the awarding agency. Phase II consists of expansion and development of

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the technology investigated in Phase I, typically lasts two years, and is funded with an amount between \$300,000 and \$1 million, depending on the awarding agency. An individual company must have submitted a successful final report upon conclusion of Phase I to be eligible to receive a Phase II award.

19. NSF requires that all SBIR/STTR proposals, interim, and final reports generally be filed and submitted electronically through NSF's electronic submission system known as "FastLane." At all times relevant to this affidavit, the FastLane computer server was physically located in Virginia. For future paragraphs of this affidavit that reference the submission of proposals, interim reports, and final reports to NSF, please note that all such submissions were generally made electronically through NSF's FastLane System, as mandated.

20. During the relevant timeframe, proposals to DOE were electronically submitted through an electronic system called Grants.gov, which serves as a portal for grant proposals to DOE. At all times relevant to this affidavit, the computer servers for Grants.gov were physically located in Virginia.

21. NSF personnel have official email addresses ending with the domain name of "@nsf.gov." At all relevant times, NSF email addresses were hosted by an NSF email server located in the Microsoft Office 365 Cloud. For all future paragraphs of this affidavit that reflect email correspondence sent to or from NSF program personnel, please note that all such e-mails sent to or by personnel at NSF were sent through an email server located in the Microsoft Office 365 Cloud.

22. Generally, the federal government issues payments under the SBIR/STTR programs via electronic transfer. For example, NSF electronically requests payment through the

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Department of Treasury's Financial Management Service (FMS), located in Kansas City, Missouri. FMS then authorizes payment through a Federal Reserve Bank, and the money is transferred from the Federal Reserve Bank to the awardee's bank account. DOE utilizes the Automated Standard Application for Payments (ASAP) system to allow for quick and secure disbursements to awardees. The Department of Treasury provides this service to federal agencies and their awardees. Federal agencies enroll awardees in ASAP, authorize payments, and manage awardees' accounts. Once an awardee is enrolled in ASAP, it requests payments from pre-authorized accounts. At all times relevant to this affidavit, federal SBIR/STTR grant award payments were electronically transferred from the associated federal agency, through the Department of Treasury, and then wired to a business bank account identified by the awardee.

23. At NSF, each SBIR/STTR proposal is to be signed, dated, and certified, with the small business representing itself as meeting all eligibility criteria. The small business is to provide true and accurate information about the company throughout the proposal, to include the company's size, personnel, anticipated budget, work plan, commercialization, and outside investment information. NSF relies upon the accuracy of certified proposal submissions to ensure the small business meets the eligibility criteria for the program, and also to evaluate the merits of the proposals.

24. The SBIR/STTR programs allow for a reasonable profit or fee, which generally does not exceed seven percent (7%) of the total award. For example, the NSF SBIR/STTR award conditions allow a maximum profit/fee of seven percent (7%) of the budget in all SBIR/STTR awards as proposed and as approved by NSF.

25. Furthermore, each NSF proposal contains the following certification: "By signing and submitting this proposal, the Authorized Organizational Representative or Individual

Applicant is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application ... Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section 1001)."

26. NSF also requires certified interim and final project reports, stating that the "work for which payment is hereby requested was done in accordance with the award terms and conditions" and that "willful provision of false information or concealing a material fact in this report or any other communication submitted to NSF is a criminal offense."

27. NSF requires Phase I SBIR/STTR grantees to attend mandatory in-person training during the Phase I award period to communicate program mandates in clear terms through written and oral presentations. Records of the NSF SBIR/STTR program show that P. Zhang and Zhu attended the mandatory NSF Phase I SBIR/STTR Grantees Conference in Arlington, Virginia as follows:

Workshop Date	Attendee	Awardee Company
September 26-27, 2012	P. Zhang	GFI
March 10-12, 2014	Zhu	CFB

This conference provided Phase I grantees with information regarding SBIR/STTR program eligibility requirements, and the budgeting and accounting system requirements (including timekeeping) required of NSF SBIR/STTR grantees. The program included a presentation by NSF-OIG discussing the award criteria and associated certifications, and informing Phase I grantees of the criminal and civil consequences of providing false information to NSF in proposals and reports, of misrepresenting eligibility criteria, and of using the grant funds for personal use and expenses not associated with the purpose of the underlying grant.

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28. NSF Phase II submissions must undergo a financial capability review. CFB's Phase II financial capability review was performed by the Cost Analysis and Audit Resolution (CAAR) Branch prior to its Phase II award. This financial capability review included a review of CFB's accounting and timekeeping systems whereby CFB was required to submit a sample timesheet.

29. In order to receive additional, incremental funding under NSF Phase II awards, awardees must provide Milestone Charts reporting project expenditures and the level of effort of the PI and other key personnel with each report submission. At all times relevant to this affidavit, the SBIR/STTR Phase II General Grant Conditions required the reporting of estimated expenditures in Interim Reports and "the actual expenditures for the entire project" in the Final Report. Truthfulness in the reports was and is material to the United States Government. Accordingly, the truth as to representations in the reports is generally required to be certified by the applicant acknowledging he or she understands that it is a crime to provide false information or to omit material information.

Summary of Investigation

30. Per the following chart, since February 19, 2013, CFB received five SBIR/STTR awards with funding received totaling \$1,108,348:

Award Number	Funding Agency	Title	Start Date	Expiration Date	Funding Received	Violation Detail
DE-SC0009659	DOE	Biological CO ₂ Fixation for the Production of Formic Acid Powered by Sugars	February 19, 2013	April 30, 2014	\$150,000	Potential violations not included in current affidavit

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IIP-1321528	NSF	STTR Phase I: High-Yield Hydrogen Production from Biomass Sugars by Cell-Free Biosystems for Mobile Electricity Generation	July 1, 2013	December 31, 2014	\$225,000	Potential violations not included in current affidavit
IIP-1353266	NSF	SBIR Phase II: High-Power and High-Energy-Density Enzymatic Fuel Cell through an In Vitro Synthetic Enzymatic Pathway	April 1, 2014	March 31, 2016	\$584,083	False statements concerning time and effort reporting provided to NSF during required pre-award review (see paragraphs 28 and 45-49) and false Milestone Charts (see paragraphs 29, 50, and 55-65)
DE-SC0013229	DOE	Production of a Zero Calorie Sweetener L-Arabinose from Biomass D-Xylose by an Enzyme Cocktail	February 17, 2015	November 16, 2015	\$149,265	Violated STTR award criteria in paying CRI Virginia Tech less than required minimum 30% of STTR award funds (see paragraphs 17 and 66-73)
IIP-1549018	NSF	STTR Phase I: Low-Cost Biosynthesis of Sugar Phosphates via ATP-Free Enzyme Cocktails	January 1, 2016	December 31, 2016	\$0 (Award suspended and terminated prior to release of any award funds)	Awarded application for work previously completed in China (see paragraphs 33 and 35-43)

31. Virginia Tech received subawards from CFB under DOE awards DE-SC0009659 and DE-SC0013229 and NSF awards IIP-1321528 and IIP-1353266. This subaward work was

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performed at Virginia Tech and, according to a representative of Virginia Tech, P. Zhang supervised the work.

32. A violation of 18 U.S.C. § 371 occurs when “two or more persons conspire...to defraud the United States...in any manner or for any purpose, and one or more of such persons do any act to effect the object of the conspiracy.” Additionally, a violation of 18 U.S.C. § 1343 occurs when a person “having devised or intending to devise any scheme or artifice to defraud, or for obtaining money or property by means of false or fraudulent pretenses, representations, or promises, transmits or causes to be transmitted by means of wire...communication in interstate commerce, any writings...for the purpose of executing such scheme or artifice.” Lastly, a violation of 18 U.S.C. § 287 occurs when an individual “made or presented a false, fictitious, or fraudulent claim to a department of the United States, knew such claim was false, fictitious or fraudulent, and did so with the specific intent to violate the law or with consciousness that what he was doing was wrong.” As set forth below in more detail, I have evidence that P. Zhang, Zhu, and You conspired to submit SBIR/STTR grant requests to the United States Government for work already completed in China. I have additional evidence that an email from P. Zhang demonstrating he directed this scheme, which crossed state lines.

33. On June 11, 2015, P. Zhang, from ypzhang@vt.edu, wrote to Edwin Rogers (Rogers), former CFB Chief Executive Officer and Board Member, and Dr. Daniel Wichelecki (Wichelecki), former CFB Senior Scientist, with You cc'd at yoshion@vt.edu:

“Indeed, nearly all experiments in SBIR I (inositol) have been finished; Dr. You and I have filed a Chinese patent on behalf of ourselves (no relation to CFB). I think that inositol project will be licensed to some Chinese company within a short time...Now we submit this SBIR proposal. If it is funded, most of SBIR I will be used for CFB to

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support the other projects... About sugar phosphate project, the experiments have been conducted by one of my collaborators and my satellite lab in China. The technology transfer will occur in China only. If this project is funded by STTR, most of money will be used to fund the other project [sic] in CFB, too."

34. Inositol-specific SBIR proposals were submitted by CFB to NSF on the following dates, with the following PIs and dispositions:

Unfunded Proposal Number	PI	Submission Date	Authorized Organizational Representative (AOR)	Disposition
IIP-1548342	You	June 14, 2015	You	Withdrawn
IIP-1548815	You	June 16, 2015	You	Declined
IIP-1621085	Katie Whalen	December 7, 2015	Zhu	Withdrawn

In each of the electronic submissions above, which constitute attempts to secure additional federal awards, CFB sought NSF funding for work which had already been completed. Based on his June 11, 2015 email, it appears P. Zhang sought to benefit a Chinese company through the inositol technology.

35. P. Zhang wrote sugar phosphate-specific NSF proposal IIP-1549018, a CFB application for which the work had already been completed in China. Based on his June 11, 2015 email, it appears P. Zhang also sought to benefit China through the sugar phosphate technology. On May 2, 2015, from email account ypzhang@vt.edu, P. Zhang wrote to Wichelecki an email entitled, "First draft proposal of sugar phosphates" with a document entitled, "Project Description v1.0.docx" attached, which demonstrates his authorship of the proposal.

36. From ypzhang@vt.edu, P. Zhang wrote to Wichelecki on May 18, 2015, concerning the NSF sugar phosphate project:

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“What we expect here is to get this free money and use a half of money [sic] to do what you want to do – make sweeteners. Another half will be used to pay VT graduate students to finish this project.”

37. On June 5, 2015, from ypzhang@vt.edu, P. Zhang wrote to Wichelecki with Zhu cc'd at zhustar@vt.edu, “I try [sic] to submit your [sugar phosphate] proposal to NSF fast lane. But I messed up the password. Can you help reset it up and send it to me?” Wichelecki responded the same day to ypzhang@vt.edu with zhustar@vt.edu cc'd, “I reset everything, but kept the password the same. You should be able to login now.” P. Zhang subsequently responded the same day from ypzhang@vt.edu, “Dan, Thanks. I am getting in now.”

38. On June 16, 2015, Wichelecki exchanged emails with P. Zhang and Zhu about the submission of sugar phosphate-specific NSF proposal IIP-1549018.

39. Specifically, Wichelecki wrote to P. Zhang at ypzhang@vt.edu:

“Also, for submission [of the sugar phosphate NSF proposal], is everything on fastlane up-to-date or do I need to reupload [sic] all the files from this version, if so can you send the segments separately?”

P. Zhang responded from ypzhang@vt.edu, “Enclose this one. If you check everything well, we can let Zhiguang to submit the proposal.” P. Zhang attached the document “\$ entire proposal.pdf” to his email. Zhu subsequently responded from zzhu@cfb9.com, “Yes. I can do that. But I may still need all the updated documents just in case something has been changed online.” Next, Wichelecki replied to Zhu:

“I [sic] looks like all of the documents were updated on FastLane so it should be good to go. I just click "Submit STTR" on the Proposal Actions page, right? Let me know if that is all that is needed for submission and I'll get it done.”

Zhu subsequently responded to Wichelecki, "If you have checked everything and they are all good to go, you can submit it. Yes, just click submit STTR button."

40. Sugar phosphate-specific NSF proposal IIP-1549018 was submitted June 16, 2015. P. Zhang's email address ypzhang@vt.edu is listed on the proposal Cover Page, in P. Zhang's Biographical Sketch, and in a Letter of Support provided by P. Zhang, who was the proposed Co-PI via a subcontract to Virginia Tech. Zhu signed proposal IIP-1549018 as the AOR.

41. In a September 17, 2015 email from Wichelecki to Rogers with P. Zhang cc'd at ypzhang@vt.edu, Wichelecki wrote with respect to sugar phosphate-specific NSF proposal IIP-1549018, "... I did not primarily write the grant (I was still at [the University of Illinois at Urbana-Champaign] and just edited it)..."

42. P. Zhang used the Virginia Tech email service, which is hosted by Google. Balan, who communicated with P. Zhang, provided NSF-OIG email correspondence he had with P. Zhang in which P. Zhang used the ypzhang@vt.edu address. NSF-OIG searched the IP addresses contained in the metadata of three emails sent to Balan from ypzhang@vt.edu from 2014-2016 using the publicly-available WHOIS IP Lookup Tool. It appeared each of P. Zhang's emails involved IP addresses located in different states. Thus, I have probable cause to believe P. Zhang's June 11, 2015 email crossed state lines.

43. The sugar phosphate and inositol proposals were all electronically submitted to NSF for the purpose of receiving federal funding. P. Zhang wrote and directed Zhu to submit the sugar phosphate proposal knowing the work had already been completed in China; Zhu certified this proposal as AOR. Additionally, You and Zhu certified the inositol proposals as AOR, with at least You knowing the work had already been completed. Based on P. Zhang's June 11, 2015

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email and the subsequent submissions of the sugar phosphate and inositol grant applications to NSF, I have probable cause to believe that P. Zhang, Zhu, and You conspired to defraud NSF of award funds for work that had already been completed.

Additional Examples of Fraud and False Claims

44. A violation of 18 U.S.C. § 1343 occurs when a person “having devised or intending to devise any scheme or artifice to defraud, or for obtaining money or property by means of false or fraudulent pretenses, representations, or promises, transmits or causes to be transmitted by means of wire...communication in interstate commerce, any writings...for the purpose of executing such scheme or artifice.” A violation of 18 U.S.C. § 1001 occurs when a person “makes or uses any false writing or document knowing the same to contain any materially false, fictitious, or fraudulent statement or entry.” A violation of 18 U.S.C. § 287 occurs when a person “makes or presents...to any department or agency [of the United States], any claim upon or against the United States, or any department or agency thereof, knowing such claim to be false, fictitious, or fraudulent.” Additionally, a violation of 18 U.S.C. § 371 occurs when “two or more persons conspire...to defraud the United States...in any manner or for any purpose, and one or more of such persons do any act to effect the object of the conspiracy.” As set forth below, I have evidence that P. Zhang and Zhu participated in conduct that satisfies the elements of one or more of these crimes with respect to NSF award IIP-1353266 and DOE award DE-SC0013229.

45. As a part of its CAAR review for NSF Phase II award IIP-1353266, CFB was required to submit a Financial Management Systems Questionnaire (FMSQ) and a sample timesheet to NSF. The FMSQ was signed by Zhu and appears to have been dated January 2, 2014. In the FMSQ, CFB claimed it had appropriate accounting and timekeeping systems.

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Adequate accounting and timekeeping systems are material to the decision to fund NSF SBIR Phase II awards. The sample timesheet provided by CFB appeared to show Zhu's hours for November 2013. The timesheet was divided into two pages: one for November 1-15, 2013, and the other for November 16-30, 2013. The timesheet listed projects "NSF-IIP-1321528" and "DE-SC0009659" but only recorded hours for "DE-SC0009659." The timesheets appear to have been signed by Zhu on November 16, 2013, and December 1, 2013, and by P. Zhang on November 22, 2013, and December 1, 2013.

46. NSF relied upon the representations CFB made about its timekeeping systems in the CAAR review for NSF award IIP-1353266. Specifically, the independent certified public accountants who reviewed CFB's FMSQ and sample timesheet reported back to NSF, "The company's sample timesheet...is adequate for documenting effort expended by its employees on various activities and related charges."

47. NSF-OIG issued subpoenas to CFB seeking general ledgers, time and effort reports, and timesheets, among other documentation. P. Zhang provided responses to the subpoenas, which NSF-OIG received on August 16, 2016 and November 15, 2016. In response to the subpoenas, P. Zhang provided two timesheet documents to NSF-OIG on November 15, 2016, via ypzhang@vt.edu: "0 timesheet-CFB 2013-2016-1.pdf" and "0 timesheet-CFB 2013-2016-2.pdf". The timesheets provided by P. Zhang in response to the subpoenas did not match the timesheet provided to NSF during the CAAR review for NSF Phase II award IIP-1353266. Specifically, timesheets provided by P. Zhang in response to the subpoenas were quarterly and did not specify which projects employees worked on.

48. Zhu's October-December 2013 quarterly timesheet provided by P. Zhang in response to the subpoenas did not match his November 2013 timesheet provided to CAAR.

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Zhu's quarterly timesheet provided by P. Zhang in response to the subpoenas listed no hours on November 11, 26, and 27, 2013, while his timesheet provided to CAAR listed eight hours for "DE-SC0009659" on each of those three days. The quarterly timesheet appears to have been signed by Zhu and P. Zhang and dated January 2, 2014. NSF-OIG followed up with P. Zhang on November 23, 2016, asking if he had additional timesheets, like the timesheet provided to CAAR, which track employee time and effort by project. P. Zhang responded the same day from ypzhang@vt.edu:

"We do not have such documents. Because we are a small company and scientists have no accounting background, we do not prepare such documents like big companies."

49. Thus, CFB obtained NSF award IIP-1353266 based, in part, upon fraudulent representations about its time and effort reporting system.

50. NSF award IIP-1353266 (AKA "bio-battery project") was effective April 1, 2014-March 31, 2016. Interim Reports were submitted electronically to NSF on September 11, 2014, May 14, 2015, and November 3, 2015, and the Final Report was submitted electronically to NSF on May 30, 2016. The three Interim Report submissions resulted in additional payments to CFB based upon CFB's certifications. The Interim and Final Reports all included Milestone Charts, as required.

51. In each of the reports listed above, CFB was required to fill out certifications in order for the report to be approved for additional payments. Two certifications included "The work for which payment is hereby requested was performed in accordance with the award terms and conditions and that payment is due and has not been previously requested" and "All of the funds committed to this award, including all associated supplemental awards, have been fully expended as designated in the grant budget." CFB selected "Yes" in response to both questions

for its Interim Reports and Final Report for NSF award IIP-1353266.

52. Zhu signed the certifications for NSF award IIP-1353266 as both Authorized Company Officer (ACO) and PI for Interim Reports 1-3. Zhu digitally signed the Final Report Certifications as PI and P. Zhang digitally signed as Authorized Company Officer using ypzhang@vt.edu. The certifications signed by Zhu and P. Zhang stated:

"I understand that the willful provision of false information or concealing a material fact in this report or any other communication submitted to NSF is a criminal offense (U.S. Code, Title 18, Section 1001)."

53. P. Zhang is listed as Co-Investigator in Interim Reports 2 and 3 and the Final Report for NSF award IIP-1353266 with ypzhang@vt.edu.

54. You is listed as Staff Scientist in the Final Report for NSF award IIP-1353266 with yoshion@vt.edu.

55. For NSF award IIP-1353266, the Final Report Milestone Chart reported \$196,026 of expenditures paid to Virginia Tech for "Subawards." The Milestone Chart was a requisite part of the Final Report that Balan approved in order to release payment, but NSF withheld this payment to CFB following a recommendation from NSF-OIG. NSF required actual expenditures to be accurately reported on the Final Report Milestone Chart.

56. The CFB award ledgers as of July 30, 2016 showed only \$147,019.50 of payments to Virginia Tech in reference to the NSF award IIP-1353266 subaward.

57. NSF-OIG sent Virginia Tech a subpoena on June 24, 2016, and requested, among other documentation, subcontract agreements with and payments received from CFB.

58. In Virginia Tech's response received by NSF-OIG on July 25, 2016, Virginia Tech invoiced CFB for and received only \$147,019.50 under the NSF award IIP-1353266

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subaward as of June 29, 2016.

59. Balan provided NSF-OIG emails he received from P. Zhang on June 25, 2016 and January 25, 2017; P. Zhang wrote these emails to Balan from ypzhang@vt.edu. In the June 25, 2016 email, P. Zhang requested the status of the final payment for NSF award IIP-1353266 to pay remaining obligations, including the “remaining payment for the subcontract to Virginia Tech.” In the January 25, 2017 email, P. Zhang again requested the status of the final payment for NSF award IIP-1353266 and attached an invoice from Virginia Tech for \$49,006.50 covering the period March 1, 2015-September 30, 2016. Thus, as of January 25, 2017, Virginia Tech had not been paid \$196,026, as was represented by Zhu and P. Zhang when they certified that all of the funds committed to the award had been fully expended as designated in the grant budget in the NSF award IIP-1353266 Final Report certifications and as reflected in the NSF award IIP-1353266 Final Report Milestone Chart.

60. According to a representative of Virginia Tech, as of July 31, 2017, Virginia Tech has only received \$147,019.50 under the NSF award IIP-1353266 subaward.

61. According to one of the general ledgers provided by P. Zhang in response to the subpoenas, Hui Ma (Ma), purported to be CFB’s Vice President of Marketing, was paid from NSF award IIP-1353266 grant funds even though no funds had been allocated for him in the approved budget. Ma was also not reported as having worked on the project in the Milestone Charts. According to Ma’s signed CFB offer letter also provided by P. Zhang in the response to the subpoenas, *“Your responsibility as Vice President is to extend business opportunity [sic] of the Company in China, in particular, synthetic starch made from cellulosic biomass, along with the coproduction of other biofuels and value-added biochemicals.”*

62. Additionally, in the NSF award IIP-1353266 Final Report, CFB represented to

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NSF that Wichelecki worked on the project for approximately four months and “Performed experiments.” In the Final Report Milestone Chart, CFB represented Wichelecki was paid \$15,464.37 from the award for months 18-24.

63. In a May 4, 2017 interview, when NSF-OIG asked Wichelecki if he ever worked on the bio-battery project, he answered, “Not at all, no.” Thus, the representations made by CFB concerning Wichelecki in the IIP-1353266 Final Report certified by P. Zhang and Zhu appear to be false. The IIP-1353266 Final Report was electronically submitted and requested additional award payments from NSF.

64. The quarterly timesheets provided by P. Zhang in response to the NSF-OIG subpoena did not track employee effort on specific projects, contrary to the representations made by CFB during the CAAR review for NSF award IIP-1353266. Consequently, the representations made by CFB concerning employee time and effort in the NSF award IIP-1353266 reports and Milestone Charts certified by P. Zhang and Zhu cannot be verified by comparison with the timesheets provided to NSF-OIG by P. Zhang.

65. Based upon the records provided by CFB to both NSF and NSF-OIG and NSF-OIG’s interview with Wichelecki, I have probable cause to believe that Zhu’s and P. Zhang’s certifications that CFB complied with award terms and conditions and spent award funds in accordance with the approved budget were false.

66. In the proposal for DOE award DE-SC0013229, CFB certified “Yes” to “In the joint research and development proposed in this project, does the small business perform at least 40% of the work and the research institution named in the application perform at least 30% of the work?” Zhu signed the proposal as the Authorized Representative on October 13, 2014 and selected “I agree” to the following:

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"By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious. Or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. [sic] (U.S. Code, Title 18, Section 1001)"

67. Contrary to the certification in the proposal for DOE award DE-SC0013229, Virginia Tech only appears to have been paid for approximately 18% of the work per CFB's award ledger rather than the required 30% for STTR awards. The approved budget of \$149,265 for DOE award DE-SC0013229 included a \$48,843 subaward to Virginia Tech, but CFB's ledger and supporting documents received by NSF-OIG on August 16, 2016 only showed \$27,311.29 in payments to Virginia Tech.

68. In Virginia Tech's response to an NSF-OIG subpoena, there were two unpaid invoices to CFB totaling approximately \$19,000 that appear related to DOE award DE-SC0013229. Virginia Tech's records as of June 29, 2016, well after the November 16, 2015 end date for DOE award DE-SC0013229, only showed \$27,311.29 received from CFB.

69. At least part of that discrepancy may be accounted for in CFB's general ledger for DOE award DE-SC0013229. That document, provided by P. Zhang, showed \$11,000 being transferred to another CFB account, into which NSF award funds were deposited, on March 18, 2015, as reimbursement for a "sign up bonus" paid to You when he joined CFB. You's offer letter provided by P. Zhang in response to the subpoenas stated, "Your signing bonus is \$11,000, which will be paid in March 1, 2015."

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70. On the “Final Schedule of Costs by Element & Certification” for DOE award DE-SC0013229, Zhu signed the document and dated it May 30, 2016, certifying, “a minimum of 30% of the funding, excluding any purchased or leased equipment, materials, and supplies, must be allocated to the research institution,” despite the contrary information in CFB’s general ledgers and Virginia Tech’s records.

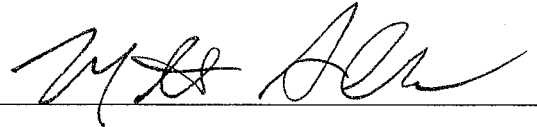
71. According to the DOE award DE-SC0013229 general ledger, CFB received its final DOE payment on October 29, 2015, for a total of \$149,265 in award funds received. As of June 29, 2016, the last dated entry in the DOE award DE-SC0013229 general ledger, only \$1,784.53 remained from the award funds.

72. According to a representative of Virginia Tech, as of July 31, 2017, Virginia Tech has only received \$27,311.29 under the DOE award DE-SC0013229 subaward.

73. Based upon the records provided by CFB and Virginia Tech to NSF-OIG and by CFB to DOE, I have probable cause to believe that Zhu’s certification that CFB paid Virginia Tech the required 30% minimum under the DOE award DE-SC0013229 subaward, which P. Zhang supervised, was false.

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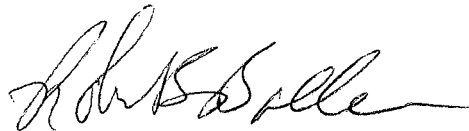
74. In summary, there is probable cause to believe that P. Zhang violated 18 U.S.C. § 371 in conjunction with activities related to violations of 18 U.S.C. § 1343 (wire fraud), 287 (criminal false claims), and 1001 (false statements) to the detriment of the United States Government's innovation and development programs, and your affiant requests that an arrest warrant be issued for P. Zhang.

A handwritten signature in black ink, appearing to read 'M. S. Seckers', written over a horizontal line.

Matthew S. Seckers, Special Agent, FBI

Sworn to and subscribed before me

This 18th day of September, 2017.

A handwritten signature in black ink, appearing to read 'R. Ballou', written over a horizontal line.

The Honorable Robert Ballou

United States Magistrate Judge