

Filed on behalf of Junior Party

Paper No. ____

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA,
UNIVERSITY OF VIENNA, AND EMMANUELLE CHARPENTIER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, UNIVERSITY
OF VIENNA, AND EMMANUELLE CHARPENTIER

Junior Party

(Applications 15/947,680; 15/947,700; 15/947,718; 15/981,807; 15/981,808; 15/981,809;
16/136,159; 16/136,165; 16/136,168; 16/136,175; 16/276,361; 16/276,365; 16/276,368; and
16/276,374),

v.

THE BROAD INSTITUTE, INC., MASSACHUSETTS INSTITUTE OF
TECHNOLOGY, and PRESIDENT AND FELLOWS OF HARVARD COLLEGE

Senior Party

(Patents 8,697,359; 8,771,945; 8,795,965; 8,865,406; 8,871,445; 8,889,356;
8,895,308; 8,906,616; 8,932,814; 8,945,839; 8,993,233; 8,999,641; 9,840,713; and
Application 14/704,551).

Patent Interference No. 106,115 (DK)
(Technology Center 1600)

CVC'S ADDITIONAL JUSTIFICATIONS SUPPORTING AUTHORIZING A MOTION
FOR UNPATENTABILITY DUE TO INEQUITABLE CONDUCT

1 The following additional justifications support authorizing a motion for unpatentability due
2 to inequitable conduct. Paper 2854, 2. As the PTAB predicted in its order authorizing motions, the
3 record on inequitable conduct overlaps with that on priority. Paper 22, 10. Information obtained
4 during this interference—including inventor admissions, statements made by Broad, and testimony
5 from third-party Luciano Marraffini—shows that Feng Zhang made knowingly false statements in
6 declarations submitted during prosecution of each of Broad's involved patents and application with
7 intent to deceive the Office. Such false declarations are *per se* material. *Therasense, Inc. v. Becton,*
8 *Dickinson & Co.*, 649 F.3d 1276, 1292 (Fed. Cir. 2011) (en banc) (stating that “[w]hen the patentee
9 has engaged in affirmative acts of egregious misconduct, such as the filing of an unmistakably
10 false affidavit, the misconduct is material”). Zhang's false statements are also material because the
11 examiner expressly relied on them in permitting Broad to antedate the prior art and thereby secure
12 allowance. Additional justifications for authorizing the requested motion are identified below.

13 **1. Zhang gave testimony in this interference demonstrating that his 2014**
14 **Declaration knowingly mischaracterized his March 2011 experiments.**

15 Zhang signed a declaration dated January 30, 2014 (“the 2014 Declaration”) attesting that
16 “Exhibit 7 [i.e., experiments conducted *in March 2011, as first revealed in this interference*] shows
17 that prior to May 2012, I conceived and reduced to practice [a]n engineered, programmable,
18 non-naturally occurring Type II CRISPR-Cas system” Ex. 3424 (Part 3), Appx. A, ¶5.1.5. That
19 statement was knowingly false. Zhang has since conceded that those experiments did not include
20 any tracrRNA, which he knew was a necessary component when he signed his 2014 Declaration.

21 Zhang admitted, during cross-examination and in his 2020 inventor declaration, that he did
22 not begin introducing any form of tracrRNA into his experiments until April of 2011. Specifically,
23 Zhang testified that he learned about the existence of tracrRNA only after reading Deltcheva et al.
24 (Ex. 3214), which first published in *Nature* on March 30, 2011. Ex. 5262, Zhang Dep. Tr., 78:12-

1 17 (“I learned about tracrRNA from the Deltcheva paper.”); Ex. 3424, Zhang Decl., ¶70 (“[a]fter
2 studying Deltcheva et al., I immediately *began* to include tracrRNA with my system”) (emphasis
3 added). Zhang testified that he started adding “the native tracrRNA” on April 5, 2011—thus, after
4 the March 2011 experiments. Ex. 3424, 2020 Zhang Decl., ¶71; Ex. 5262, Zhang Dep., 90:12-17.

5 Zhang’s admissions are consistent with Marraffini’s subpoenaed testimony that Zhang did
6 not know that tracrRNA was part of the DNA-cleavage complex until June 26, 2012. Ex. 5265,
7 Marraffini Dep. Tr., 29:20-30:3; Ex. 3713, 27–29. By the time Zhang signed his 2014 Declaration,
8 however, he did know that tracrRNA was a necessary part of the Type II CRISPR-Cas9 system.
9 *See, e.g.*, Ex. 3019, ’414 Application, [0070], [0048]; Ex. 3201, Cong 2013, 820 (stating tracrRNA
10 is “necessary” and citing Jinek 2012). And Zhang knew that his March 2011 experiments did not
11 include any form of tracrRNA. It was therefore knowingly false to declare that these experiments
12 “describe and enable” and “reduced to practice” the claimed Type II CRISPR-Cas9 system. Ex.
13 3424, 2014 Zhang Decl., ¶¶5.1.2, 5.1.5. This statement was unmistakably false, and therefore *per*
14 *se* material to patentability. Moreover, the examiner expressly relied on Zhang’s 2014 Declaration
15 in her reasons for allowance in each of Broad’s 13 involved patents and involved ’551 application.

16 Zhang had intent to deceive the examiner. In the 2014 Declaration Zhang attests to having
17 personal knowledge of the March 2011 experiments. *Id.* at ¶5.1. He further attests to understanding
18 that his declaration was for the purpose of removing prior art to obtain allowance of claims. *Id.* at
19 ¶5 (“*I understand that ... if I can show conception and actual reduction to practice prior to the*
20 *filing dates of the [art] ... then I have removed the [art] from being prior art ...*”) (emphasis added).

21 **2. The record in this interference shows that Zhang’s 2015 Declaration**
22 **misrepresents his alleged possession of “a single molecule” guide RNA.**

23 Zhang made another declaration dated December 21, 2015 (“the 2015 Declaration”), which
24 Broad submitted to antedate prior art in the ’551 application—this time to secure claims to a single-

1 molecule guide Type II CRISPR-Cas9 system. In the 2015 Declaration, Zhang attests that Figure
2 4B in a 2012 grant proposal to the National Institutes of Health (“the NIH grant”) showed that “a
3 single RNA can be used as a guide in the CRISPR-Cas9 system.” Ex. 3424 (Part 4), Appx. D, ¶19;
4 *id.* at ¶22(j). Yet Zhang and Broad have represented in this proceeding that the same Figure 4B of
5 the NIH grant shows a *dual-molecule* guide system and *not* a single-molecule guide system.

6 In his 2015 Declaration, Zhang included an annotated version of Figure 4 of the NIH grant
7 (“part B”), with arrows and three cartoons added beneath. *Compare* Ex. 3051, p. 16, *with* Ex. 3424,
8 2015 Zhang Decl., ¶18. Zhang then attested: “Having generated the figure of part B in the above-
9 illustration from the January 12, 2012 R01 NIH grant application, prior to January 12, 2012, I
10 appreciated the mammalian expression system illustrated could be constructed, and when
11 introduced into a mammalian cell could express products and function in vivo for cleavage and
12 genome editing, as illustrated above, and as actually done prior to November 30, 2011, *with*
13 *appreciation that a single RNA can be used as a guide in the CRISPR-Cas system, including as*
14 *shown by ... the illustration of the NIH R01 grant application*” Ex. 3424, 2015 Zhang Decl.,
15 ¶19 (emphasis added). Zhang testified that the phrase “used as a guide” in his 2015 Declaration
16 referred to the “RNA that’s guiding Cas9 to the target.” Ex. 5262, Zhang Dep. Tr., 236:18–237:7.
17 Thus, in 2015, Zhang declared to the Office that Figure 4B “show[ed]” that he appreciated that “a
18 single RNA can be used as a guide in the CRISPR-Cas system.” Ex. 3424, 2015 Zhang Decl., ¶19.

19 That statement was knowingly false. Zhang has admitted in this proceeding that Figure 4B
20 in fact shows a *dual-molecule* guide system. In Zhang’s 2020 declaration for this proceeding, he
21 discusses the same annotated version of Figure 4B of the NIH grant and affirmatively testifies that
22 it shows “a dual-molecule RNA system.” *Id.* at ¶89 (“The expression shown in the bottom half of
23 the figure would express hSt1Cas9, tracrRNA and a CRISPR array to form a dual-molecule RNA

1 system.”); *compare* Ex. 3424, 2015 Zhang Decl., ¶18, *with* Ex. 3424, 2020 Zhang Decl., ¶89.

2 Consistent with Zhang’s 2020 testimony, Broad has argued in this interference that Figure
3 4B of the NIH grant shows a dual-molecule system and *not* a single-molecule system. In support
4 of its motions to change the count and de-designate claims, Broad and its expert have asserted that
5 the same Figure 4B “describes a *dual-molecule* guide RNA in the CRISPR-Cas9 system,” Ex.
6 3401, ¶7.7, one that “**would not include** a covalently-linked / single-molecule guide RNA as part
7 of the complex” *id.* at ¶7.9 (emphases added). Paper 268, 8:2–4; 8:10–13; 8:6–9; 7:21–25. Broad
8 has argued the same in moving to change the count in its interference against ToolGen. Inf. No.
9 106,126, Paper 72, 9:2–5 (Figure 4B “would provide a *dual-molecule* tracrRNA:crRNA duplex
10 after processing,” and “**would not include** a single-molecule RNA as part of the active cutting
11 complex”) (emphasis added). Zhang’s 2020 testimony and Broad’s statements in this interference
12 confirm that Zhang’s representation regarding Figure 4B made in his 2015 Declaration was false.
13 Zhang knew these statements were false when he made them, as he attested to having “generated”
14 the figure and having “prepared” the NIH grant himself. Ex. 3424, 2015 Zhang Decl., ¶¶19, 15.

15 That the NIH grant does not show a single-guide CRISPR-Cas9 system is consistent with
16 Marraffini’s testimony that he first conveyed such a system to Zhang on June 26, 2012, by showing
17 him CVC’s work. Ex. 5265, Marraffini Dep. Tr., 26:5–14; Ex. 3713, 27. It is also consistent with
18 the fact that Broad has not argued in this interference that Zhang conceived of such a system before
19 June 26, 2012, arguing instead that its earlier proofs, e.g., the NIH grant, are limited to dual-guide.

20 Zhang’s 2015 statement, that Figure 4B shows appreciation that “a single RNA can be used
21 as a guide in the CRISPR-Cas system,” was unmistakably false and thus *per se* material. Ex. 3424,
22 2015 Zhang Decl., ¶19. And the examiner expressly relied, on the 2015 Declaration in the statement
23 of reasons for allowance for the involved ’551 application, which includes single-guide claims.

1 Zhang had intent to deceive the Office, as he understood that he was attesting to activities
2 related to his “diligence.” Ex. 3424, 2015 Zhang Decl., ¶¶14, 19. Zhang also attended an examiner
3 interview on September 9, 2015, that involved discussion of “whether there need be consideration
4 of interference [sic] as to [CVC] applications.” ’551 Application File History, Applicant Interview
5 Summary (Oct. 2, 2015), pp. 1, 27. Within months, Broad submitted Zhang’s 2015 Declaration in
6 prosecution to antedate the prior art, asserting that it showed that “Zhang had a conception and
7 reduction to practice of a CRISPR-Cas9 system having *a crRNA fused with tracr ...*” before
8 November 30, 2011. *Id.* at Applicant Remarks/Arguments (Jan. 5, 2016), p. 66 (emphasis added).

9 **3. This motion should be heard before a final judgment; the factual record is**
10 **complete, no discovery is required, and resolution is in the public interest.**

11 This case is like *McDonald v. Miyazaki*, where an inventor submitted a declaration during
12 prosecution that misrepresented certain experiments and activities in an effort to antedate prior art,
13 as confirmed by testimony the inventor gave during the interference. Inf. No. 104,544, Paper 149,
14 at 24, 30 (B.P.A.I. 2003). The Board called this “the sort of over-reaching and truth-shaving that
15 Rule 56 was enacted to prevent,” and entered a judgment canceling all of the inventor’s involved
16 claims on the basis of inequitable conduct. *Id.* at 31. Even more egregious and pervasive than what
17 occurred in *McDonald*, Broad filed the 2014 Declaration in all 13 of Broad’s involved patents, its
18 involved ’551 application, and in other applications as recently as 2020. And Zhang incorporated
19 both false declarations into his testimony in this interference. *See* Ex. 3424, Zhang Decl., ¶228.

20 The law and the facts justify hearing this motion before a final judgment. This issue affects
21 Broad’s right to have issued or allowable claims. *See Norton v. Curtiss*, 433 F.2d 779, 783, 793–94
22 (C.C.P.A. 1971). The factual record is complete. No discovery is required. Additionally, the PTAB
23 has a duty to protect the public from inequitably procured patents and to enforce Rule 56 to prevent
24 abuse of declaration practice, as the examining corps is not equipped to police such misconduct.

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Date: November 18, 2021

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APPENDIX 1 – LIST OF EXHIBITS

Exhibit No.	Description
Exhibit 3019	U.S. Patent Application 14/054,414, Zhang, Original Specification, October 15, 2013
Exhibit 3201	Cong et al., Multiplex Genome Engineering Using CRISPR/Cas Systems, 339(6121) SCIENCE 819-823 (2013) with Supplemental Material
Exhibit 3214	Deltcheva et al., CRISPR RNA maturation by trans-encoded small RNA and host factor RNase III, 471 NATURE 602-607 (2011) with Supplementary Materials
Exhibit 3401	Declaration of Christoph Seeger, executed October 14, 2019
Exhibit 3424	Declaration of Feng Zhang, dated December 17, 2020 <ul style="list-style-type: none"> ▪ Exhibit Part 3, Appendix A, Declaration of Feng Zhang executed January 30, 2014 (“the 2014 Declaration”) ▪ Exhibit Part 4, Appendix D, Declaration of Feng Zhang executed December 21, 2015 (“the 2015 Declaration”)
Exhibit 3713	String of emails between Feng Zhang and Luciano Marraffini in 2012
Exhibit 5262	Deposition transcript of Feng Zhang, Ph.D., with errata, Patent Interference No. 106,115 (February 9, 2021)
Exhibit 5265	Deposition transcript of Luciano Marraffini, Ph.D., Patent Interference No. 106,115 (March 11, 2021)

CERTIFICATE OF SERVICE

I hereby certify that the foregoing **CVC'S ADDITIONAL JUSTIFICATIONS** was filed via the Interference Web Portal by 8:00 PM Eastern Time on November 18, 2021, pursuant to an agreement between the parties, and thereby served on the attorney of record for the Senior Party pursuant to ¶105.3 of the Standing Order. Pursuant to the agreement between the parties, the foregoing was also served via email by 11:00 PM Eastern Time on counsel for the Senior Party at:

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