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UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
SOUTHERN DIVISION

AARON KHERIATY, M.D., Plaintiff, v. THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, a corporation, *et al.*,	Case No.: 8:21-cv-01367 JVS (KESx) **DECLARATION OF UNIVERSITY OF CALIFORNIA FACULTY IN SUPPORT OF PLAINTIFF'S REPLY TO HIS MOTION FOR PRELIMINARY INJUNCTION**

Defendants.	Date: September 27, 2021 Time: 1:30 pm Place: Courtroom 10C Judge: Hon. James V. Selna

We, the undersigned, declare as follows:

1. We are adults of sound mind and make this declaration voluntarily, based upon our own personal knowledge, education, and experience.

2. We respond to points raised by the five expert declarations filed by the Defendants.

3. Defendants' leading expert, Dr. Crotty's carefully worded declaration avoids his many published studies which clearly demonstrate that natural immunity is robust and long-lasting. As one example, Dr. Crotty, has published that after infection, "development of B cell memory to SARS-CoV-2 was robust, and is likely long-lasting" and "immune memory to SARS-CoV-2 develops in almost all subjects."[1]

[1] Dan JM, Mateus J, Kato Y, Hastie KM, Yu ED, Faliti CE, Grifoni A, Ramirez SI, Haupt S, Frazier A, Nakao C, Rayaprolu V, Rawlings SA, Peters B, Krammer F, Simon V, Saphire EO, Smith DM, Weiskopf D, Sette A, Crotty S. Immunological memory to SARS-CoV-2 assessed for up to 8 months after infection. Science. 2021 Feb 5;371(6529):eabf4063. doi: 10.1126/science.abf4063. Epub 2021 Jan 6. PMID: 33408181; PMCID: PMC7919858. https://pubmed.ncbi.nlm.nih.gov/33408181/.

4. Most importantly, nowhere in Dr. Crotty's entire declaration – from an immunologist who UC contends is the only person fit to discuss immunity after vaccination or infection – does Dr. Crotty contest the following points:

a. That upon exposure to SARS-CoV-2, the CDC confirms that vaccinated individuals can become infected with and spread the virus[2] ("non-sterilizing immunity"), but naturally immune individuals' immunity prevents them from becoming infected with and spreading this virus ("sterilizing immunity").

b. That when symptomatic cases occur, the rate among vaccinated individuals ("breakthrough cases") is multiple fold higher than the rate among the naturally immune ("reinfections").

c. That there has never been a single documented case of a reinfection resulting in further transmission of the virus, while there have been many documented cases of breakthrough infections resulting in subsequent transmission.

5. Nor do any of the other experts that provided declarations for Defendants provide a shred of data or a single study that contradicts the above three points.

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[2] https://www.cdc.gov/coronavirus/2019-ncov/variants/delta-variant.html.

I. COVID-19 Vaccine Efficacy

6. Contrary to what Dr. Crotty implies regarding the vaccines' efficacy, the studies and data and Pfizer's own admission, discussed below, make clear that the COVID-19 vaccines do not "provide exceptional protection." (Declaration of Shane Crotty, Dkt. No 21.3, "Crotty Dec.", ¶¶ 20-24.) Pfizer's interim clinical trial results, for example, demonstrate 95% effectiveness after two months in preventing symptomatic COVID-19 in those who have not been previously infected.[3] Moderna's interim clinical trial results demonstrate 94.1% effectiveness after two months in preventing symptomatic COVID-19 in those who have not been previously infected.[4] Even in these ideal, controlled situations, against the Alpha variant, the two mRNA vaccines have a significant gap in efficacy in preventing disease at any point in time.

7. Moreover, contrary to Dr. Crotty's claims about "real world" studies, the data shows rapidly falling efficacy of both mRNA vaccines. Crotty Dec. ¶ 21. A Mayo Clinic study looked at the COVID-19 mRNA vaccines' efficacy over time from January

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[3] https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm?s_cid=mm6950e2_w.

[4] Comparison of two highly-effective mRNA vaccines for COVID-19 during periods of Alpha and Delta variant prevalence. Arjun Puranik, Patrick J. Lenehan, Eli Silvert, Michiel J.M. Niesen, Juan Corchado-Garcia, John C. O'Horo, Abinash Virk, Melanie D. Swift, John Halamka, Andrew D. Badley, A.J. Venkatakrishnan, Venky Soundararajan medRxiv 2021.08.06.21261707; doi: https://doi.org/10.1101/2021.08.06.21261707; https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e1.htm?s_cid=mm695152e1_w.

to July 2021, during which either the Alpha or Delta variant was highly prevalent. The results showed that as of July, the efficacy of Moderna's vaccine had dropped to 76% and the efficacy for Pfizer's vaccine dropped to 42%.[5] This is consistent with Pfizer's data which demonstrates the vaccine's efficacy falling by about 6 percent every two months (with data only through "up to 6 months").[6] This flatly contradicts Dr. Crotty's conclusions that these vaccines have "shown outstanding efficacy against variants of concern" and that their efficacy in clinical trials "have been confirmed in 'real world' studies." Crotty Dec. ¶ 21.

8. Dr. Crotty cites Pfizer's vaccine efficacy "over six months in the USA" as 91%. Crotty Dec. ¶ 21. Dr. Crotty' statement is not truthful. As Pfizer has admitted, the

[5] Comparison of two highly-effective mRNA vaccines for COVID-19 during periods of Alpha and Delta variant prevalence. Arjun Puranik, Patrick J. Lenehan, Eli Silvert, Michiel J.M. Niesen, Juan Corchado-Garcia, John C. O'Horo, Abinash Virk, Melanie D. Swift, John Halamka, Andrew D. Badley, A.J. Venkatakrishnan, Venky Soundararajan medRxiv 2021.08.06.21261707; doi: https://doi.org/10.1101/2021.08.06.21261707; https://www.medrxiv.org/content/10.1101/2021.08.06.21261707v1.

[6] Six Month Safety and Efficacy of the BNT162b2 mRNA COVID-19 Vaccine Stephen J. Thomas, Edson D. Moreira Jr., Nicholas Kitchin, Judith Absalon, Alejandra Gurtman, Stephen Lockhart, John L. Perez, Gonzalo Pérez Marc, Fernando P. Polack, Cristiano Zerbini, Ruth Bailey, Kena A. Swanson, Xia Xu, Satrajit Roychoudhury, Kenneth Koury, Salim Bouguermouh, Warren V. Kalina, David Cooper, Robert W. Frenck Jr., Laura L. Hammitt, Özlem Türeci, Haylene Nell, Axel Schaefer, Serhat Ünal, Qi Yang, Paul Liberator, Dina B. Tresnan, Susan Mather, Philip R. Dormitzer, Uğur Şahin, William C. Gruber, Kathrin U. Jansen, C4591001 Clinical Trial Group medRxiv 2021.07.28.21261159; doi: https://doi.org/10.1101/2021.07.28.21261159; https://www.medrxiv.org/content/10.1101/2021.07.28.21261159v1.full.pdf.

efficacy of its vaccine falls by an average of 6% every two months.[7] For example, the vaccine's effectiveness was strongest, at 96.2%, between one week and two months after receiving the second dose, and Pfizer's CEO said, "[t]he efficacy after "four to six months was approximately 84%."[8] Meaning, in reality, the efficacy is closer to 78% and at one year, is 60% and by 18 months, is at 42%, assuming the decline continues linearly rather than, as typically happens, exponentially.

II. Preventing Infection and Transmission

9. Despite Dr. Crotty's naked claim that "the Pfizer and Moderna vaccines also have provided exceptional protection against…transmission," for which he cites no data or studies, all of the studies and data reflect the reality that COVID-19 vaccines do not stop infection, nor do they stop transmission. Crotty Dec. ¶ 20. The clinical trial's primary endpoint for the COVID-19 vaccines is measuring effectiveness against disease – not against infection.[9]

10. Once used in the real-world, the CDC Director Walensky has acknowledged that "What [the vaccines] can't do anymore is prevent infection or transmission."[10] This

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[7] https://www.cnbc.com/2021/07/28/pfizers-ceo-says-covid-vaccine-effectiveness-drops-to-84percent-after-six-months.html.

[8] Ibid.

[9] https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e2.htm?s_cid=mm6950e2_w; https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e1.htm?s_cid=mm695152e1_w.

[10] https://twitter.com/CNNSitRoom/status/1423422301882748929.

is confirmed by numerous studies.[11] Dr. Crotty's uncited statement about preventing transmission, in any event, focuses on the Alpha variant by claiming that the vaccines "*were* incredibly effective at stopping the Alpha wave in the USA in early 2021." Crotty Dec. ¶ 45. First, it is unclear if Dr. Crotty is actually claiming that the vaccine prevented Alpha infections, as opposed to hospitalization and deaths. If he is claiming it prevented transmission of Alpha, it is irrelevant because the Delta strain is what is currently circulating in the United States, not the Alpha strain, and the vaccine does not prevent infection and transmission of Delta. In any event, by March 2021, less than 20% of the U.S. population received at least one dose of the vaccine,[12] and hence any claim about

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[11]Evaluation of the mRNA-1273 Vaccine against SARS-CoV-2 in Nonhuman Primates, Kizzmekia S. Corbett, Ph.D, et al., October 15, 2020. N Engl J Med 2020; 383:1544-1555, DOI:10.1056/NEJMoa2024671; https://www.nejm.org/doi/full/10.1056/NEJMoa2024671; Van Doremalen N, Lambe T, Spencer A, Belij-Rammerstorfer S, Purushotham JN, Port JR, Avanzato V, Bushmaker T, Flaxman A, Ulaszewska M, Feldmann F, Allen ER, Sharpe H, Schulz J, Holbrook M, Okumura A, Meade-White K, Pérez-Pérez L, Bissett C, Gilbride C, Williamson BN, Rosenke R, Long D, Ishwarbhai A, Kailath R, Rose L, Morris S, Powers C, Lovaglio J, Hanley PW, Scott D, Saturday G, de Wit E, Gilbert SC, Munster VJ. ChAdOx1 nCoV-19 vaccination prevents SARS-CoV-2 pneumonia in rhesus macaques. bioRxiv [Preprint]. 2020 May 13:2020.05.13.093195. doi: 10.1101/2020.05.13.093195. Update in: Nature. 2020 Jul 30;: PMID: 32511340; PMCID: PMC7241103. Forma; https://pubmed.ncbi.nlm.nih.gov/32511340/; Brown CM, Vostok J, Johnson H, et al. Outbreak of SARS-CoV-2 Infections, Including COVID-19 Vaccine Breakthrough Infections, Associated with Large Public Gatherings — Barnstable County, Massachusetts, July 2021. MMWR Morb Mortal Wkly Rep 2021;70:1059-1062. DOI: http://dx.doi.org/10.15585/mmwr.mm7031e2; https://pubmed.ncbi.nlm.nih.gov/32616673/; https://www.cdc.gov/mmwr/volumes/70/wr/mm7031e2.htm.

[12] https://www.msn.com/en-us/news/world/u-s-passes-100-million-doses-italy-locks-down-virus-update/ar-BB1euTsC.

how the vaccine stopped the Alpha wave "in early 2021" is detached from reality. Similarly, Dr. Byington's uncited statement that people hesitant to take the vaccine, combined with new variants, "threatens the likelihood of herd immunity on a large scale" (Byington Dec. ¶ 20) is also detached from reality because the vaccines, as confirmed by the CDC, do not stop infection and transmission of Delta. Meaning, the data is clear that there is minimal communal protection from infection and transmission, and herd immunity cannot be achieved as a result of COVID-19 vaccination alone. As the Director of the Oxford Vaccine Group explained: "Herd immunity [from vaccination alone] is not a possibility because [the Delta variant] still infects vaccinated individuals."[13]

11. Dr. Crotty additionally claims that "the vast majority of SARS-CoV-2 transmission in the USA is by unvaccinated individuals." Crotty Dec. ¶ 45. Putting aside that he does not cite to any data or evidence for this claim, this statement and Dr. Crotty's next paragraph comparing how often vaccinated individuals transmit Delta compared to unvaccinated individuals (Crotty Dec. ¶46), **are irrelevant distractions**. Dr. Crotty is engaging in the wrong comparison in a large part of his declaration when comparing "vaccinated" to "unvaccinated." The appropriate comparison is the vaccinated to the naturally immune. Instead of conducting this comparison, Dr. Crotty instead ignores the

[13] https://twitter.com/Channel4News/status/1425086490002997248.

numerous studies within our original declaration regarding same which show that natural immunity is superior to vaccine immunity. Dkt. No. 15-4 at ¶¶ 5-16.

12. Likewise, Dr. Byington's statement that "Nearly all COVID-19-related hospitalizations and deaths in the U.S. and in California now are in people who have not been vaccinated, according to an Associated Press analysis of data from the CDC is disingenuous at best. Dr. Walensky, director of the CDC, also shared this statement and then later rescinded it, acknowledging that the data was from January 2021 (when most Americans were unvaccinated, explaining why most in the hospitalized and dying are unvaccinated) and was through June 2021, prior to when the Delta variant was spreading. Since Dr. Walensky's walking-back of this data, the CDC has not yet released specific data (other than the period from January 2021 through July 2021) showing the percentage of those hospitalized or dying that are vaccinated or unvaccinated.[14] This is also a comparison of vaccinated versus unvaccinated and not vaccinated versus the naturally immune and so it is irrelevant.

13. Another Defendants' expert, Dr. De Saint Maurice, a pediatrician, states that, "[i]t is crucial that we ensure that all our staff is vaccinated in order to prevent transmission between patients and healthcare workers, allowing us to promote a healthy, stable workforce" and that "[w]hen there are safe, effective vaccines to help prevent the

[14] https://www.youtube.com/watch?v=26xwZVEOKFU&t=1195s ("So those data were data that were from analyses in several states from January through June and didn't reflect the data that we have now from the Delta variant.").

spread of a pandemic disease, physicians have an ethical duty to become immunized." DSM Dec. ¶ 9. And another Defendants' expert, Dr. Bolden-Albada, makes a similar claim that "[v]accines protect individuals from infection and, as importantly, high vaccine coverage in a community protects the community at large." B-A Dec. ¶ 7. Assuming these statements refer to Covid-19 vaccines, which is unclear, neither Dr. De Saint Maurice nor Dr. Bolden-Albada cite to a single study or shred of evidence to support these claims. These baseless and unsupported claims should therefore be disregarded. (Declarations of De Saint Maurice, "DSM Dec." ¶ 8).

14. Reflecting that the COVID-19 vaccines, as confirmed by the CDC and numerous studies, do not prevent infection and transmission, is the example of Cornell University. Despite the fact that 95% of the campus population is vaccinated (both students and faculty), the university has more than five times the amount of confirmed positive cases during its first week of this academic year than it did during its first week of the 2020-21 academic year.[15]

15. We are also aware that the current COVID-19 vaccines will soon be rendered even more ineffective with regard to certain variants and Pfizer's CEO has

[15] https://www.thecollegefix.com/despite-95-vaccination-rate-cornell-today-has-five-times-more-covid-cases-than-it-did-this-time-last-year/.

admitted as much, saying a vaccine-resistant variant will likely emerge.[16] This is confirmed by an August study which found that "the SARS-CoV-2 Delta variant is poised to acquire complete resistance to wild-type spike vaccines."[17] Therefore, Dr. Byington's opinion about what will cause new variants is also misplaced because, in reality, what will cause variants to emerge is pockets of people who do not have sterilizing immunity. Vaccine-induced immunity does not prevent transmission or infection, and this provides an opportunity for the virus to replicate in vaccinated as well as unvaccinated individuals and result in vaccine-immunity resistant variants. In contrast, naturally immune individuals have sterilizing immunity in almost every case, and hence do not silently spread the virus nor act as reservoirs for viral replication and transmission of new variants.

III. Durability of Natural Immunity v. Vaccine Immunity, Including for Delta

16. The evidence that exists to-date shows the durability of natural immunity and its superiority to vaccine-induced immunity, including for the Delta variant.

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[16] https://www.insider.com/pfizer-ceo-vaccine-resistant-coronavius-variant-likely-2021-8.

[17] The SARS-CoV-2 Delta variant is poised to acquire complete resistance to wild-type spike vaccines. Yafei Liu, Noriko Arase, Jun-ichi Kishikawa, Mika Hirose, Songling Li, Asa Tada, Sumiko Matsuoka, Akemi Arakawa, Kanako Akamatsu, Chikako Ono, Hui Jin, Kazuki Kishida, Wataru Nakai, Masako Kohyama, Atsushi Nakagawa, Yoshiaki Yamagishi, Hironori Nakagami, Atsushi Kumanogoh, Yoshiharu Matsuura, Daron M. Standley, Takayuki Kato, Masato Okada, Manabu Fujimoto, Hisashi Arase bioRxiv 2021.08.22.457114; doi: https://doi.org/10.1101/2021.08.22.457114; https://www.biorxiv.org/content/10.1101/2021.08.22.457114v1.

A. Breakthrough Cases v. Reinfections

17. Further contradicting Dr. Crotty's optimistic conclusions about efficacy of the vaccines in the real world, breakthrough cases are happening at a significantly higher rate than reinfection cases. UK's official government COVID-19 data shows a **probable reinfection rate** for COVID-recovered individuals of **0.025%** through August 19, 2021 and during Delta.[18] In contrast, this same data shows, through September 2, 2021, a **vaccine breakthrough rate** for Delta infections of **23%**.[19] This is an alarming comparison and in line with CDC Director Walensky's statement that "A modest percentage of people who are fully vaccinated will still get COVID-19 if they are exposed to the virus that causes it."[20]

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[18] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1012240/Weekly_Flu_and_COVID-19_report_w33.pdf at 17-18.

[19] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1014926/Technical_Briefing_22_21_09_02.pdf at 21. Meanwhile, the CDC – which is only reporting breakthrough cases which lead to hospitalization and death and whose "surveillance relies on passive and voluntary reporting" and acknowledges that "data are not complete or representative" and "are an undercount of all SARS-CoV-2 infections among fully vaccinated persons – has reported 14,115 breakthrough cases; https://www.cdc.gov/vaccines/covid-19/health-departments/breakthrough-cases.html; Notably, Louisiana alone had counted 14,650 breakthrough infections as of August 25, 2021, https://www.politico.com/news/2021/08/25/cdc-pandemic-limited-data-breakthroughs-506823.

[20] https://www.nytimes.com/article/covid-breakthrough-delta-variant.html?campaign_id=190&emc=edit_ufn_20210811&instance_id=37681&nl=updates-from-the-newsroom&regi_id=144202103&segment_id=65980&te=1&user_id=2838fcf05d346bf8ceffa1878e512a6b.

18. The studies are clear, and consistent with the UK data, that reinfections are exceedingly rare, even during Delta's circulation:

a. Researchers from Ireland conducted a review of 11 cohort studies involving over 600,000 total recovered COVID-19 patients who were followed up with for over 10 months and explained that there was "**no study reporting an increase in the risk of reinfection over time**."[21]

b. Israeli researchers analyzed 6.3 million Israelis and found one death of an individual who potentially had previously had COVID-19. This individual was elderly (over 80 years old).[22]

c. French researchers tested blood samples from health care workers who were COVID-19 naïve and received two doses of Pfizer's vaccine and compared them to those from health care workers who had a previous mild infection and a third group of patients who each had a serious case of COVID-19. They found, "No neutralization escape could be feared

[21] OMurchuE,ByrneP,CartyPG,etal., QuantifyingtheriskofSARS-CoV-2reinfectionovertime.Rev MedVirol.2021;e2260.https://doi.org/10.1002/rmv.2260; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8209951/pdf/RMV-9999-e2260.pdf.

[22] Protection of previous SARS-CoV-2 infection is similar to that of BNT162b2 vaccine protection: A three-month nationwide experience from Israel. Yair Goldberg, Micha Mandel, Yonatan Woodbridge, Ronen Fluss, Ilya Novikov, Rami Yaari, Arnona Ziv, Laurence Freedman, Amit Huppert medRxiv 2021.04.20.21255670; doi: https://doi.org/10.1101/2021.04.20.21255670; https://www.medrxiv.org/content/10.1101/2021.04.20.21255670v1.

concerning the two variants of concern [Alpha and Beta] in" those previously infected.[23]

d. Researchers from Qatar analyzed the population-level risk of reinfection based on whole genome sequencing in a subset of patients with supporting evidence of reinfection. Researchers estimated the risk of reinfection at 0.66 per 10,000 person-weeks and did not report any transmission from any case of reinfection. Notably, the study found no evidence of waning of immunity for the over seven-month follow-up period.[24]

e. A study of 1,359 previously infected health care workers in the Cleveland Clinic system reports that: "Not one of the 1359 previously infected

[23] Live virus neutralisation testing in convalescent patients and subjects vaccinated against 19A, 20B, 20I/501Y.V1 and 20H/501Y.V2 isolates of SARS-CoV-2 Claudia Gonzalez, Carla Saade, Antonin Bal, Martine Valette, Kahina Saker, Bruno Lina, Laurence Josset, Mary-Anne Trabaud, Guillaume Thiery, Elisabeth Botelho-Nevers, Stéphane Paul, Paul Verhoeven, Thomas Bourlet, Sylvie Pillet, Florence Morfin, Sophie Trouillet-Assant, Bruno Pozzetto medRxiv 2021.05.11.21256578; doi: https://doi.org/10.1101/2021.05.11.21256578; https://www.medrxiv.org/content/10.1101/2021.05.11.21256578v1 (emphasis added).

[24] SARS-CoV-2 antibody-positivity protects against reinfection for at least seven months with 95% efficacy; Laith J. Abu-Raddad, et al.; The Lancet; April 27, 2021; https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(21)00141-3/fulltext#%20.

subjects who remained unvaccinated had a SARS-CoV-2 infection over the duration of the study."[25]

19. Even in the face of clear data that reinfections are not commonly occurring, Dr. Byington claims that COVID-19 vaccines are recommended for those who have already been infected "as an added layer of protection against reinfection and disease spread." Byington Dec. ¶ 24. Dr. Byington does not provide any sources to demonstrate that those recovered need or actually receive any "added layer of protection" and does not provide even one documented example of a reinfection that resulted in "disease spread."

20. In contrast, the rate of breakthrough cases are multiple times higher as confirmed by all of the studies that have looked at this issue, including those in our opening declaration. A recent Israeli study compared reinfections in 42,000 naturally immune individuals to vaccine breakthrough infections in 62,000 fully vaccinated individuals. Their study showed that the fully vaccinated individuals were 6 to 13 times more likely to get infected than those previously infected. Additionally, the risk of symptomatic COVID-19 was 27 times higher among those vaccinated than those previously infected and the risk of hospitalization was 8 times higher. The study

[25] Necessity of COVID-19 vaccination in previously infected individuals Nabin K. Shrestha, Patrick C. Burke, Amy S. Nowacki, Paul Terpeluk, Steven M. GordonmedRxiv 2021.06.01.21258176; doi: https://doi.org/10.1101/2021.06.01.21258176; https://www.medrxiv.org/content/10.1101/2021.06.01.21258176v3.

concluded that, "natural immunity confers longer lasting and stronger protection against infection, symptomatic disease and hospitalization caused by the Delta variant of SARS-CoV-2, compared to the BNT162b2 [Pfizer] two-dose vaccine-induced immunity."[26] This study further demonstrates that previous infection confers >99.5% reduced risk of reinfection and that people with previous infection in those who got vaccinated have 99.7% reduced risk of reinfection. These data – 99.5% vs 99.7% – are negligibly different, which is why immunity from previous infection is much stronger than vaccine immunity, and subsequent vaccination serves no practical benefit.

B. Not a Single Documented Case of Transmission After Reinfection

21. While there are many documented cases of transmission from breakthrough cases,[27] there are no documented cases of transmission from reinfection cases. Despite a world-wide hunt for such a case and the fact that, according to the CDC, over 120.2 million Americans have had COVID-19, Dr. Crotty's best evidence to counter this point is a single case where the authors speculate that transmission occurred after reinfection

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[26] Comparing SARS-CoV-2 natural immunity to vaccine-induced immunity: reinfections versus breakthrough infections. Sivan Gazit, Roei Shlezinger, Galit Perez, Roni Lotan, Asaf Peretz, Amir Ben-Tov, Dani Cohen, Khitam Muhsen, Gabriel Chodick, Tal Patalon medRxiv 2021.08.24.21262415; doi: https://doi.org/10.1101/2021.08.24.21262415; https://www.medrxiv.org/content/10.1101/2021.08.24.21262415v1.

[27] https://www.cdc.gov/mmwr/volumes/70/wr/mm7031e2.htm.

but did not confirm that this is what occurred. Crotty Dec. ¶ 45. This one speculative unconfirmed case out of more than 223 million confirmed infections worldwide does not even support his even more speculative conclusion that "it is plausible that persons with reinfections transmit virus." Crotty Dec. ¶ 45. If this was in fact occurring, cases of transmission would have been documented after reinfection the way they are being documented after breakthrough cases. It hasn't occurred.

22. Dr. Crotty, in a continued half-hearted uncited attempt to deny the strength of natural immunity, makes the assertion that natural immunity "can be narrow against variants and of uncertain protective capacity." First, this statement is not cited to a single study or data. Second, it is unclear to which "variants" Dr. Crotty is referring, current ones or potential future ones, but to the extent he is talking about the Delta variant, studies cited above are clear that natural immunity is protective against Delta variant, while vaccine immunity is admittedly waning significantly.

23. Dr. Crotty also fails to address the numerous and consistent body of studies which reflect that natural immunity is superior to vaccine immunity by almost every measure. In addition to the data regarding breakthrough cases and reinfections above, the following studies further evidence the superiority of natural immunity:

a. Researchers from NYU School of Medicine studied the contrast between vaccine-induced immunity and immunity from prior infection as it relates to stimulating the innate T-cell immunity (which is more durable than

adaptive immunity) and found that natural immunity is shown to convey innate immunity, while the vaccine mainly stimulates adaptive immunity.[28]

b. Authors from Rockefeller University concluded that memory B cells in those with prior infection "express increasingly broad and potent antibodies that are resistant to mutations found in variants of concern" and that "memory antibodies selected over time by natural infection have greater potency and breadth than antibodies elicited by vaccination."[29]

c. UC's researchers conducted a study and concluded: "Natural infection induced expansion of larger CD8 T cell clones occupied distinct clusters,

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[28]Ivanova EN, Devlin JC, Buus TB, et al. Discrete immune response signature to SARS-CoV-2 mRNA vaccination versus infection. Preprint. *medRxiv*. 2021;2021.04.20.21255677. Published 2021 Apr 21. doi:10.1101/2021.04.20.21255677; https://pubmed.ncbi.nlm.nih.gov/33907755/.

[29] Alice Cho, Frauke Muecksch, Dennis Schaefer-Babajew, Zijun Wang, Shlomo Finkin, Christian Gaebler, Victor Ramos, Melissa Cipolla, Marianna Agudelo, Eva Bednarski, Justin DaSilva, Irina Shimeliovich, Juan Dizon, Mridushi Daga, Katrina Millard, Martina Turroja, Fabian Schmidt, Fengwen Zhang, Tarek Ben Tanfous, Mila Jankovic, Thiago Y. Oliveria, Anna Gazumyan, Marina Caskey, Paul D. Bieniasz, Theodora Hatziioannou, Michel C. Nussenzweig. bioRxiv 2021.07.29.454333; doi: https://doi.org/10.1101/2021.07.29.454333; https://www.biorxiv.org/content/10.1101/2021.07.29.454333v1.

likely due to the recognition of a broader set of viral epitopes presented by the virus *not seen in the mRNA vaccine*."[30]

d. Researchers from Israel and the National Cancer Institute in Maryland conducted a large-scale study of antibody titer decay following Pfizer's COVID-19 vaccine or SARS-CoV-2 infection. Aside from more robust T cell and memory B cell immunity, Israeli researchers found that antibodies wane slower among those who were previously infected. "In vaccinated subjects, antibody titers decreased by up to 40% each subsequent month while in convalescents they decreased by less than 5% per month."[31]

e. A Washington University School of Medicine study wrote, "People who recover [even] from mild COVID-19 have bone-marrow cells that can

[30] Single cell profiling of T and B cell repertoires following SARS-CoV-2 mRNA vaccine. Suhas Sureshchandra, Sloan A. Lewis, Brianna Doratt, Allen Jankeel, Izabela Ibraim, Ilhem Messaoudi bioRxiv 2021.07.14.452381; doi: https://doi.org/10.1101/2021.07.14.452381; Single cell profiling of T and B cell repertoires following SARS-CoV-2 mRNA vaccine Suhas Sureshchandra, Sloan A. Lewis, Brianna Doratt, Allen Jankeel, Izabela Ibraim, Ilhem Messaoudi bioRxiv 2021.07.14.452381; doi: https://doi.org/10.1101/2021.07.14.452381; https://www.biorxiv.org/content/10.1101/2021.07.14.452381v1 (emphasis added).

[31] Large-scale study of antibody titer decay following BNT162b2 mRNA vaccine or SARS-CoV-2 infection. Ariel Israel, Yotam Shenhar, Ilan Green, Eugene Merzon, Avivit Golan-Cohen, Alejandro A Schäffer, Eytan Ruppin, Shlomo Vinker, Eli Magen medRxiv 2021.08.19.21262111; doi: https://doi.org/10.1101/2021.08.19.21262111; https://www.medrxiv.org/content/10.1101/2021.08.19.21262111v1.

churn out antibodies for decades." Thus, prior COVID-19 infection creates memory B cells that "patrol the blood for reinfection, while bone marrow plasma cells (BMPCs) hide away in bones, trickling out antibodies for decades" as needed.[32]

f. A Korean study found that the T cells created from those patients previously infected with COVID-19 had "stem-cell like" qualities and, after studying SARS-CoV-2-specific memory T cells in previously infected patients who had varying degrees of severity of disease, the authors concluded that long-term "SARS-CoV-2-specific T cell memory is successfully maintained regardless of the severity of COVID-19."[33]

g. Researchers from Emory and Vaccine and Infection Disease Division of Fred Hutchinson Cancer Research Center found that most previously infected patients produced durable antibodies, memory B cells, and durable polyfunctional CD4 and CD8 T cells, which target multiple parts

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[32] SARS-CoV-2 infection induces long-lived bone marrow plasma cells in humans; Jackson S. Turner, et al. Nature; 24 May, 2021; https://www.nature.com/articles/s41586-021-03647-4.

[33] Jung JH, Rha MS, Sa M, Choi HK, Jeon JH, Seok H, Park DW, Park SH, Jeong HW, Choi WS, Shin EC. SARS-CoV-2-specific T cell memory is sustained in COVID-19 convalescent patients for 10 months with successful development of stem cell-like memory T cells. Nat Commun. 2021 Jun 30;12(1):4043. doi: 10.1038/s41467-021-24377-1. PMID: 34193870; PMCID: PMC8245549. https://pubmed.ncbi.nlm.nih.gov/34193870/.

of SARS-CoV-2, concluding that: "Taken together, these results suggest that broad and effective immunity may persist long-term in recovered COVID-19 patients."[34]

24. The superiority of natural immunity is not just reflected by measurements of T cells and B cells, but by the real-world data comparing the outcomes of the naturally immune to the vaccine immune, as described, *supra*, in the "Breakthrough Cases vs. Reinfection" section.

25. Dr. Crotty's only data or study that he cites to contradict any of the foregoing is a single study from the UK which he says reflects that "mRNA COVID-19 vaccine immunity was somewhat better than natural immunity." Crotty Dec. ¶ 49. However, this study was meant to assess the effectiveness of the Pfizer, Moderna, and AstraZeneca vaccines against new SARS-CoV-2 PCR-positive tests (not against natural immunity) and states that "**Effectiveness of two doses remains at least as great as protection afforded by prior natural infection.**"[35] This is not evidence justifying vaccination of those protected by prior natural infection nor does it support his claim that vaccine immunity is somehow "better" than vaccine immunity, and of course, fails to account to the now reams of studies, only a fraction of which are detailed above, reflecting that natural immunity is more durable, robust and effective than vaccine immunity.

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[34] https://www.cell.com/cell-reports-medicine/fulltext/S2666-3791(21)00203-2#%20.

[35] https://www.medrxiv.org/content/10.1101/2021.08.18.21262237v1.full.pdf.

26. It is also ridiculous to rely on this study – which shows that reinfections are exceedingly rare – to say it's better than natural immunity because the UK data proved natural immunity is extremely robust. Again, UK's COVID-19 data shows a **probable reinfection rate** of **0.025%** through August 19, 2021 and during Delta[36] and, by contrast, a **vaccine breakthrough rate** for Delta infections of **23%**.[37] Hence, not only does Dr Crotty ignore virtually all the epidemiological data, he ignores all direct studies regarding the superior immunity generated by natural immunity.

IV. Hybrid Immunity

27. Unable to contradict the core facts reflecting that natural immunity is superior to vaccine immunity by every measure, Dr. Crotty distracts with an incorrect comparison of individuals with natural immunity and those with natural immunity who have been vaccinated ("hybrid immunity"). Crotty Dec. ¶¶ 25-26. Dr. Crotty claims that hybrid immunity is better than natural immunity. Even if Dr. Crotty is correct, which is not supported by the data and studies, it is irrelevant. Natural immunity alone provides sterilizing immunity while vaccine immunity does not provide sterilizing immunity, and as for preventing symptomatic cases, natural immunity is greater than 99% efficacious

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[36] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1012240/Weekly_Flu_and_COVID-19_report_w33.pdf at 17-18.

[37] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1014926/Technical_Briefing_22_21_09_02.pdf at 21.

against COVID-19, regardless of variants, and does not wane at nearly the rate vaccine-induced immunity wanes.

28. Nonetheless, Dr. Crotty seeks to support his opinion by pointing to studies he claims support that vaccinating the naturally immune offers better protection. The primary study he and Dr. Reingold cite is a Kentucky study comparing natural immunity to immunity after infection and subsequent vaccination. Crotty Dec. ¶ 44. Putting aside that this study does not compare the naturally immune to those with just vaccine immunity, this study has severe flaws, including the fact that the researchers re-engineered the controls in this study and chose, after the fact, those who had not been re-infected. The study itself lists five critical limitations, two of the most notable are that "reinfection was not confirmed through whole genome sequencing, which would be necessary to definitively prove that the reinfection was caused from a distinct virus relative to the first infection" and that "persons who have been vaccinated are possibly less likely to get tested. Therefore, the association of reinfection and lack of vaccination might be overestimated." This study cannot be used to reach the conclusion that Dr. Crotty reaches and is, in any event, irrelevant. Crotty Dec. ¶ 44. Even if true, the naturally immune already have sterilizing immunity and a negligible rate of reinfection. This immunity alone is superior to vaccine immunity and hence it is irrational to apply limitations to the naturally immune but not the vaccine immune.

29. In any event, Dr. Crotty fails to recognize the numerous studies that have demonstrated that natural immunity is stunted by subsequent vaccination or, at best, adds no additional protection. Notably, U.S. researchers from Case Western Reserve University School of Medicine, Ragon Institute of MGH, MIT and Harvard, and other institutes looked at humoral immunity from 2 weeks to 6 months post-vaccination in 120 nursing home residents and 92 ambulatory healthcare worker controls both with and without pre-vaccination SARS-CoV-2 infection. The authors noted that, "[a]ntispike, anti-RBD and neutralization levels dropped more than 84% over 6 months' time in all groups *irrespective of prior SARS-CoV-2 infection*." In a previously infected individual with natural immunity who does not get vaccinated, these levels do not drop off. In fact, these levels persist and even grow.[38] The fact that they drop following vaccination is an indication that vaccination is having an adverse effect on naturally induced immunity.[39]

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[38] Moriyama S, Adachi Y, Sato T, Tonouchi K, Sun L, Fukushi S, Yamada S, Kinoshita H, Nojima K, Kanno T, Tobiume M, Ishijima K, Kuroda Y, Park ES, Onodera T, Matsumura T, Takano T, Terahara K, Isogawa M, Nishiyama A, Kawana-Tachikawa A, Shinkai M, Tachikawa N, Nakamura S, Okai T, Okuma K, Matano T, Fujimoto T, Maeda K, Ohnishi M, Wakita T, Suzuki T, Takahashi Y. Temporal maturation of neutralizing antibodies in COVID-19 convalescent individuals improves potency and breadth to circulating SARS-CoV-2 variants. Immunity. 2021 Aug 10;54(8):1841-1852.e4. doi: 10.1016/j.immuni.2021.06.015. Epub 2021 Jul 2. PMID: 34246326; PMCID: PMC8249673; https://pubmed.ncbi.nlm.nih.gov/34246326/.

[39] https://www.biorxiv.org/content/10.1101/2021.03.22.436441v1 (Researchers monitored a group of vaccinated people with and without prior infection and found that "in individuals with a pre-existing immunity against SARS-CoV-2, the second vaccine dose not only fail to boost humoral immunity but determines a contraction of the spike-specific T cell response." They also note that "the second vaccination does appears to exert a detrimental effect in the overall magnitude of the spike-specific humoral response

In other words, the normal, longstanding, robust immunity which does not typically show significant waning and, in fact shows increasing potency of antibodies, in those recovered is dropping 84% after vaccination.

V. Concerns About Harms Associated with the Vaccine

30. Dr. Crotty attacks VAERS, the CDC and FDA's primary post-authorization and post-marketing vaccine safety surveillance system, which it relies upon to make many of its claims regarding vaccine safety. Despite this, Dr. Crotty states that "VAERS has been rendered almost useless." Crotty Dec. ¶ 34. At the same time, Dr. Byington states that "VAERS can provide CDC and FDA with valuable information" (Byington Dec. ¶ 36) and Dr. Reingold describes VAERS as an "important component of the U.S. system for monitoring and evaluating the safety of vaccines (Reingold Dec. ¶ 17). Defendants cannot have it both ways – either VAERS is valuable and important, or it is useless -- if it can be used to make claims to support vaccine safety, then it must also be able to be used to make claims that vaccines are unsafe.

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in COVID-19 recovered individuals."); https://www.biorxiv.org/content/10.1101/2021.05.12.443888v1 (Researchers assessed those vaccinated who were naïve to COVID-19 and those vaccinated who had recovered (and did not assess those who recovered but were not vaccinated) concluded that, "[i]n infection-naïve individuals, the second dose boosted the quantity but not quality of the T cell response, while in convalescents the second dose helped neither. Spike-specific T cells from convalescent vaccinees differed strikingly from those of infection-naïve vaccinees, with phenotypic features suggesting superior long-term persistence and ability to home to the respiratory tract including the nasopharynx.").

31. Dr. Crotty says, "VAERS is an open system, to which anyone can report adverse events, including false or fake adverse events," but ignores the fact that 83% of VAERS reports come from vaccine manufacturers, health care providers and state immunization programs.[40] As Dr. Byington noted, "[h]ealthcare professionals are required to report certain adverse events and vaccine manufacturers are required to report all adverse events that come to their attention." Byington Dec. ¶ 35.

32. Dr. Reingold, in touting the vaccines' alleged safety, states that "there is a very small risk of a severe allergic reaction (i.e., anaphylaxis) in the 15 to 30 minutes following" vaccination. Reingold Dec. ¶ 18. As explained in our prior declaration in this case, less than 1% of adverse events after vaccination are reported to VAERS. Dr. Reingold claim that anaphylaxis after COVID-19 vaccination presents a "very small risk" drives home this point. While it is true that VAERS data reflects 2 to 5 cases of anaphylaxis per million COVID-19 vaccinated Americans, a study at Mass General Brigham assessed anaphylaxis in a clinical setting after the administration of COVID-19 vaccines found "severe reactions consistent with anaphylaxis occurred at a rate of 2.47 per 10,000 vaccinations."[41] This is equivalent to 50 times to 120 times more cases than what VAERS and the CDC are reporting.

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[40] https://www.fda.gov/media/93840/download at 6.

[41] https://jamanetwork.com/journals/jama/fullarticle/2777417.

33. Defendants nonetheless argue that the COVID-19 vaccines "have impressive safety records" (Crotty Dec. ¶ 9), are "safe and effective" (Byington Dec. ¶ 24) and are "very safe" (Reingold Dec. ¶ 18). The only sources Defendants cite to as justification for this determination are the clinical trials conducted by the pharmaceutical companies for their own products. Defendants ignore all independent studies conducted by individuals without this plain conflict of interest. For example, Defendants do not address the numerous studies that raise concern about the safety of spike proteins, or the paper published by Bruno et al. which highlights the high number of reported serious adverse events following COVID-19 vaccination. Dkt. No. 15-4 at ¶¶ 28-29.

VI. Conclusion

34. Dr. Bolden-Albada and Dr. Byington declare that the research and underlying data regarding any infection-induced immunity today for individuals who had COVID-19 previously is too preliminary to justify permitting individuals in this group to unilaterally opt out of the COVID-19 vaccine and put the greater UC community at risk." (Declaration of Bolden-Albada, "B-A Dec.", ¶ 6; Byington Dec. ¶ 30.) Putting aside that they do not cite a single study or datapoint to support this claim, if this statement is true despite all of the available science as provided for in our declarations, then the same must be true for COVID-19 vaccinations.

35. Naturally immune individuals have been around for longer and studied for longer than those who have received vaccines, indeed, from the very beginning of this

pandemic. Therefore, if the data available is too preliminary to support the immunity of those who have recovered, then the data justifying COVID-19 vaccine immunity must all be too preliminary to mandate the vaccines.

36. Based on the foregoing, we reiterate our conclusion that those who have been infected with SARS-CoV-2 are at least as protected as those vaccinated for COVID-19, are less likely to spread SARS-CoV-2 to others and will be exposed to the potential harm from this vaccine without a counterbalancing benefit because they are already immune to the virus.

VII. Qualifications

37. In response to the suggestion by Defendants that we are not qualified to opine on the data within our original declaration, we note as follows:

38. Document 21.1 on page 6 incorrectly states that Aditi Bhargava is a reproductive scientist. She is not. Dr. Bhargava is a trained Molecular Biologist, with her PHD thesis on proto-oncogenes of the *src* family. She has published extensively in areas encompassing physiology, endocrinology, Cell biology, immunology, neuroscience, renal diseases, diabetes, gastrointestinal diseases, gut-brain axis, PTSD, sex differences, and more.

39. Dr. Bhargava developed a PCR-based diagnostic kit for mycobacterium in 1990 in India while she was pre-graduate student (published in Lancet). She worked on human papilloma virus and has worked with virus-based vectors in the lab.

40. UCSF had filed a patent on Dr. Bhargava's behalf for RNA technology and delivery platform using nanoparticle encapsulation. Dr. Bhargava understands the science behind these vaccines. She has performed PK and biodistribution studies. Her expertise includes the knowledge necessary to design mRNA-based vaccines.

41. Dr. Bhargava has submitted several grants on COVID-19 (intramural to UCOP and within UCSF, and extramural to NIH) and has been asked to review several manuscripts in the area of COVID-19, making her an expert to judge those publications.

42. Additionally, Dr. Bhargava has given several talks and webinars on COVID-19, explaining the science behind SARS-CoV-2 to the public.

43. Carole H. Browner Ph.D. M.P.H. has decades of public health research and teaching experience in the U.S., Latin America, and Europe. A principal research focus has been on medical decision-making, mainly in reproduction and neurology, in diverse populations of patients, family members, and clinicians.

44. Dr. Ladapo has sufficient expertise to evaluate the risks and benefits of the COVID-19 vaccine mandate policy. He is a nationally recognized expert in health policy evaluation and quantitative decision sciences. During his PhD in Health Policy program at Harvard University, he received training in epidemiology. During medical school at Harvard University, he received training in immunology and infectious diseases.

45. Dr. Ladapo has also served as the attending physician for patients hospitalized with COVID-19 at UCLA Ronald Reagan Hospital since March 2020

through August 2021. Because this mandate bridges immunology, epidemiology, and decision sciences, Dr. Ladapo has a unique, expert perspective that allows him to comprehensively evaluate its risks and benefits.

46. Gabriel Vorobiof, MD, FACC, FASE is a clinical cardiovascular clinician specializing in advanced cardiovascular imaging. He trained in Internal Medicine at the St. Luke's Roosevelt Hospital of Columbia University College of Physicians & Surgeons, followed by Cardiovascular Medicine & Chief Fellowships at the University of Rochester Medical Center and an Advanced Cardiovascular Imaging Fellowship at the Brigham & Women's Hospital of Harvard Medical School. He currently holds the title of Director, Non-Invasive Cardiology Laboratories at the Ronald Reagan Medical Center, and is an Associate Clinical Professor of Medicine (Division of Cardiology), as well as secondary appointment as Associate Clinical Professor in the Department of Molecular and Medical Pharmacology at the David Geffen School of Medicine at UCLA in Los Angeles, CA.

47. All of us are accomplished academic clinicians and scientists and should be considered expert witnesses because we all possess the ability, by virtue of the respective medical training, to cite clinical studies, interpret data, and opine based on clinical experience.

48. Dr. Whelan's PhD is in Microbiology & Immunology, with a focus on immunodeficiency diseases, thus highly relevant to discussions about immune responsiveness to vaccination. He has been teaching a virology course at USC/Keck

School of Medicine for ten years, and has been involved in direct patient care of both children and adults with Covid-19 and the multisystem inflammatory syndrome in children.

49. The idea that none of us are experts in COVID-19 or vaccines or public health policy is an extremely narrow construal of expertise, effectively excluding all academic physicians and academic medical social scientists with appointments in a school of medicine. This narrow definition and misclassification of witnesses should therefore also apply to all of the University of California experts.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct this 13 day of September 2021, at 4 pm, _____.

Joseph Ladapo, MD, PhD
Center for HIV Identification, Prevention, and Treatment Services, UCLA; Associate Professor with Tenure, Division of General Internal Medicine/Health Services Research, Department of Medicine, David Geffen School of Medicine at UCLA

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct this 13th day of September 2021, at Los Angeles, California.

John Patrick Whelan, MD, PhD
Clinical Associate Professor of Molecular Microbiology & Immunology, Keck/USC;
Clinical Associate Professor of Pediatrics, David Geffen School of Medicine, UCLA

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct this 13th day of September 2021, at San Miguel de Allende, Mexico.

Carole Browner, PhD, MPH
Distinguished Research Professor, Professor Emerita, Departments of Psychiatry, Anthropology, and Gender Studies, UCLA

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct this _14__day of September 2021, at _Noida___, __India___.

Dated: ___09/14/2021_____ _____

Aditi Bhargava, PhD

Professor Emerita, Department of Ob-Gyn,

Center for Reproductive Sciences, UCSF

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct this 13th day of September 2021, at Los Angeles, California.

Dated: 09/13/2021

Gabriel Vorobiof, M.D.
Health Sciences Associate Clinical Professor of Medicine, Division of Cardiology and the Department of Molecular & Medical Pharmacology, UCLA