

# PhysiciansCommittee

for Responsible Medicine

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September 20, 2023

Gurbir S. Grewal  
Director, Division of Enforcement  
U.S. Securities and Exchange Commission  
100 F St. NE  
Washington, DC 20549

Nicole Creola Kelly  
Chief, Office of the Whistleblower  
U.S. Securities and Exchange Commission  
14420 Albemarle Point Pl., Suite 102  
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*Submitted via email (enforcement@sec.gov and chair@sec.gov) and fax (703-813-9322)*

**RE: Request for Investigation of Neuralink Corp. and Its Chief Executive Officer Elon Musk for Securities Fraud**

Dear Mr. Grewal and Ms. Kelly:

On behalf of the Physicians Committee for Responsible Medicine, our 17,000 doctor members, and our 900,000 supporters, we are writing to request that the U.S. Securities and Exchange Commission (“SEC”) investigate the medical device company Neuralink Corp. (Central Index Key # 0001708503) and its chief executive officer Elon Musk for securities fraud and penalize them accordingly.

Neuralink’s Form D notice dated Aug. 8, 2023, categorizes Mr. Musk as “Executive Officer.”<sup>1</sup> A “Statement of Information” filed by the company with the California Secretary of State on June 29, 2023, identifies Mr. Musk as “Chief Executive Officer.”<sup>2</sup> Mr. Musk is also widely recognized as Neuralink’s owner.

On Sept. 10, 2023, Musk responded to animal welfare concerns at Neuralink via a post on the social media platform X, which he also owns. He wrote:

“No monkey has died as a result of a Neuralink implant.

First our early implants, to minimize risk to healthy monkeys, we chose terminal mon[k]eys (close to death already)[.]”<sup>3</sup>

Musk knows that to be false. Public records obtained by the Physicians Committee reveal that at least 12 young, previously healthy monkeys were euthanized by Neuralink as a direct result of problems with the company’s implant.<sup>4</sup>

The animals’ deaths and the reasons for their deaths relate directly to the safety and marketability of the brain-computer interface Neuralink is developing, and thus it is critical that the company provide investors with factually accurate information.

<sup>1</sup> [https://www.sec.gov/Archives/edgar/data/1708503/000170850323000001/xslFormDX01/primary\\_doc.xml](https://www.sec.gov/Archives/edgar/data/1708503/000170850323000001/xslFormDX01/primary_doc.xml)

<sup>2</sup> <https://bizfileonline.sos.ca.gov/api/report/GetImageByNum/144188149157121159169055130193118019089057165152>

<sup>3</sup> <https://twitter.com/elonmusk/status/1700825786326896950>

<sup>4</sup> <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

Musk has 156.4 million followers on X, the most of any account on the platform, meaning the reach of his messages is immense and affects the perception of Neuralink by the general public and potential investors. His Sept. 10 post had already received more than 717,000 views as of the time of this filing. In its 2018 complaint against Musk for posting misleading messages on what was then known as Twitter, SEC referenced his 22 million followers at the time, emphasizing the reach of his social media account: “His tweets were published instantaneously to those people and were also publicly available to anyone with Internet access.”<sup>5</sup> The complaint also used a reply by Musk on Twitter to support its claim of illegal behavior.<sup>6</sup>

At the time of SEC’s 2018 complaint, Steven Peikin, Co-Director of the SEC’s Enforcement Division stated: “Corporate officers hold positions of trust in our markets and have important responsibilities to shareholders.”<sup>7</sup> He continued: “An officer’s celebrity status or reputation as a technological innovator does not give license to take those responsibilities lightly.”<sup>8</sup>

Stephanie Avakian, Co-Director of the SEC’s Enforcement Division, added: “Taking care to provide truthful and accurate information is among a CEO’s most critical obligations.”<sup>9</sup> She concluded: “That standard applies with equal force when the communications are made via social media or another non-traditional form.”<sup>10</sup>

This effort by Musk appears to be a violation of SEC Rule § 240.10b-5,<sup>11</sup> which states as follows:

“It shall be unlawful for any person, directly or indirectly, by the use of any means or instrumentality of interstate commerce, or of the mails or of any facility of any national securities exchange...[t]o make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading...in connection with the purchase or sale of any security.”

In its August 2023 Form D notice, Neuralink claimed to have raised \$280,274,981 in investments, with a minimum investment accepted from any outside investor of \$14,995.<sup>12</sup> Given the scale of these investments, it is crucial that SEC investigate this matter and hold Musk and Neuralink accountable—especially given Musk’s history of misleading investors.<sup>13</sup> In addition, Neuralink came under scrutiny in 2022 for potentially misleading SEC about Musk’s leadership role at the company.<sup>14</sup>

## 1. Background

Since 2016, Neuralink has conducted experiments in animals with the intention of developing an implantable brain-computer interface. Between May 2017 and December 2020, employees performed invasive, exploratory brain studies on rhesus macaques at the University of California, Davis (“UC Davis”). During most of the experiments, Neuralink employees drilled two dime-sized holes in the

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<sup>5</sup> <https://www.sec.gov/files/litigation/complaints/2018/comp-pr2018-219.pdf>

<sup>6</sup> Ibid.

<sup>7</sup> <https://www.sec.gov/news/press-release/2018-219>

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> 17 C.F.R. § 240.10b-5(b).

<sup>12</sup> [https://www.sec.gov/Archives/edgar/data/1708503/000170850323000001/xslFormDX01/primary\\_doc.xml](https://www.sec.gov/Archives/edgar/data/1708503/000170850323000001/xslFormDX01/primary_doc.xml)

<sup>13</sup> <https://www.sec.gov/news/press-release/2018-226>

<sup>14</sup> <https://fortune.com/2022/02/04/elon-musk-startup-neuralink-may-have-misled-regulators/>

animals' heads, implanted electrodes in their brains, and attached titanium plates to their skulls using bone screws.

In 2021, as a result of a California Public Records Act lawsuit against UC Davis, the Physicians Committee obtained veterinary records from Neuralink's experiments. These records show that Musk's claim on Sept. 10 is materially untrue.

## 2. Monkeys Died as a Result of the Neuralink Implant

Records from UC Davis show that implantation of the Neuralink device caused debilitating health effects in monkeys, which led to euthanasia. These include the following:

- chronic infections
- swelling in the brain
- “remnant electrode threads” from the device found in brain
- “tattered” cerebral cortex
- paralysis
- seizures
- loss of coordination and balance
- depression

Below are four examples of previously healthy monkeys who died due to their use in experiments by Neuralink. Complete records of all monkeys used can be found on the Physicians Committee's website.<sup>15</sup>

“**Animal 20**” was a male rhesus macaque who was 7 years old when Neuralink employees put him under the knife for the first time in December 2019 during 9-hour “[e]xperimental” surgery.<sup>16</sup> They made an incision along the side of his head, cut and “elevated” the underlying muscle, drilled two dime-sized holes in his skull, and inserted electrodes attached to implants into his brain. The exposed portions of the implants were referred to as “pill boxes” and were “secured in place with up to 20 blunt-tipped screws.” Those pill boxes were connected to a cable and port under his skin that were secured with more bone screws. Immediately, it was clear that something had gone wrong during the surgery. A handwritten note by laboratory staff stated that both front (“rostral”) and back (“caudal”) feet of the implant “broke off of [e]xternal connector base.”<sup>17</sup> Laboratory staff observed Animal 20 “pulling on port connector which is now dislodged (no longer secured).”<sup>18</sup> One day after the first surgery, Neuralink staff subjected Animal 20 to another surgery to fix their mistake.<sup>19</sup> They found that the implanted device was “free of its bony anchors” and had “sharp edges.”<sup>20</sup> Soon thereafter, laboratory staff found antibiotic resistant *Escherichia coli* and *Candida glabrata*, a fungal infection, at the surgical site.<sup>21</sup> They euthanized Animal 20.<sup>22</sup>

“**Animal 11**” was a female rhesus macaque who was 10 years old in December 2018 when Neuralink employees drilled holes in her skull and implanted electrodes in her brain using “investigational robotics.”<sup>23</sup> Following the six-hour surgery, Neuralink affixed a titanium plate to her head with bone

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<sup>15</sup> <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>16</sup> “Animal 20” page 39. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>17</sup> “Animal 20” page 16. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>18</sup> “Animal 20” page 15. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>19</sup> “Animal 20” page 36. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>20</sup> Ibid.

<sup>21</sup> “Animal 20” page 5. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>22</sup> Ibid.

<sup>23</sup> “Animal 11” page 38. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

screws and sealed the holes with “gelfoam.”<sup>24</sup> Almost immediately, lab staff noted that the implants became infected and the “skin was eroded.”<sup>25</sup> A microbial analysis showed that she was suffering from a Staphylococcus infection.<sup>26</sup> Staff noted that the “skin appears pierced from implant.”<sup>27</sup> In March 2019, they sedated Animal 11 and attempted to clean the bloody, infected implants in her head.<sup>28</sup> They were able to “express” some of the “purulence” but not all of it.<sup>29</sup> One week later, staff noted that the infection in her implants was persisting.<sup>30</sup> A few days later, they euthanized Animal 11.<sup>31</sup>

“**Animal 15**” was a female rhesus macaque who was about 6 years old when she was selected for the Neuralink experiment in September 2017. Company employees performed surgery on her in December 2018.<sup>32</sup> Almost immediately after the surgery, she began pulling and picking at the implant in her head.<sup>33</sup> Laboratory staff noted that the area became bloody.<sup>34</sup> They also observed her lying down and possibly “head pressing,”<sup>35</sup> which can be a symptom of neurological impairment, pain, and/or infection. In a 10-minute period, staff observed her in “position w/head down on floor multiple times.”<sup>36</sup> Staff noted that she “shook her head 3 times and lost her balance, twice completely falling, writing that Animal 15 “[a]ppears ataxic,”<sup>37</sup> meaning she had lost coordination and balance. Staff wrote that the ataxia could have been due to “intracranial swelling” from the implanted device.<sup>38</sup> Because of “pulling on implant repeatedly” and other signs of anxiety and discomfort, the staff started Animal 15 on diazepam (Valium).<sup>39</sup> They continued to observe “excoriations” (from repeated picking) on her face, shoulder, and neck.<sup>40</sup> Shortly, thereafter, staff wrote that her “face and back of head” were swollen, with her right eye “swollen halfway shut,” and they observed her shaking.<sup>41</sup> On Dec. 25, 2018, staff noted that both of her eyes were now swollen half-shut and her right cheek appeared “more swollen than” the day before.<sup>42</sup> The next day, they raised concerns “regarding a [cranial] screw in or near a muscle causing potential irritation.”<sup>43</sup> In March 2019, lab tests confirmed the implant was positive for Staphylococcus and another bacterial infection.<sup>44</sup> Almost two weeks later, staff euthanized Animal 15,<sup>45</sup> and the necropsy report indicated that her cerebral cortex was “focally tattered” and staff found internal bleeding and “remnant electrode threads” in her brain.<sup>46</sup>

“**Animal 22**” was a male rhesus macaque who was 6 years old when he was transferred to the Neuralink experiment. In January 2020, Neuralink employees subjected him to a seven-hour surgery.<sup>47</sup> One week

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<sup>24</sup> Ibid.

<sup>25</sup> “Animal 11” page 17. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>26</sup> “Animal 11” page 26. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>27</sup> “Animal 11” page 15. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>28</sup> “Animal 11” page 4. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>29</sup> Ibid.

<sup>30</sup> “Animal 11” page 2. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>31</sup> “Animal 11” page 44. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>32</sup> “Animal 15” page 6. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>33</sup> “Animal 15” page 30. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>34</sup> Ibid.

<sup>35</sup> “Animal 15” page 29. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>36</sup> Ibid.

<sup>37</sup> “Animal 15” page 28. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>38</sup> Ibid.

<sup>39</sup> “Animal 15” page 26. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>40</sup> Ibid.

<sup>41</sup> “Animal 15” page 25. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>42</sup> “Animal 15” page 24. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>43</sup> Ibid.

<sup>44</sup> “Animal 15” page 1. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>45</sup> “Animal 15” page 37. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>46</sup> Ibid.

<sup>47</sup> “Animal 22” page 10. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

later, laboratory staff noted that “there is a ‘crepitus like’ sensation” near the implanted port,<sup>48</sup> meaning a crackling or popping sound that occurs as a result of tissues rubbing together abnormally. Two months after the surgery, staff noted that the implant, which was screwed into Animal 22’s skull, was “loose today”<sup>49</sup> and that it moved when “minimal pressure” was applied.<sup>50</sup> They euthanized him.<sup>51</sup> The necropsy report noted that two screws “attaching the implant to the skull were loose and could easily be lifted out” and “the implant could be easily pivoted...”<sup>52</sup> The report also stated that the “failure of this implant” was “purely mechanical.”<sup>53</sup>

It was likely the troubling results of the monkey experiments that led the U.S. Food and Drug Administration (“FDA”) in 2022 to reject Neuralink’s initial request to begin human clinical trials.<sup>54</sup> The FDA “raised safety concerns” related to the “device’s lithium battery; the potential for the implant’s tiny wires to migrate to other areas of the brain; and questions over whether and how the device can be removed without damaging brain tissue”—many of the same issues seen in the monkey experiments described above. While the agency eventually granted approval for the company to begin a human trial,<sup>55</sup> unconfirmed reports suggest FDA only gave permission for one participant in the trial, underlining the safety concerns.

It is against the backdrop of reports of FDA scrutiny that Musk made his claim on Sept. 10. Numerous companies are competing to bring brain-computer interfaces to the market and court investors,<sup>56</sup> with many companies focused on creating a device that is minimally invasive or noninvasive. Yet Neuralink’s device is one of the most invasive in development. Since devices implanted in the brain come with a myriad of potential problems, including difficulty of repair and a high potential for severe medical complications, Musk appears to be arguing Neuralink’s device is safe by making false claims about past studies.

### **3. Monkeys Experimented Upon Were Not Already Close to Death**

Monkey health records show that, while several animals had suffered physical trauma and been used previously in experiments at UC Davis, there is no evidence that they were “close to death,” as Musk stated. Rhesus macaques often live to about 25 years in captivity,<sup>57</sup> with some living to 40.<sup>58</sup> But the average age of the 12 monkeys killed by Neuralink was 7.25 years when they were moved to the company’s experimental protocol,<sup>59</sup> and 10 of them were younger than 8 years old, meaning they had not yet reached adulthood.<sup>60</sup>

### **4. Request for Investigation and Enforcement**

Records show that Neuralink’s device was the direct cause of medical complications and deaths of at least 12 monkeys. This information is critical for investors to understand the safety and thus the marketability

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<sup>48</sup> “Animal 22” page 28. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>49</sup> “Animal 22” page 20. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>50</sup> “Animal 22” page 19. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>51</sup> “Animal 22” page 47. <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>52</sup> Ibid.

<sup>53</sup> Ibid.

<sup>54</sup> <https://www.reuters.com/investigates/special-report/neuralink-musk-fda>

<sup>55</sup> <https://www.reuters.com/science/elon-musks-neuralink-gets-us-fda-approval-human-clinical-study-brain-implants-2023-05-25/>

<sup>56</sup> <https://www.investorobserver.com/news/qm-pr/4609917843277551>

<sup>57</sup> Chiou et al. (2020). *Rhesus macaques as a tractable physiological model of human ageing*. *Philos Trans R Soc Lond B Biol Sci*. Nov 9; 375(1811).

<sup>58</sup> Ibid.

<sup>59</sup> <https://www.pcrm.org/ethical-science/animals-in-medical-research/original-records-neuralink>

<sup>60</sup> Ibid.

of the company's brain-computer interface. Therefore, Elon Musk's efforts to mislead investors about the development history and safety of the device must be investigated.

We urge your agency to investigate this matter and penalize Neuralink and Musk appropriately.

Thank you for considering this request. Please contact us if we can be of further assistance.

Sincerely,



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