



## Editorial



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# Conducting Research During the COVID-19 Pandemic: How Scientific Community Should be Prepared?

A plague caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus that began in late 2019 has swept the globe at an unprecedented rate, infecting near 2.4 million people with more than 16,000 lives lost in over 200 countries and territories as of April 21st, 2020.<sup>1</sup> Behind the digits is the endless grief of countless families. The coronavirus disease 2019 (COVID-19) pandemic is the greatest global crisis in new millennium, and we humanity as a whole deserve to join forces to confront this life-threatening crisis from every aspect. Whether you are willing or coerced, you do and will continue to play a role in this crisis era. For scientists and researchers, the systematic training we receive may endow us a unique role during this crisis. Like in the all public health threats, scientists have high expectations to bring treatments and resorts to prevent transmission, cure disease, relief pain, and heal mental wounds.

More than ever, the scientific community needs solidarity. Scientists should have a greater consensus than the public that, globalization has enabled us from various countries and regions to fully break through geographical constraints and achieve high efficiency cooperation without borders. With the rapid development of the Internet and international logistics, we have established a practical framework for sharing information, resources, materials, and research results. Within the framework of a number of international organizations, academic associations, philanthropic foundations and so on, we have achieved to establish collaborative teams which gather international experts to tackle the global burden of diseases. With the established framework, when facing enormous public health challenge, the scientific community needs to unite in developing of methodology for prevention and control of COVID-19 transmission, investigating of etiology, pathology, and prognosis, reducing of the number of severe cases and fatality rate, preventing of various types of physiological disorders, and developing of effective drugs, targeted treatments and vaccines. In addition, the scientific community has a greater responsibility and obligation to fight against rumors, stigmatization and incitement to terror along with the pandemic. In fear of the unknown, the public are more vulnerable to incorrect information during the crisis. The professional training and mission to seek the truth encourage the scientific community in the front line fighting against nonfacts. In particular, the scientific community has a responsibility to stand together to fight resolutely against the immoral manipulation of the public during the pandemic.

The scientific community should have more strict self-discipline to maintain objectivity and impartiality during the pandemic. To determine the origin of SARS-CoV-2 is an urgent task during the crisis, as it is the underpinning of endeavors to restrain the source of infec-

tion, locate potential intermediate hosts, and cutoff transmission routes. Unfortunately, it is also a vulnerable issue to geopolitical influence. Our scientific community should uphold the attitude of objectivity and impartiality during research process and the subsequent peer-review process, so as to remain a scientific question as it is. We need to pay particular attention to the interpretation of our published findings by the media and politicians. If there is misinterpretation or misleading, it is our obligation to make correction in a timely manner. Furthermore, scientists and researchers should always adhere to the conflict-of-interest guidelines during the crisis era. Although the outbreak has now reached a critical stage, control, randomization, blinding methodologies should never be omitted during research conduct, and benefit of a treatment must outweigh the risk. Commercial and other conflicts of interest should be under scrutiny by strengthened peer review process. Finally, scientist and researchers need an unbiased interpretation of the findings. We should believe the facts *per se* and our interpretation of the results should never be skewed by political, religious, and cultural factors. The public respect unbiased scientific findings only because they respect the law of nature. If the scientists and researchers cannot be objective and unbiased, then the legitimacy of research activities will be compromised. This is especially true in the time of crisis.

The scientific community should be more forward-looking and imaginative about this new virus. More creative assumptions along with stringent researching and proving are needed in exploring etiology, pathogenesis, and pathophysiology, and in development of treatments and vaccine. Imagination and creativity are the powerful force for us to face unknown virus, paving the path towards better public health services. For example, while taking care of respiratory emergency is the priority, researchers were also concerned about the damage to the nervous system caused by SARS-CoV-2 infection. Neurologic manifestations, such as severe headache and transient paraplegia emerge at the early phase of infection.<sup>2</sup> Diffuse corticospinal tract signs are seemly common (67%).<sup>3</sup> Moreover, the potential impairment to the reproductive system is unignorable after viral infection. A preprint report suggests that single-cell sequencing techniques (scrRNA-seq) identified the specific expression of Angiotensin converting enzyme 2 (ACE2, a receptor for SARS-CoV-2 infection) in testicular cells, indicating that the testes may be a potential target for SARS-CoV-2 infection.<sup>4</sup> Another study shows that semen samples and testicular tissue biopsy did not seem to support that inference.<sup>5</sup> Nonetheless, alterations of sex-related hormone levels in reproductive-aged men with SARS-

CoV-2 infection may indicate a decline in gonadal function.<sup>6</sup> As we may see different point of views at the beginning, this reflects exactly the nature of research practice approaching the ultimate truth, just like Karl Popper wrote, “*Science must begin with myths, and with the criticism of myths*”. Such proactive, forward-looking studies render a new perspective on comprehensive understanding of disease and get us prepared for drug discovery, and offer important references for the decision of public health policies.

All in all, the scientific community is now taking on new challenges in the era of COVID-19 pandemic. As a group pursuing truth, we need to maintain the highest standards of research ethics during the special time, as Cicero says “*Nothing is more noble, nothing more venerable than fidelity. Faithfulness and truth are the most sacred excellences and endowments of the human mind*”. Let us join endeavors together for the entire humanity to get through this crisis.

## REFERENCES

1. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report [Internet]. Geneva (Switzerland): World Health Organization; c2020 [cited 2020 Apr 21]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>
2. Mao L, Jin H, Wang M, et al. Neurologic manifestations of hospitalized patients with coronavirus disease 2019 in Wuhan, China. *JAMA Neurol* 2020 Apr 10 [Epub]. <https://doi.org/10.1001/jamaneurol.2020.1127>.
3. Helms J, Kremer S, Merdji H, et al. Neurologic features in severe SARS-CoV-2 infection. *N Engl J Med*. 2020 Apr 15 [Epub]. <https://doi.org/10.1056/NEJMc2008597>.
4. Fan C, Li K, Ding Y, et al. ACE2 Expression in Kidney and Testis May Cause Kidney and Testis Damage After 2019-nCoV Infection. *medRxiv* 2020.02.12.20022418; doi: <https://doi.org/10.1101/2020.02.12.20022418>
5. Song C, Wang Y, Li W, et al. Detection of 2019 novel coronavirus in semen and testicular biopsy specimen of COVID-19 patients. *medRxiv* <https://doi.org/https://doi.org/10.1101/2020.03.31.20042333>.
6. Ma L, Xie W, Li D, et al. Effect of SARS-CoV-2 infection upon male gonadal function: A single center-based study. *medRxiv* <https://doi.org/https://doi.org/10.1101/2020.03.21.20037267>.



Title: Science and Charity

Artist: Pablo Picasso

Year: 1897

Science and Charity is one of the major works from Picasso's early years of training. At just 15, Picasso felt mature enough to take on large ambitious compositions as the culmination of his academic studies in Barcelona School of Fine Arts that were led by his father Jose Ruiz Picasso, who was the model for the doctor in this painting.

Science and Charity was awarded an Honorary Mention at the General Fine Arts Exhibition in Madrid in spring 1897 and the Gold Medal at the Provincial Exhibition in Malaga held afterwards. After that, Joaquin Martinez de la Vega – a painter and a friend of Picasso's father – held a glass of champagne and, letting a few drops fall on Picasso's head, baptized him a Painter. And Picasso's uncle, impressed by this wonderful achievement, sent money so that his nephew could study further in Madrid. However, despite the success, this would be Picasso's last great work in traditional academic style. He left behind the intention, fostered by his father, to shape a career based on prizes and awards, to seek his artistic path outside and beyond the academy.

More information: <https://www.pablo-ruiz-picasso.net/work-11.php>

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