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# Suggesting Treatments for COVID-19. Beware! Expectations cannot Replace Good Science

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**Sir,**

As scientists, we have to be concerned with the ease drugs are being proposed to face the COVID-19 pandemic. Recurrently, non-specialized media have created high expectations of short-term therapeutic benefits, although they are only based on results from in vitro experiments, case reports or even personal experiences. As pharmacologists, we know that such results have to be confirmed in well-conducted clinical studies that support evidence-based medicine.<sup>1</sup> Such studies involve much more pharmacology aspects than only the necessary preliminary in vitro studies, such as pharmacokinetics, the search for doses that can ensure the optimization of the risk-benefit balance and the assessment of the most appropriate time for the administration of the drug depending on the stage of the disease.

Unfortunately, such a situation sometimes is also engendered by some health professionals. As an example, we can cite the ivermectin case, a large spectrum macrocyclic lactone effective against many nematode species<sup>2</sup>, after the publication of a paper reporting its inhibitory effect on the replication of SARS-CoV-2 in cell culture.<sup>3</sup> This paper received widespread attention on human and veterinary medical websites in the USA, which often referred to ivermectin as a potential cure for coronavirus infection so that the Editor-in-Chief of the journal had to publish a caution notice.<sup>4</sup>

In Brazil, such concerns also exist. The Brazilian Society for Pharmacology and Experimental Therapeutics (<https://www.sbft.org.br/nota-sbft-sobre-covid-19/>) publicly pointed out and emphasized the need for the rigorous application of the scientific method to avoid the population feels deceived, which could generate a feeling of mistrust regarding science as a whole.

The first example of a political declaration of too early optimism regarding a drug before consistent proofs of efficacy was the case of chloroquine/hydroxychloroquine, as already discussed in this journal.<sup>1</sup> More recently, the Brazilian Minister of Sciences and Technology publicly announced the engagement of clinical trials with a cheap and available drug that could be repurposed for COVID-19 treatment. Very rapidly, the name of this drug was revealed, being nitazoxanide, a broad-spectrum anti-infective drug that has been shown to have in vitro effect on cells infected with the SARS-CoV-2 virus.<sup>5</sup> Two clinical trials with this drug have been approved by the Brazilian National Research Ethics Commission (CONEP) and registered on April, 14<sup>th</sup>.<sup>6</sup> Again, caution is necessary since translation from bench to bedside is not straightforward even more after the report that treatment with nitazoxanide did not reduce the duration of hospital stay in severe influenza-like illness.<sup>7</sup>