Basic reporting

The manuscript describes the characterization of pseudo peroxidase activity of myoglobin at different pH´s and temperatures and its comparison with other systems (copper and other hemeproteins). Moreover, the authors aim to explain the participation of polypeptide chains in this process.

It is important to mention that the reaction in question was studied previously, and the present manuscript is not used for the result description. In addition, the results are limited, and the contribution to the science is not clear. Moreover, the authors aim to explain the participation of polypeptide chains in this reaction but they did not present the evidence necessary to describe its participation.

Experimental design

The methodology section of the present manuscript has limitations and promotes poor results validation. The following are mentioned specific aspects:

- The temperature range used is not mentioned (Lines 191-192).

- What is the objective for using copper as an experimental treatment? Is it a control of this reaction?

- Line 186 730 nm?? What is the fundament to use this wavelength? Because it was not another? Is wavelength to monitor the concentration of all proteins or hydrogen peroxide decomposition?

- The method of monitoring the peroxidase activity is not clear. It aspect confers a confusing interpretation of results.

- Is the oxidative state of Mb important for replicating the peroxide activity? The state oxidation is fundamental to the reactivity of Mb, exist different examples of this aspect in the literature.

-The method section does not present the literature necessary to support its use.

-it is not clear how obtain experimentally the evidence for confirm the participation of polypeptide chains in this reaction.

Validity of the findings

In general, the findings contemplated by authors are necessary to use different methods that are not employed. The principal's comments to respect are described:

-The sentence “Copper (II) ion (Cu2+) as a catalyst for the ABTS peroxide reaction was not found in the literature by this lab” is confusing. In this sense, the Cu ions in the ABTS-H2O2 system are used to determine glucose detection. doi:10.1088/1742-6596/1676/1/012126.

- The methodology for obtaining the structural differences between the myoglobin structures to different pH´s described in Fig. 5, is not clear. However, an in silico strategy for determining these structural changes is for molecular dynamic simulation. Moreover, this is a modular part of this research, and the authors do not present evidence for this.

-The discussion of results is limited, and the apport science is not clear. Moreover, the literature on the characterization of myoglobin peroxidase activity is diverse.

-It is necessary to mention the state of myoglobin oxidation during the reaction. This is fundamental to better describe the mechanism involved. In this sense, metmyoglobin is well described as the reaction with hydrogen peroxide, with ferrylmyoglobin as the reaction product.

-It is recommended to focus on the characterization of spectral changes, principally for the Soret band from myoglobin, to obtain major structural evidence during the reaction, especially about the heme cavity.