Review of: "Effects of the SARS-CoV-2 Spike protein on in vitro aggregation of alpha synuclein- probable molecular interactions and clinical implications"

Rita Raisman-Vozari[1]

1 Institut du Cerveau (Paris Brain Institute)

Potential competing interests: No potential competing interests to declare.

The present paper investigated the interactions of Spike (S) protein of SARS-CoV-2 with α-synuclein because of the occurrence of Parkinson's disease following both COVID-19 and the vaccination by different vaccine types. (However, this is not definitely proved). The final aim was to understand the molecular links between COVID-19 and Parkinsonian pathogenesis (the aim was not attended). The subject is very interesting, however, the paper is too simple, it contains only two experiments and they do not analyze if the effect is dependent on the concentrations of S protein or α-synuclein. (They used only one concentration for both). Are fibrils formed in the presence of S protein morphologically different? Are they more or less toxic? The only experiment in vitro presented is extrinsic fluorescence using the ThT assay (only one concentration). It is not sufficient to demonstrate an interaction.

I do not understand why they use the denomination group 1 to 3. It is not clear how many times experiments were done (only one?). Which is the origin and purity of either α-synuclein or S protein (Are there commercial or in-house?). Further biophysical characterization needs to be done.

Authors should put more effort to prepare this work. For instance, sentences were similar in the abstract and the Introduction. The English language need to be revised.