

# Review of: "[Case Report] Profound Symptom Alleviation in Long-Covid Patients After PAMP-Immunotherapy: Three Case Reports"

Lavanya Visvabharathy<sup>1</sup>

<sup>1</sup> Northwestern University

Potential competing interests: No potential competing interests to declare.

This series of case reports by Gaudek et al. describes 3 long COVID patients whose symptoms were partially ameliorated by the administration of PAMP immunotherapy. The authors state that PAMP immunotherapy was originally developed against cancer in Germany in 1895, where doctors used streptococcal extracts to induce fever and ultimately cancer remission in patients. The data is interesting, but there are significant limitations in the level of detail provided about each case, the composition of the PAMP drugs themselves, and speculation about the mechanism without data.

In particular, the authors should have provided far more detail about each case study, especially cases 2 & 3. Each case should have its LC symptoms described in more detail, documentation of the infection date relative to treatment, LC symptom severity, etc. The case study from patient 1 had far more detail, and the paper would benefit from other cases having the same.

Secondly, the authors state that, "...we presume that PAMP substances are contained in the drug," without stating the drug composition or drug name(s). This is problematic because the reader is forced to simply believe the authors when they say that PAMPs are found in this treatment, but without knowing whether the drugs were bacterial extracts, purified bacterial cell wall components, etc., the reader has no way to judge the treatment protocol. The authors should have attempted to identify the components of the drug that could stimulate PAMP pathways, and if that was not possible, they should have explained why. This is a serious limitation of the manuscript.

Overall, the findings are interesting, but the level of detail, the composition of the treatment, and the sample sizes are too low to draw any conclusions from the data. The 3 patients also had a relatively modest symptom improvement, which makes the reviewer question the utility of PAMP-based treatments for long COVID as opposed to other more targeted strategies such as developing novel antivirals to treat persistent SARS-CoV-2 infection.