**Biochem COVID: Research Papers II Activity. Mutational Analysis**

Even though COVID-19 has a proofreading capability, mutations will occur. In addition, mutations were identified in the evolution of SAR2 from SARS. Thus an understanding of the changes in amino acid primary and tertiary structure will inform us of these changes and help point to the functional consequences of the mutations. Students will be placed in groups to work via video conferencing to review the public information and the primary literature for the COVID-19 mutations and 1) evaluate the accuracy of how the science has been communicated, and 2) Prepare key questions to drive a dialogue on a discussion board.

**Assignment 1)** Now that you have each enriched your understanding of COVID, it is time to evaluate how the science has been communicated to the public. Summer 2020, stories of a point mutation in the spike protein sent a series of news articles claiming this is a big deal or this is not something to worry about.

Review the linked media stories, ([Media Story 1](https://www.scripps.edu/news-and-events/press-room/2020/20200612-choe-farzan-coronavirus-spike-mutation.html), [Media Story 2](https://www.sciencenews.org/article/coronavirus-covid19-mutations-strains-variants), [Media Story 3](https://www.news-medical.net/news/20200703/Mutated-European-strain-of-coronavirus-more-contagious-but-less-potent.aspx), [Media Story 4](https://www.news-medical.net/news/20200420/Mutations-in-novel-coronavirus-make-it-more-dangerous.aspx)) and these linked publications/prepubs ([pre-paper1](https://www.medrxiv.org/content/10.1101/2020.04.14.20060160v2), [paper2](https://www.biorxiv.org/content/10.1101/2020.06.20.161323v1), [paper 3](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7247990/), [paper 4](https://www.cell.com/cell/pdf/S0092-8674(20)30820-5.pdf)). As a group discuss and answer the following (10 points):

* What are the key differences between the lay articles about the point mutation?
* Did they accurately describe the evidence in the primary literature?
* What language are they using to induce an emotion or generate attention? Is this warranted by the data?
* Did the authors ignore parts of a scientific publication(s) to bias their article?
* What is the authors of the articles motivation for such things?
* Bonus point – what is a pre-print? Are there different versions of some of these articles? What are the changes and do they impact the media’s interpretation? What kinds of comments are being provided in the preprint service to the authors?

As a group, write what you think is an appropriate article on the point mutation using language appropriate for a lay audience. (10 points)

**Assignment 2)** As you learned about the spike protein of COVID-19, there are a handful of mutations found as the virus evolved from SARS to SARS2 (COVID-19). Review the [Nature](https://www.nature.com/articles/s41591-020-0820-9) paper and your peer’s video presentation on this mutation. Provided are two research publications on the impact of these mutations ([paper 1](https://www.sciencedirect.com/science/article/pii/S1097276520302641)) ([paper 2](https://www.pnas.org/content/106/14/5871))([paper 3](https://www.cell.com/trends/molecular-medicine/pdf/S1471-4914(20)30065-4.pdf)). Using these two peer reviewed publications, investigate other primary literature and engage in the COVID Mutation Discussion Board

* Each group will be assigned one of these papers.
* The group (10 points) will post an assigned discussion topic from their paper that addresses ONE of the following: identifies key-concepts of the paper, highlights one of the important results/conclusions from the paper, discusses the approach, results and conclusions of one of the most important figures, extends or applies issues/conclusions of the paper, were appropriate controls (both positive and negative) used in making the final conclusions, or discusses strength/weaknesses of the clarity of the paper.
* Each person will individually, participate with comments, questions and discuss at least four threads – two from the paper they were assigned, and three from the other paper (10 points). A rubric describing the discussion post will be included on the discussion board.