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Teaching and assessing experimental methods and data analysis in a pandemic

The second year course Analytical Techniques in Biochemistry is a compulsory module for the biochemistry and chemistry students at the University of Exeter. Due to the Covid-19 pandemic, we decided to streamline the course to ensure the students were not overloaded and to embed Covid-19 into the module. One of us (AMS) had developed an antibody test for Covid-19, and ethics approval was granted for the teaching staff to be regularly tested using the Attomarker Covid-19 triple antibody test1 and for the results to be shared with the students. Developments of the test moving from a blood to saliva test were also shared during the module. During the November lockdown we ran a cryo-EM competition where students reimagined ATP-Synthase (from the cryo-EM Data Resource2) as Lego, in food, or as art.
Bespoke laboratory videos were created3, Learning Sciences simulations4 and a Smart Worksheet5 used to replace the laboratory sessions. We reasoned that while students were not able to do the experiments themselves, they could still benefit from processing data and writing a full laboratory report. We had access to many years of historical data and so data sets could be provided but we wanted to ensure the work submitted was the students'own and not the result of collaboration. In addition, the final exam would be on-line and non-invigilated meaning that if we used a single data set in the exam, there was the likelihood that students would 'collaborate'and share their answers. For both the exam and the assessed practical we used R to produce individual data packs for the students (raw data and images) and staff (plotted data and all worked answers). ANOVA (Kruskal-Wallis Test) shows no statistical differences for this year's laboratory report (compared to 2016-2020) or for the exam (compared to 2019, 2020).

1. https://www.attomarker.com/the-triple-test#AboutTheTripleAntibodyTest
2. www.emdataresource.org
3. Bitpod.co.uk
4. https://learningscience.co.uk/labsims
5. https://learningscience.co.uk/smart-worksheets

Key words

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