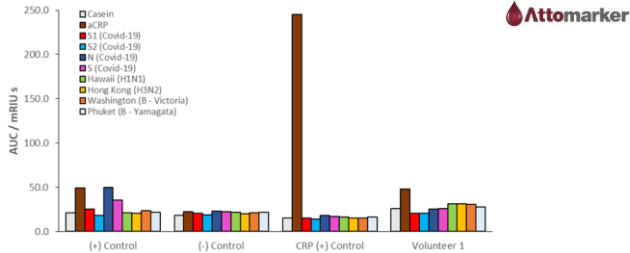


## Integrating Covid-19 into an Analytical Techniques Module



## Having Fun

During lockdown 2 we ran a cryo-EM competition where students reimaged ATP-synthase in food, Lego or art.



Ethics approval was granted for the teaching team to be tested with the Attomarker triple antibody test. The theory and modification from blood to saliva test was discussed in class.

## Student Feedback:

*'I really enjoyed making the ATP synthase. My mum taught me how to crochet in the first lockdown, it's so therapeutic and I've convinced some of my friends to learn :)'*

## Experimental methods teaching:



Bespoke videos were created showing us performing the experiments. Learning Science simulations and a Smart worksheet also used.

## Experimental methods assessment:

```

23 #Actions for each individual dataset
24
25 for (j in 1:61) {
26   #j = 1
27
28   # Generate Bradford data
29   Bradford <- data.frame(Tube = c(1:6),
30     Volume_of_BSA_solution_uL = c(10),
31     Volume_of_water_uL = c(10),
32     Absorbance_595nm = c(0),
33     concentration = c(0),
34     Corrected_Absorbance_595nm = c(0))
35   grad <- 0.0025*(sample(0:100,1)/100000)
36   back <- 0.9*(sample(0:200,1)/1000)
37
38 for (i in 1:6) {
39   Bradford[i,4] <- round(((100-error[2])+((sample(0:100,1)/100000)*grad))*((100-error[2])
40

```

Coursework & Exam

Unique data sets generated from historical data using R (~130 lines)

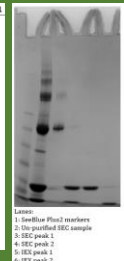
1. BIO2090 Laboratory report assignment 2020/21

Data for student: 68063638

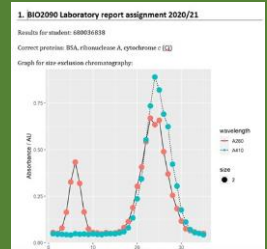
Data for size exclusion chromatography

Column void volume: 13 mL

Fraction	abs	wavelength
1	0.052	A280
2	0.050	A280
3	0.079	A280
4	0.164	A280
5	0.326	A280
6	0.433	A280
7	0.715	A280
8	0.145	A280
9	0.074	A280
10	0.055	A280
11	0.053	A280
12	0.048	A280
13	0.054	A280
14	0.050	A280
15	0.053	A280
16	0.060	A280
17	0.082	A280
18	0.113	A280
19	0.188	A280
20	0.303	A280



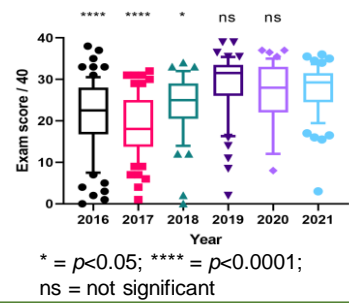
Student pack: raw data (numerical and images)



Staff pack: plotted data and answers

## Open book online exams

- 24-hour exams preferred option by students
- Risk of collusion with unique answers
- Unique data sets used to deter cooperation
- Students all downloaded their own data set



Average on data section of exam consistent with previous two years despite being open-book and online.

Smart Worksheet used from 2019-2021 to support data analysis

## Student Feedback:

- ✓ Liked the Videos and Smart Worksheet
- ✗ Did not like not being able to "check their answers" with a friend

## Staff Feedback:

- ✓ Unique data sets provided an authentic assessment for online exam which deterred students from collusion.