***Ex-vivo* Electrochemical pH Mapping of the Gastrointestinal Tract in the Absence and Presence of Pharmacological Agents**

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This dataset includes data from electrochemical measurements.

**1. Figure 1**: Open circuit potential measurements of pH for glass and iridium oxide pH electrodes.

**Analysis** includes the Origin files used to process the raw data. **Data** includes the raw text files and program files (CHI and Autolab .nox) for the pH measurement using iridium oxide and glass pH electrodes. **Figures** include the pdf version of figure 1 used in the final version of the publication.

**2. Figure 2:** Square wave voltammetry measurements for boron doped diamond – quinone pH electrodes.

**Analysis** includes the Origin files and Excel files used to process the raw data. **Data** includes the raw text files and CHI program files for the pH measurement in mucin using three electrodes, repeated four times. **Figures** include the .png version of figure 2 used in the final version of the publication.

**3. Figure 3:** FE-SEM images of BDD-Q pH electrodes, before and after mucin pH measurement.

**Data** includes the raw SEM images collected. **Figures** include the pdf version of figure 3 used in the final version of the publication.

**4.** **Figure 4:** Photograph of the mouse tissue

**Figures** include the pdf of the figure 4.

**5. Figure 5:** pH measurements made across the gastrointestinal tract from the oesophagus to the duodenum, using BDD-Q pH electrode, in the absence and presence of pharmacological treatments.

**Analysis** includes the Prism file used to process data. **Data** includes the raw text and CHI program files for six repeats of the pH measurement taken across the gastrointestinal tract. **Figures** include the pdf version of figure 5 used in the final version of the publication.

**6. Analysis** contains the Origin file used to process data for **ESI 6**, and the python scripts that have been used to process BDD-Q pH data.

**7. Data** contains the raw text and program files for **ESI 6**. The raw data files for ESI 3 and 4 are the same as Figure 1, represented differently. The raw data files for ESI 5 is the same as Figure 2 – represented differently.

**8. Figures** contain the .png version all the ESI images used in the final version of the publication, and the table of contents image.