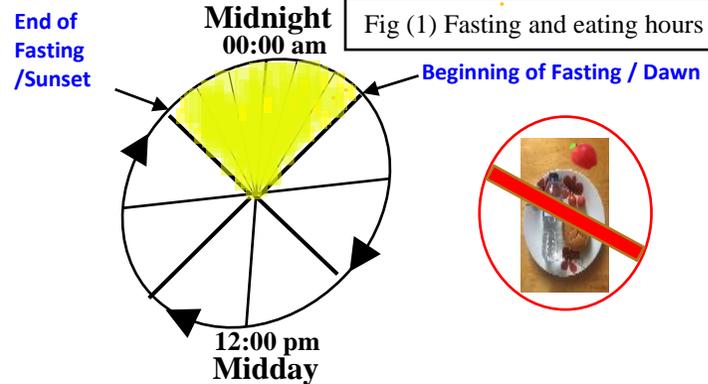


## Background & Objective

- Intermittent fasting (IF) has been reported to have many health benefits including prevention of cancer, diabetes and neurodegenerative diseases<sup>1</sup>.
- Ramadan Fasting (RF) is a type IF.



- In RF people refrain from eating and drinking from Dawn to Sunset for 29-30 days annually.
- The objective of this study is to monitor the impact of RF on biochemical pathways.

## Materials & Methods

A cohort of 24 healthy adults' (20 -60 years) on daily fasting pattern of ~17h for consecutive 30 days who live in Leicester, UK were recruited in May 2019.

- Urine samples were collected twice:
  - Baseline (Last 2 days in the fasting month)
  - End-line (40 days post-fasting month)
- Samples were subject to LC-MS/MS proteomic analysis.

Fig 2. A schematic diagram describing the steps of proteomic analysis

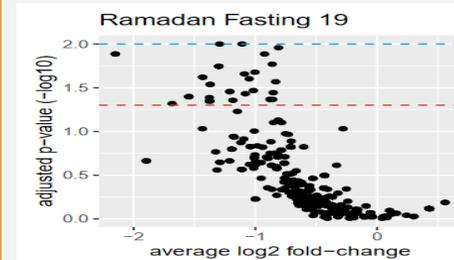
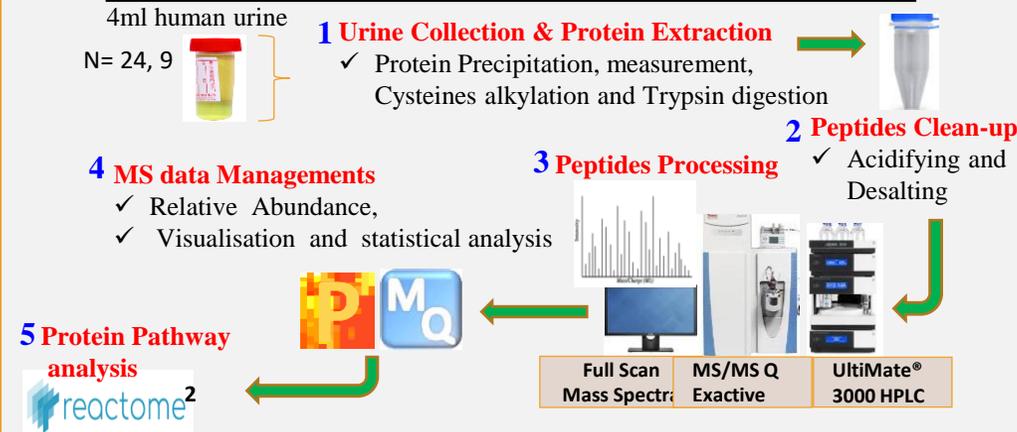


Fig (3) Volcano plots summarizes pathway results, Every point is one pathway. The x-axis represents the average fold-change of all proteins within that pathway. The y-axis represents the p-value where "higher" values are more significant (-log10 transformation). The red line represents  $p = 0.05$ , and the blue line  $p = 0.01$ .

Fig (4a) *O*-Linked Glycosylation Pathway

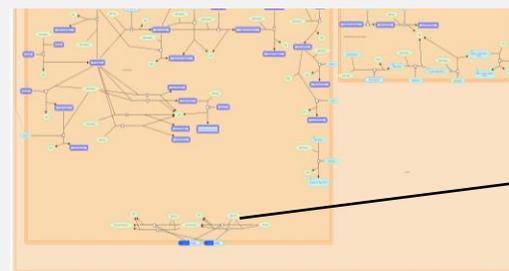


Fig (4b) LARGE and LARGE2 in non-fasting compared to fasting

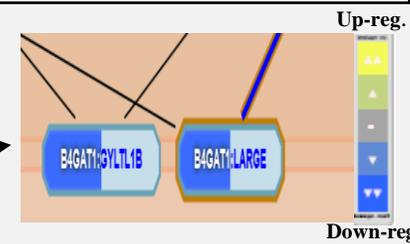
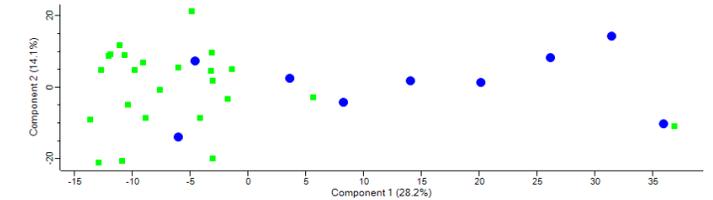


Fig (5) Individual proteome comparison. Similar patterns with minor overlap were seen by multivariate analysis using Principal Component Analysis of fasting (.) and non-fasting (.) samples.



## Results

- 25 biochemical pathways including *O*-linked glycosylation pathway were found differentially expressed fig (3).
- Up-regulation of Glycosyltransferase-like protein LARGE2 and Glycosyltransferase-like protein LARGE in fasting fig (4a) and (4b).
- Beta-1,4-glucuronyltransferase was observed mainly in fasting samples

## Conclusions

- One of the most important post-translational modification (Glycosylation) was affected by RF.
- IF can be inexpensive approach for improving global public health
- Further targeted models to investigate into the link between identified pathways and IF is recommended.

## References

- Mindikoglua, A. et al (2020) *Journal of Proteomics*. <https://doi.org/10.1016/j.jpropt.2020.103645>.
- Jassal B, et al. (2020). *Nucleic Acids Res.* PubMed PMID: 31691815.