

# PhD placement/PIPS: Coding and communicating for the next generation of Network Analysis

## Placement supervisors:

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## Placement department:

Trait Diversity and Function

## Placement overview and objectives:

Analysis of metabolism, in either an individual, a colony or even a whole ecosystem, is increasingly being recognised as a network question. Understanding the mechanisms that drive the dysregulation of metabolic systems requires analysis of several, interconnecting parts of the system. This requires big metabolomics data, however, data of such size and complexity requires careful sifting to test hypotheses precisely and to identify the meaningful parts. We have developed a computational tool for this type of analysis and used it for a few different questions in metabolism, some example papers are linked below. It is called [Lipid Traffic Analysis](#).

## Example papers:

[Lipid Traffic Analysis reveals the impact of high paternal carbohydrate intake on offsprings' lipid metabolism](#)

[Lipid Metabolism is dysregulated before, during and after pregnancy in a mouse model of gestational diabetes](#)

[Dietary PUFAs drive diverse system-level changes in lipid metabolism](#)

There are 3 larger questions aimed at developing this tool in which the placement could take place. These projects are aimed at improving accessibility of the software, the features it has and the communicability of the results. The sub-projects therefore include (i) generating a UI, (ii) generating a module for another analysis feature and (iii) designing figures to represent the analyses graphically to specialist and non-specialist audiences.

## Tasks to be undertaken/possible projects:

1. Preparation of a User Interface for LTA v4.0. Coding in Python
2. Preparation of a module for Cluster Pattern Analysis. Coding in Python
3. Design of Network diagrams for Switch, Abundance and Cluster Analyses. (illustration, e.g. Inkscape)

#### Required skills and experience:

- Proficient in Python (Sub-projects 1 and 2 above only)
- Proficient in *e.g.* Inkscape (Sub-project 3 only).
- Knowledge of metabolism/metabolic systems an advantage but by no means compulsory
- Interested in coding, science communication and network analysis

#### Skills and areas of knowledge that can be developed:

- Knowledge of coding and software development in Python
- Network analysis
- Working in a team
- Presenting to a variety of audiences
- Develop knowledge of metabolism and network analyses.

#### Location of work:

Kew, Richmond. Hybrid work is possible.

#### Length of placement:

3 months but open to longer.