# Job Description – EPSRC DTP Internship: Single cell network analysis using the Galaxy interface

*“EPSRC’s Vacation Internships scheme gives undergraduate students a taster of what it is like to do research. The students are given practical, first-hand experience of working on and carrying out research in a UK university.”*

Source: [Internships and placements – UKRI](https://www.ukri.org/councils/epsrc/career-and-skills-development/studentships/flexibility-for-funders/internships-and-placements/)

To be eligible for an EPSRC Vacation Internship you **must**:

* be an undergraduate or Masters student in a STEM subject area.
* not have completed your degree studies before the planned end of the internship. An internship should generally take place in the summer vacation **before** your final year of study.
* have a right to work in the UK and carry out the placement whilst resident in the UK. We are **not** able to sponsor visas for the internship.

**About the Role**

Biologists use bioinformatics tools to analyse big data, but often without informed understanding of data management techniques or statistical interpretation. Such perspective is particularly critical in single-cell RNA sequencing analysis, where background debris is high, artefacts are common, and analysis is not standardized. In this project, the intern will build on an initiative to develop informative single cell RNA-seq resources. First, they will perform a literature review on gene network analyses from single cell data outputs, comparing and contrasting current methods. They will then create workflows for performing such analyses using available tools within the Galaxy user interface. They will then evaluate these workflows through user testing by members in Dr Bacon’s group, applied to research data of interest. To ensure reproducibility of these workflows, they will work with the [Galaxy Training Network](https://training.galaxyproject.org/) to create a sustainable tutorial, written in Markdown, that will link with current offerings.

The role will develop skills and experience in:

* Literature review
* Computer programming languages R, Python, Markdown
* Data analysis
* Scientific writing
* Writing for a public audience
* Presenting to a scientific audience
* Collaboration – by partnering with the Galaxy Project, we engage with a strong research community that is highly supportive of new members

**About the Unit**

We are a group of Open University staff and students who carry out world-leading research and teaching across a range of disciplines from human biology, neurosciences and biomedicine, to chemistry, analytical sciences, bioinformatics and the molecular basis of life. We are also members of five research clusters spanning the university: cancer, neuroscience, cardiovascular, chemistry and materials cluster, and the scholarship cluster.

<https://www.open.ac.uk/stem/life-health-chemical-sciences/>   | [https://stem.open.ac.uk](https://stem.open.ac.uk/)

**Key Responsibilities**

* Perform a literature review of gene network analyses
* Develop programming skills in R, Python, Markdown
* Perform tutorials on: using the Galaxy interface; single-cell RNA-seq analysis; network analyses; and building tutorials within Galaxy
* Build, test and compare workflows for network analyses given disease datasets
* Build a tutorial to accompany the best workflow within Galaxy
* Liaise with developers & Galaxy community to troubleshoot any tool issues or Galaxy questions
* Communicate with the lab group and wider Galaxy community using Slack & Gitter chat forums

**Skills and experience**

Essential:

* Mathematics, statistics, computer science, data science, or related degree path
* Basic programming skills

Desirable:

* Experience with collaborative working applications (GoogleDrive, Slack)
* Programming skills (beyond the introductory tutorial)
* Introductory biology (GCSE, A-levels, or equivalent could be sufficient here)
* Initiative
* Time management

If you would like further details about the role before making an application, then please email [stem-research-student-support@open.ac.uk](mailto:stem-research-student-support@open.ac.uk) quoting the reference number and job title.