

Research Role Profile

<b>Job Title:</b>	Research Fellow A
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<b>Responsible to:</b>	Head of research group, or principal investigator
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<b>Responsible for:</b>	Not applicable
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<b>Job Summary and Purpose:</b>
To undertake research in accordance with the specified research project(s) under the supervision of the principal investigator.

<b>Main Responsibilities/Activities</b>
<p>To undertake a range of research activities within a specified research area, assuming responsibility for specific areas of projects and making use of new research techniques and methods, in consultation with the research award holder or supervisor. This may include fieldwork, interviews, laboratory experimentation, critical evaluation and interpretation, computer-based data analysis and evaluation or library research.</p> <p>Using initiative and creativity to identify areas for research develop new research methods and extend the research portfolio. Analysing and interpreting results of own research. Write up results and prepare papers for submission to appropriate journals and conferences, and other outputs as required and/or appropriate. Attend appropriate conferences for the purpose of disseminating research results of personal development. The post holder may also contribute to writing bids for research grants and will contribute to collaborative decision making with colleagues in areas of research.</p> <p>Continually to update knowledge and develop skills, and translate knowledge of advances in the area into research activity.</p> <p>To plan and manage own research activity in collaboration with others. To carry out administrative tasks associated with specified research funding, for example risk assessment of research activities, organisation of project meetings and documentation. Implementation of procedures required to ensure accurate and timely formal reporting and financial control.</p> <p>To contribute to teaching in the Faculty by carrying out student supervision and/or demonstrating within the post holder's area of expertise and under the direct guidance of a member of departmental academic staff, as appropriate.</p> <p>The post holder may occasionally be required to supervise more junior research staff.</p>

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### Person Specification

#### The post holder must have:

A doctoral degree in a relevant discipline (although individuals who have almost completed a doctoral degree may be appointed). Consideration may also be given to individuals who do not hold a doctoral degree but have required skills based on a number of years experience in specified / relevant fields

The post holder will have authority over some aspects of project work and must be capable of providing academic judgement, offering original and creative thoughts and be able to interpret and analyse results.

### Relationships and Contacts

Direct responsibility to the principal investigator or academic supervisor. The post holder may be asked to serve on a relevant Faculty committee. There may be additional reporting and liaison responsibilities to external funding bodies or sponsors. The post holder may work on original research tasks with colleagues in other institutions.

### Special Requirements

To be available to participate in fieldwork as required by the specified research project

#### All staff are expected to:

- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
- Help maintain a safe working environment by:
  - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand
  - Following local codes of safe working practices and the University of Surrey Health and Safety Policy
- Undertake such other duties within the scope of the post as may be requested by your Manager.

### Addendum

This document provides additional information relating to both specific aspects of the post/faculty and any post specific person specification criteria. The information contained within this document should always be read in conjunction with the accompanying generic Role Profile.

#### Job Title:

Research Fellow A in Food Proteomics

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### **Background Information/Relationships**

The post is based in the Food and Molecular Immunology research group led by Professor Clare Mills and forms part of her ongoing collaboration with Waters Corporation and Nestlé.

The overall focus of the post is to apply state-of-the-art proteomics methods to define the molecular characteristics of extensively hydrolysed infant formula (EHF) as determinants of their immunological activity. A crucial aspect of manufacturing EHF is to ensure that the hydrolysis removes both intact cow's milk protein (in particular the allergens) and resulting peptide fragments which have the capacity to trigger an allergic reaction. Current physicochemical methods used to monitor the effectiveness of protein hydrolysis and assuring final product quality have limitations as they are unable to provide sequence-level information and consequently cannot indicate whether IgE epitopes have been effectively removed and tolerogenic T-cell epitopes retained. Current methods are also unable to determine the extent of processing-induced modifications, such as lactosylation and modified amino acids. An alternative methodology able to provide such sequence-level information, is mass spectrometry (MS). Ion mobility (IM) MS provides additional power to analysing complex mixtures and is being used to particular effect in analysing the conformation and posttranslational modification of proteins and biological drugs. IM separates molecules via collisions with a gas in a weak electric field. This provides complementary separation to mass spectrometry and allows derivation of "collision cross-section (CCS)", which can be used for 3D structural characterisation of molecules and as a robust molecular identifier along with mass.

Working with Waters Corporation and the Nestlé team, the project will explore the use of IM-MS methodology to monitor both residual intact protein and peptide profiling in EHF and identify and semi-quantify processing induced modifications which may affect the safety of EHF for allergic infants. As part of the project the postholder will have training visits to the Nestlé research centre in Lausanne, Switzerland and the Waters Corporation MS centre at Wilmslow, UK.

### **Person Specification**

This section describes the sum total of knowledge, experience & competence required by the post holder that is necessary for standard acceptable performance in carrying out this role. This is in addition to the criteria contained within the accompanying generic Role Profile.

	<b>Essential/ Desirable</b>
1. A PhD in biochemistry, biological chemistry or a related discipline, or equivalent professional experience.	Essential
2. Experience of using mass spectrometry for 'omics analysis (covering proteins, or lipids or metabolites) characterisation and associated informatics analysis.	Essential
3. Experience of other molecular analysis (e.g chromatography, gel electrophoresis) and characterisation (e.g. using immunochemical methods such as immunoassay, immunoblotting).	Essential

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4. The ability to work flexibly and co-operatively within a team of experimental scientists.	Essential
5. A high level of numeracy and computer literacy; excellent verbal, written communication and presentation skills.	Essential
6. Experience of routine management of laboratory work and staff/student supervision and training.	Essential
7. Excellent organisation skills including record keeping and time management and the ability to manage competing priorities. A high standard of attention to detail.	Essential
8. The ability to contribute to the development of new proposal ideas by undertaking background research and producing of preliminary/feasibility data.	Essential
9. Able to produce high quality written material for reports, scientific papers and grant proposals.	Essential
10. Proficient in core software for general data analysis, report writing and preparation of data in figures and posters, and presentations.	Essential
11. Knowledge of and evidence of compliance with relevant Health and Safety regulations and the Data Protection Act.	Essential
12. Evidence of the ability to undertake complex problem solving and interpretation of experimental results.	Essential
13. Experience of drafting and working to Standard Operating Procedures and risk assessments including COSHH risk assessments and a good understanding of GDPR in relation to working with patient data.	Essential
14. The willingness to undertake any necessary training and to undertake visits of up to a week in duration in Lausanne (Switzerland) or Wilmslow (UK)	Essential
<b>Special Requirements</b>	<b>Essential/ Desirable</b>
1. Experience of working on proteomics, including food.	Desirable
2. Experience of handling complex mixtures of proteins/peptides.	Desirable

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3. Experience of protein bioinformatics

Desirable

**Key Responsibilities**

This document is not designed to be a list of all tasks undertaken but an outline record of any faculty/post specific responsibilities (5 to 8 maximum). This should be read in conjunction with those contained within the accompanying generic Role Profile.

- (1) Develop an analytical pipeline to define the composition of commercially manufactured EHF, or of samples from specific production process steps, at a molecular level with regards:
  - a. Residual intact cows' milk protein focusing on BLG, an acknowledged problem in EHF;
  - b. Large polypeptide fragments which are resistant to hydrolysis;
  - c. Lower molecular weight polypeptides (especially those originating from caseins) which may aggregate especially following reconstitution of EHF;
  - d. Processing-induced modifications including Maillard reaction products.
- (2) Interpret MS profiling data within the context of the biological activity of the EHF in terms of potential to either cause an allergic reaction and potentially support development of tolerance.
- (3) Drafting of reports for Nestlé and Waters Corporation and drafting of research results for publication and presentations at scientific meetings.
- (4) Participate in and support the project management including communication and coordination of activities between project partners.