Post Specification **Post Title:**	Research Fellow in biobased and biodegrdable polymer composites – Only approved titles may be used – for further information please see the academic titles document. https://www.tcd.ie/hr/assets/pdf/Academic_title.pdf
Post Status:	1 year Fixed-term Contract or Specific Purpose Contract – Full-time – With possible 2 years extension
Research Group / Department / School:	Polymeric Materials & NanoComposites (PMNC) Group, AMBER/School of Chemistry, Trinity College Dublin, the University of Dublin
Location:	School of Chemistry and AMBER, Trinity College Dublin, the University of Dublin College Green, Dublin 2, Ireland
Reports to:	Prof. Ramesh Babu
Salary:	Appointment will be made on the point 3 of the IUA post-doctorate researcher Level 2 salary scale per annum at a point in line with Government Pay Policy, appointment will be made no higher than point based on experience
Hours of Work:	40
Closing Date:	12 Noon (Irish standard time) 27th Jan 2020 (or until filled).

The successful candidate will be required to take up post as soon as possible

Post Summary

Background

Polymeric Materials and Nanocomposite (PMNC) group (http://physics.tcd.ie/pmnc/) at TCD, is seeking to appoint a Postdoctoral research fellow to develop biodegradable polymer composites suitable for packaging applications, which are completely recyclable, compostable and biodegradable. This is an exciting opportunity to work on real world problem of plastic waste and designing of circular plastics. The s project **BioPost** funded by Environmental Protection Agency (EPA) Ireland and the project aim is to develop sustainable environmentally friendly plastics using commercially available and indigenous novel biodegradable polymers that are suitable for packaging applications and evaluate their end-of-life options; separation from mixed plastic waste, recyclability, compostability and biodegradability under standard industrial conditions.

Overview of the Role:

An experienced researcher is required to drive a project on biodegradable and compostable polymer composites for packaging applications. The Project will require working with various biobased and biodegradable polymers, blends, nanoadditives, exfoliated two-dimensional materials and the subsequent production of polymer composites. The first stage will be proof of concept work to characterise the degradability properties of such composites and subsequently scaling them up on pilot scale and evaluate their end-of-life options.

Standard Duties and Responsibilities of the Post

The post holder will be responsible for making the biodegradable polymer composites by melt extrusion process using lab scale Brabender and 20/40D pilot scale twin-screw extruder to characterise and assess the biodegradability of various polymer composites. The Project will require working knowledge with twin-screw extruder and processing of commercial biodegradable polymers/blends using various nanoadditives to assess the biodegradability of various films produced. As a part of the project, it is essential to engage with multiple stakeholders on regular basis to coordinate various activities of the project including timely reporting to EPA.

The core tasks are as follows:

1. Use of Brabender melt mixer and 20/40 D twin screw extruder for making the composites (must)
2. Formulating and improving the properties of biodegradable polymer composites and their blends with various additives (nano) using melt extrusion process.
3. Scaling up the composites for pilot scale production to produce films for packaging.
4. Characterisation of composites for barrier, mechanical, thermal and distribution of nanoadditives by SEM, TEM, and Raman spectroscopies.

5. Analysing the thermal (TGA, DSC, DMA) and mechanical properties of the composites using various analytical techniques.
6. Knowledge of life cycle analysis (LCA)
7. Developing the protocols to assess the recycling and biodegradation of polymer composites.
8. Co-ordinating with various stake holders of the project
9. Writing scientific papers, reports and giving presentations on the research conducted.
10. Working with EPE managers for communication ad dissemination of project results

Funding Information

This position is funded through an EPA Ireland research programme under sustainability pillar

Person Specification

Qualifications

The experience candidate must have a PhD in a relevant field such as chemistry, polymer science and Engineering/materials science, chemical Engineering or physics and/or equivalent industrial experience.

Knowledge & Experience (Essential & Desirable)

Essential

1. The candidate must have a primary degree in an appropriate field such as chemistry or physics with a relevant postgraduate qualification or equivalent industrial experience.
2. The candidate must have strong background and experience with melt processing of polymers using lab scale extruders.
3. Candidates must have demonstrated a proven knowledge of Materials Science (including thermo-polymers, elastomers and fillers) with the ability to solve challenging problems related to the development of biodegradable and home compostable polymer composites
4. Must have working experience with Thermal Analysis (TGA, DSC, DMA), FT-IR, GPC, Melt Flow Index, optical and electron microscopy of polymeric materials to generate data to provide insight into the composition and performance of polymeric materials.
5. Must be a self-determined individual with a capacity to apply new, pre-existing or adjacent technologies to problem solving with minimal supervision.
6. Good leadership skills with the ability to maintain excellent working relationships with both internal and external partners is also required.
7. Strong communication and interpersonal skills, both written and verbal.
8. Excellent written and oral proficiency in English (essential)

Desirable

1. Experience in polymer Rheology and melt mixing of niche additives would be an advantage.
2. Experience of working with industrial collaborators
3. Experience in the training and supervision of junior researchers is desirable.
4. Life cycle analysis (LCA) of Materials and processes

Skills & Competencies

1. Polymer Processing, characterisation and Life Cycle Analysis (LCA)
2. Proven ability to prioritise workload and work to exacting deadlines
3. Excellent communication and written Skills.

Further Information for Applicants

In order to assist the selection process, applicant should submit a Curriculum Vitae and a cover letter that specially address how the candidate skills and experience align with the criteria set out above. **Applicants should reference RF-BioPost in their application.**

URL Link to Area	www.tcd.ie
URL Link to Research Group	https://www.tcd.ie/Physics/research/groups/pmnc/
URL Link to Human Resources	https://www.tcd.ie/hr/

Send CV to babup@tcd.ie