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## Press Release

### **‘Green’ and edible cling film and food packaging made from plants**

University of Nottingham researchers have developed 100 percent biodegradable and edible food packaging made from plant carbohydrates and proteins to replace polluting plastic materials and improve storage, safety and shelf life.

The Sino-UK project is led by [Professor Saffa Riffat](#), from the Faculty of Engineering, whose research group is world-renown for innovations in sustainable materials, energy and building technologies.

This includes their investigations into the structure and functionality of sustainable natural materials such as plant polysaccharides (carbohydrates) and proteins to develop advanced materials for applications in buildings, energy technologies, packaging and beyond.

Using a special technical approach, the team is working on plastic films derived from konjac flour and starch, cellulose or proteins that are fully edible and harmless if accidentally eaten by people or animals - unlike health issues associated with microplastics and other plastic waste that make their way into the food chain.

The researchers have found that plant carbohydrate and protein macromolecules bond together into a special network structure during the film-forming process. The network structure provides the film with a required mechanical strength and transparent appearance for the film to be used as packaging materials.

The project is jointly investigated by Marie Curie Research Fellow, [Professor Fatang Jiang](#), an expert in biodegradable polysaccharide materials for moisture control, thermal insulation and infiltration. He recently joined the University of Nottingham from Hubei University of Technology in China, where part of the study is being worked on.



**Professor Saffa Riffat and Professor Fatang Jiang with innovative bio cling films and food packaging bags**

Prof Riffat, also a Fellow of the European Academy of Sciences and President of World Society of Sustainable Energy Technologies, said: “While plastic materials have been in use for around a century, their poor degradability is now known to cause serious environmental harm. This has led to more stringent recycling targets and even bans coming into force.

“Queen Elizabeth, for example, banned plastic straws and bottles from the royal estates in February 2018, and the EU plans to make all plastic packaging recyclable or reusable by 2030. We need to find degradable solutions to tackle plastic pollution, and this is what we are working on now.”

Fully-biodegradable bags could not only solve the safety and pollution issues of food packaging materials, but also efficiently lengthen the shelf life of fruit and vegetables and other fresh produce.



**Professor Saffa Riffat, Dr Yuehong Su and Professor Fatang Jiang  
with the fully bio-degradable food packaging bags**

“In addition to being edible, degradable, strong and transparent, the packaging materials we are working on have low gas permeability, making them more air tight. This feature cuts moisture loss, which slows down spoilage, and seals in the flavour. This is of great importance for the quality, preservation, storage and safety of foods,” Professor Riffat adds.

The primary market for these plant-based packaging materials will be superstores and food supply chains. The research team is also aiming to advance the technology for general packaging in construction, express delivery and magazines, etc.

The project, currently supported by the £220K Horizon 2020 Marie Curie fellowship, will last two years with the potential to extend for another three to five years if further funding is secured.

—ENDS—

**More information** is available from **Professor Saffa Riffat**, Department of Architecture and Built Environment, on **+44 (0)115 95 13158** or [saffa.riffat@nottingham.ac.uk](mailto:saffa.riffat@nottingham.ac.uk) or **Emma Lowry**, Media Relations Manager, Faculty of Engineering on [emma.lowry@nottingham.ac.uk](mailto:emma.lowry@nottingham.ac.uk) or **+44 (0)115 8467156**.

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## **Notes to editors**

### **The University of Nottingham**

The University of Nottingham is a research-intensive university with a proud heritage, consistently ranked among the world's top 100. Studying at the University of Nottingham is a life-changing experience and we pride ourselves on unlocking the potential of our 44,000 students — Nottingham was named University of the Year for Graduate Employment in the 2017 Times and Sunday Times Good University Guide, was awarded gold in the TEF 2017 and features in the top 20 of all three major UK rankings. We have a pioneering spirit, expressed in the vision of our founder Sir Jesse Boot, which has seen us lead the way in establishing campuses in China and Malaysia — part of a globally connected network of education, research and industrial engagement. We are ranked eighth for research power in the UK according to REF 2014. We have six beacons of research excellence helping to transform lives and change the world; we are also a major employer and industry partner — locally and globally.

### **World Society of Sustainable Technologies (WSSET)**

WSSET - World Society of Sustainable Energy Technologies, is a non-profit organisation led by Saffa Riffat, Professor in Sustainable Energy and Head of the Institute of Sustainable Energy Technology at the University of Nottingham.

WSSET has played an important role in consolidating practical partnerships between academic and industrial organisations, as well as promoting sustainable development/technologies worldwide.

The role of WSSET is becoming increasingly important as the world seeks new solutions to problems arising from climate change, energy shortages and economic crisis.

WSSET promotes sustainable development to minimise the impact of climate change and has a mandate from the world community to set the proper direction for development of a sustainable urban environment as our legacy to future generations.