



# INDRANI BERA

**Technology Centre:** FHI (Food for Health Ireland)  
**Academic Mentor:** Professor Denis Shields  
**Company Partner:** The Happy Pear  
**Company Mentor:** Darragh Flynn

Indrani has received her PhD from Department of Life Sciences and Biotechnology, Jadavpur University, India. During her PhD, she has studied protein-ligand interactions of GPCRs using structural bioinformatics and computer-aided drug design. After completing her PhD, she has done postdoctoral research at University of Maryland, College Park, USA. During her postdoc she has worked extensively on molecular simulations of lipid bilayer membranes and membrane-associated proteins to understand their structure and function. Her research interests are analysis of proteomics data for understanding how various protein/protein motifs are expressed in different cellular conditions using computational biology techniques and studying how biological macromolecules interact and function using structural bioinformatics. Her published research work includes 16 publications in peer-reviewed international journals.

## Professor Denis Shields

Prof. Denis Shields is head of the UCD Bioinformatics and Systems Biology. His team works on various areas of research, spanning clinical, basic, and food related. He has a particular interest in the proteolysis (digestion) of food proteins into peptides and amino acids in the broader contexts of evolutionary, biochemical, disease, health and food science constraints. In the past five years he had 11 invention disclosures, two softwares licensed, and one patent issued, whose invention was licensed to industry. He has advanced computational methodologies that are freely shared with the scientific community via the web server [bioware.ucd.ie](http://bioware.ucd.ie). This is one of the leading sources of computational analysis of peptides and protein motifs, employing state-of-the-art analytical methods.

## Darragh Flynn

Darragh is director of The Happy Pear which represents a healthy food brand. Darragh has very extensive training and mentoring experience, through the EU Erasmus entrepreneur program, where he has seen many visiting MSc students gain an experience at the Happy Pear. He has previous experience in collaborating with universities through work placements. He, as part of the Happy Pear, work directly with Enterprise Ireland already on several initiatives such as R&D. He has done work with other food research centers such as Teagasc in Ireland.

## Food for Health Ireland (FHI)

Food for Health Ireland plays a key role in bringing together academics and food industry partners. It is keen to expand the range of companies served by its extensive skills in food product R&D, covering basic science; eligibility of food claims; protection and development of intellectual property including patents and trade secrets; and EFSA registration. Flynn and Flynn Global Trade Ltd, trading as The Happy Pear, represent a strong health brand, and bringing this company in widens the benefits of FHI's basic research imprint across the Irish food industry.

## Happy Pear Ltd

The Happy Pear represents a strong health brand. It is a plant-based food company producing and distributing healthy food products and providing healthy online course education courses. The mission of the company is to create a healthier, happier world and build community. It seeks to fulfill this mission through the medium of providing genuinely healthy food through its retail stores and cafes, the distribution of healthy packaged food products through 3rd party stores and by educating its participants on its online health education courses.

## Indrani's project

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### **To understand digestibility patterns of sprouts which can help in developing a mixed sprout product with better digestibility**

Healthy foods command a premium choice in the marketplace, as consumers are looking for foods that complement a healthy lifestyle with likely long-term health benefits. Animal protein production systems increase greenhouse gas production, reduce the planet's ability to feed all humans, and reduce the supply of safe water. For these reasons, a move to plant protein sources could lead to health and climate savings over a trillion dollars. But plant proteins are less digestible than dairy proteins. The reasons why some plant proteins are not fully digestible, can depend on a host of factors. Sprouting of seeds goes a big way to helping to digest the plant proteins, as the seedling mobilizes the storage proteins for its own use. But even so, not all the proteins are easily digested. Here, I will focus on sprouting seed to monitor by peptidomics not simply the amount of digestion, but the pattern of digestion. Certain kinds of peptides remain in one seed, because they lack the proteases to digest it. Then when I blend with the active sprouted seed of another seed, it gives a chance for their proteases to work together on each other's proteins. I will investigate how sprouted chickpea can have certain digestion resisting peptides broken down, by blending with sprouted seeds of other species. I will be able to decipher these peptides using my computer analysis of mass spectrometry results on the different prepared food samples. Thus, I will contribute towards finding a better food product with fewer persistent peptides. This is fascinating work as little is known about all steps of digestion of proteins during sprouting.