

An International Perspective

Yashna Chabria, BSc, MSc

Supervisor: Dr Róisín Dwyer

Co-Supervisor: Professor Garry Duffy



Chennai

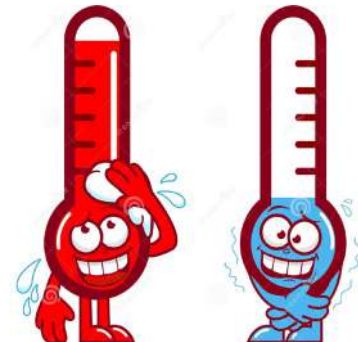


- MSc in Tissue Engineering and Regenerative Medicine at Chettinad University- Project “Impact of Quercetin on Colon Cancer cell proliferation when co-cultured with Mesenchymal Stem Cells”.
- LifETIME CDT Application
- Skype Interview
- Challenging UK Visa Application



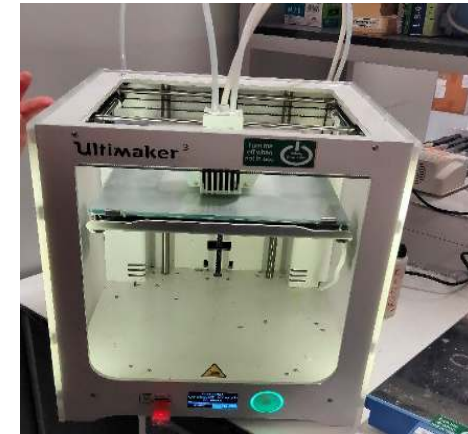


- Exciting Experience to come to Ireland from India
- Temperature Switch from Chennai to Galway!
- Great infrastructure and multiple opportunities at NUIG and the Lambe Institute



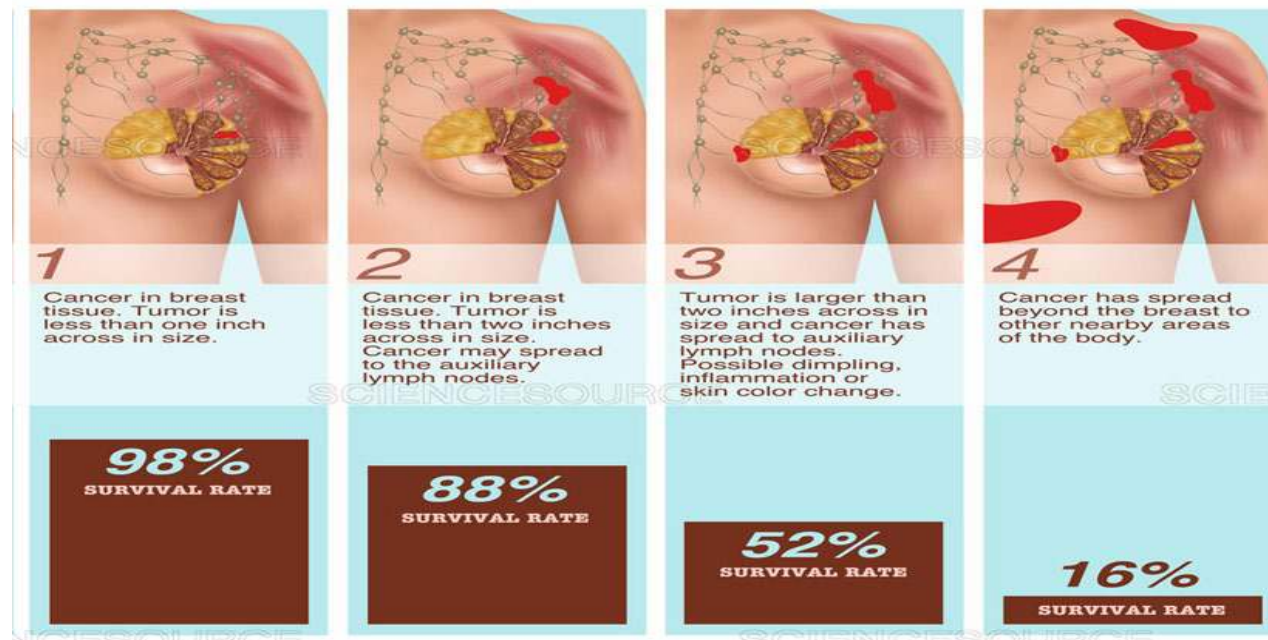
LifETIME CDT Program

- A great opportunity to be a part of this cohort as it has enabled me to interact with individuals from different backgrounds from all over the world
- Introduced to interesting techniques such as Bio Printing, Substrate Fabrication, and Image Analysis at NUIG and the University of Glasgow
- Organised Social Events as well to interact with the other LifETIME CDT students

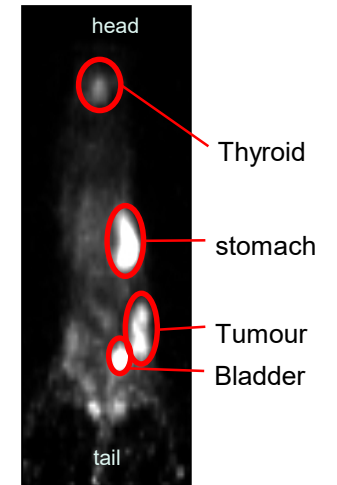
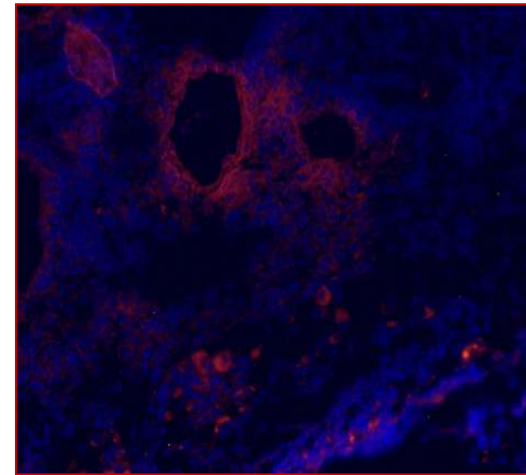


Breast Cancer

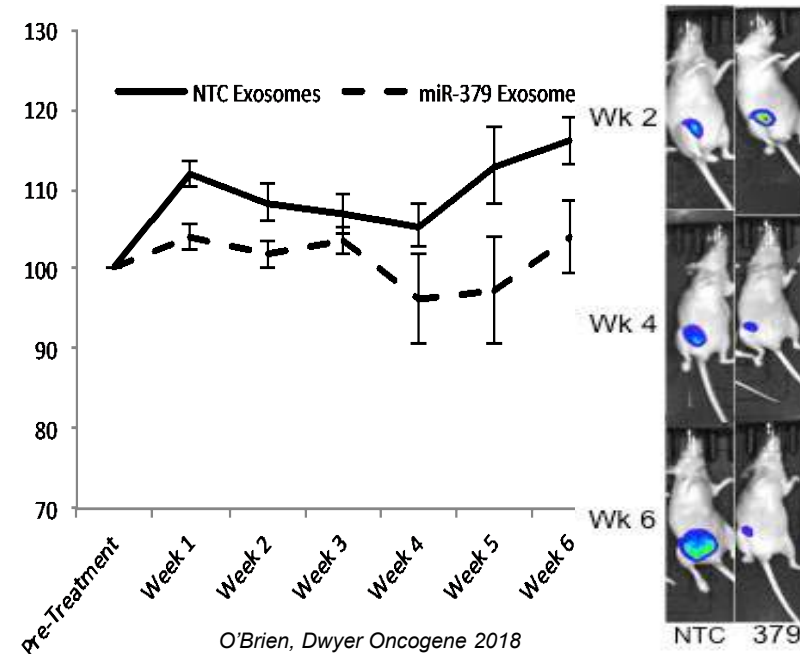
- ❖ Patients in whom the disease has metastasised have poor prognosis. Novel treatments are urgently required.
- ❖ The first stage in the disease spread is critical: the most powerful prognostic indicator in breast cancer is the number of lymph nodes positive for the disease.
- ❖ As \uparrow number of diseased LN \uparrow relapse rates \downarrow patient survival.



- Mesenchymal Stem Cells (MSCs) have unique ability to home to sites of tumors and metastases following systemic administration.
- Combined with apparent immune privilege, immense potential as tumor-targeted delivery vehicles
- Clinical application limited by safety concerns – secretion of protumorigenic factors
- EVs represent fingerprint of parent cell : Engineered MSCs to release EVs loaded with tumor suppressor miRNA



Dwyer et al Clin Ca Res 2007; Dwyer et al Stem Cells 2011.

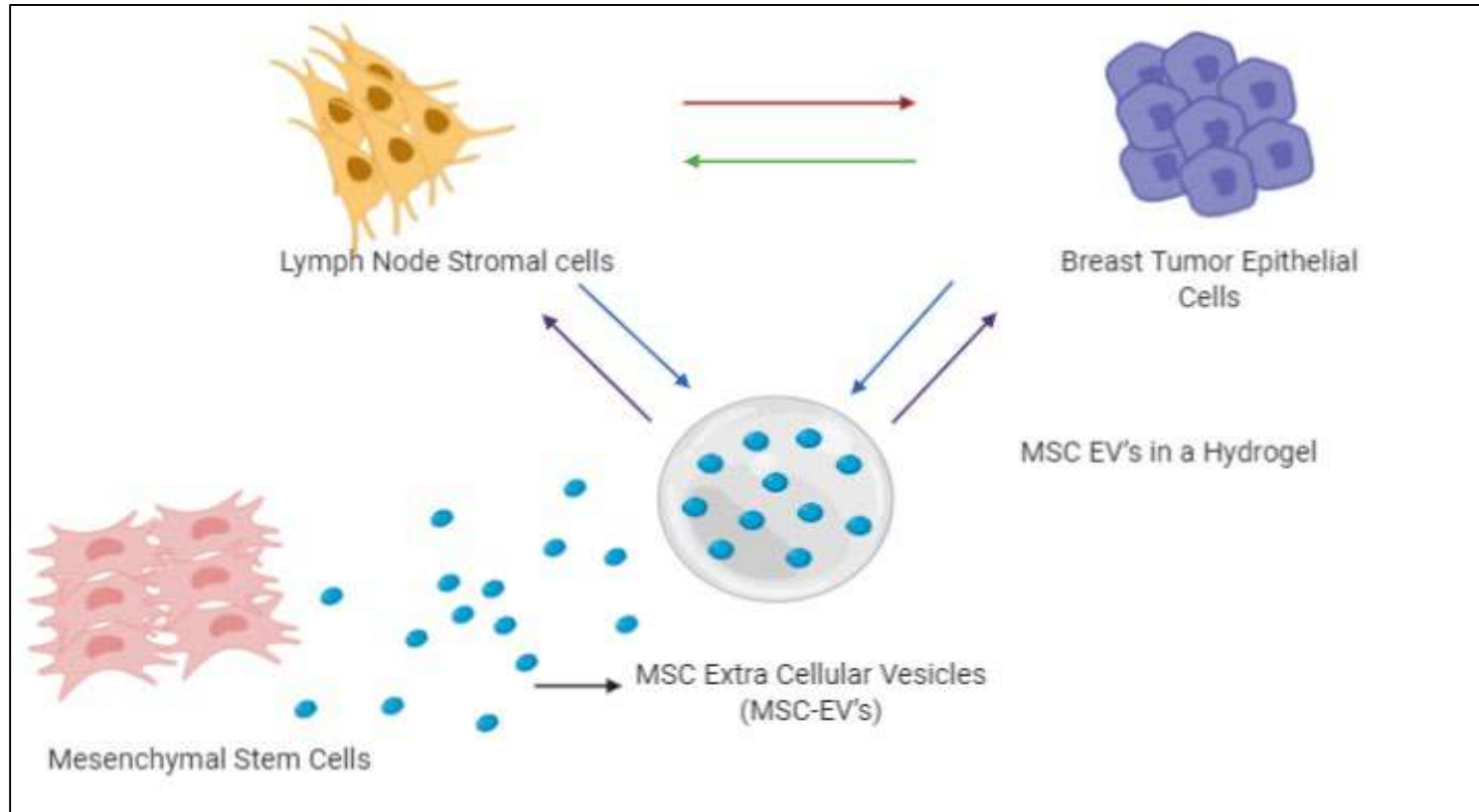


O'Brien, Dwyer Oncogene 2018

Aim: Development of a clinically relevant microfluidic device to study trafficking of therapeutic extracellular vesicles (EVs) encapsulated in a hydrogel to primary breast tumours and lymph node metastases in vitro

Hypothesis: Mesenchymal Stem Cell(MSC)-derived EVs retain the tumour-tropism and immune privilege of MSCs, making them ideal tumour-targeted delivery vehicles for metastatic breast cancer. Controlled systemic release of MSC-EVs offers immense therapeutic promise for treating metastases and reducing breast cancer progression and recurrence.

Microfluidic device of the breast TME



- Analyse the crosstalk between the lymph node stromal and tumor epithelial cells
- Trafficking of the MSC-EVs
- Observe the effects of the other cell types on the hydrogel breakdown

Mentoring Team



Primary Supervisor: Dr Róisín Dwyer, Lecturer in Translational Science
Lambe Institute for Translational Research
Research group focused on development of novel therapeutics for advanced breast cancer, employing Mesenchymal Stem Cells (MSC) and secreted extracellular vesicles (EVs) for tumour-targeted therapy.

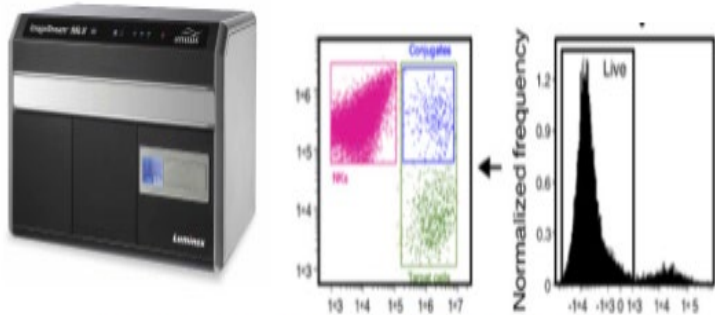
Secondary Supervisor: Professor Garry Duffy, Professor in Anatomy & Regenerative Therapies. Extensive expertise in development of advanced biomaterials and devices to facilitate targeted delivery of therapeutics for future clinical translation



Collaborator: Professor Aoife Lowery, Associate Professor and Consultant Surgeon
Extensive expertise in clinical management of breast cancer. Research interests include innovative methods for post malignancy breast reconstruction using adipose derived stem cells

Workshops and Courses

- Attended the CRDI Course: Techniques and Strategies in Molecular Medicine live streaming at NUIG
- Completed the research Integrity online course
- Attended the Commercialisation and Regulatory workshop organised by Curam with Galway LifETIME CDT students
- Attended the Imaging Flow Cytometry Open Day



Imaging Flow Cytometry Open Day
November 2019, 11:00-16:00





Glasgow



Galway

THANK YOU