

Breast Cancer

Why we focus on Breast Cancer

Breast cancer is one of the most common cancer of females in the western world. Recent molecular analysis has revealed that the traditional, morphological categorisation has underestimated the variety of breast cancer types which exist. Many of these molecular sub-types vary in terms of their clinical behaviour (such as tendency to metastasise) and their responses to therapy. Furthermore, it is clear that pre-invasive breast cancer is similarly heterogeneous, with only ~50% progressing to invasive cancer. Extending these studies offers great hope in terms of being able to predict tumour behaviour and patient outcome with greater accuracy, and also for the development of novel therapies targeted specifically against particular subtypes

What we do

- Engage in a variety of investigations which range in scope from basic molecular biology through to epidemiological studies on incidence and types of cancer in different patient and ethnic groups.
- Maintain a breast cancer tissue bank which is unique in including isolated and characterised cell populations from different tumours.
- Identify genetic variations that predispose to LCIS or DCIS and establish which genetic changes cause these pre-malignant lesions to progress.
- Examine the role of the microenvironment in modifying breast cancer behaviour, focusing specifically on transition of pre-invasive DCIS to invasive disease.
- We are affiliated with the Centre for Cancer Prevention, directed by Professor Jack Cuzick, who lead on several international trials in breast cancer prevention, which have been pivotal in the introduction of new prevention regimes for breast cancer patients.

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Key Publications

- Elosegui-Artola *et al.* Rigidity sensing and adaptation through regulation of integrin types. *Nature Materials* 2014; 10.1038/nmat3960
- Moore *et al.* Therapeutic Targeting of Integrin $\alpha\beta6$ in Breast Cancer. *JCNI* 2014 10.1093/jnici/dju169
- Chioni AM, Grose R. FGFR1 cleavage and nuclear translocation regulates breast cancer cell behaviour. *J Cell Biol* 2012; 197:801-17.
- Ménard *et al.* Receptor tyrosine kinase c-Met controls the cytoskeleton from different endosomes via different pathways. *Nature Communications* 2014; 5, 3907
- Allen *et al.* Altered Microenvironment Promotes Progression of Pre-Invasive Breast Cancer: myoepithelial expression of $\alpha\beta6$ integrin in DCIS identifies high-risk patients and predicts recurrence. *Clin Cancer Res* 2013; 20(2):344-57
- Cuzick *et al.* Tamoxifen-induced reduction in mammographic density and breast cancer risk reduction: a nested case-control study. *J Natl Cancer Inst* 2011; 103: 744-52.

Who does the Research

Prof. Louise Jones	Pathology & Microenvironment
Prof. John Marshall	Tumour Biology
Prof. Kairbaan Hodivala-Dilke	Angiogenesis
Dr. Claude Chelala	Cancer Bioinformatics
Dr. Richard Grose	FGFs and Their Receptors
Dr. Stephanie Kermorgant	Receptor trafficking
Dr. Rebecca Roylance	Molecular Oncology

Wolfson Institute Centre for Cancer Prevention Affiliation:

Prof. Jack Cuzick	Epidemiology & Prevention
Prof. Stephen Duffy	Cancer Screening

Major Funders

- Association for International Cancer Research
- MRC
- Breast Cancer Campaign
- Cancer Research UK