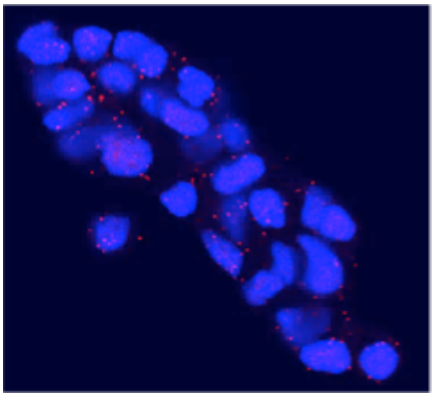
A Technology Opportunity of the University of Liège

New tool to optimize anti-EGFR therapies

The Laboratory of Tumor and Development Biology has established an unexpected functional link between MT4-MMP (MMP-17) and EGFR pathway that allows optimizing treatment and prediction of the responsiveness to anti-EGFR in cancer therapy.

Description

MT4-MMP (MMP-17) is a glycosylphosphatidyl inositol-anchored matrix metalloprotease expressed on the surface of cancer cells. It emerged recently as a key intrinsic feature of breast cancer cells that stimulates tumor growth and metastasis into the lung. Our data reveal direct association of MT4-MMP and the growth factor receptor EGFR, and provide clear evidence that MT4-MMP controls EGFR phosphorylation and signaling. Clinically, MT4-MMP and EGFR expressions were correlated in human triple-negative breast cancer specimens (Cancer Res. 2014 Dec 1;74(23):6758-70) and was shown to be able to define a sub-population of TNBC sensitive to a combination of DNA-targeting chemotherapeutic agents and anti-EGFR drugs (British Journal of Cancer, 2017, 116, 742-751).



Confocal microscopy image showing EGFR and MT4-MMP complexes (red spots) revealed by the Proximity Ligation Assay in ZR-75-1 cells expressing naturally MT4-MMP and EGFR. Nuclei are stained with DAPI (blue).

Advantages

The innovative concept of an MT4-MMP/EGFR interplay offers a unique opportunity to develop a new approach to select patients that might benefit from anti-EGFR therapy. The Laboratory of Tumor and Development has developed reliable tools to screen for combined therapies and to perform a patient selection, as a first step towards personalized medicine.

Potential applications

Prediction of Triple Negative Breast cancers responsiveness towards anti-EGFR therapy
Selection for novel therapeutic strategies for Triple Negative Breast cancers
Transposition to other EGFR-dependent cancers (studies in progress)

Opportunities

Research Services, Research Collaboration, License Agreement

Patent Status

US9783615B2;

EP procedure pending (WO2014/037316)

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Research Team

The Laboratory of Tumor and Development Biology (LTBD) has a recognized expertise in the fields of matrix remodeling, extracellular proteolysis associated with cancer and inflammation, reproductive biology, (lymph)angiogenesis, steroid hormones (E2, E4), tumor microenvironment, metastasis and epithelial to mesenchymal transition (EMT).
The LTBD is a member of the GIGA Research Center of the University of Liege, Belgium.

Prof. Agnès Noël is Professor of Molecular Biology at the University of Liege, member of the Belgian Royal Academy of Medicine and past-President of the Belgian Society for Cell and Developmental Biology (BSCDB). She is co-heading — with Prof. J.-M. Foidart and Pr. D. Cataldo — the Laboratory of Tumor and Development Biology composed of 50 persons (2 staff, 8 postdocs, 25 PhD students, 9 technicians and numerous master and bachelor students). She is also Director of the GIGA-Cancer composed of 38 scientists and 57 PhD Students, since January 2012.

Dr. Nor Eddine Sounni is a Research Associate of the FNRS-FRS, Belgium and Assistant Professor in the Preclinical Science Department and GIGA-Cancer, University of Liege. He received his Ph.D. in Biomedical Sciences (University of Liege), in the laboratory of Pr. Agnes Noel and Pr. Jean-Michel Foidart in 2004. After completing two postdoctoral fellowships in Cancer Biology at UCSF, San Francisco, 2005-2008 and the Burnham Institute for Medical Research, La Jolla, (2008-2009), he joined the GIGA-Cancer in 2009 and developed its research team working on tumor microenvironment and cancer metabolism.

Contact

Dr. Annick Houbrechts
a.houbrechts@ulg.ac.be
Tel : +32 4 349 85 27

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