

# DIAGNOSIS AND/OR PROGNOSIS OF HER<sub>2</sub><sup>+</sup> CANCER USING ONE OR MORE MIRNA AS BIOMARKERS

New biomarkers for the diagnosis/prognosis of HER<sub>2</sub>-dependent breast cancer

**ERG\NEO**

L'AVENIR EST FAIT D'AUDACE

## PRESENTATION

About 25% of primary human breast cancers are due to the deregulated expression of ErbB2/HER2. HER2-targeted therapies have improved patient survival, but both de novo and acquired resistance remain a challenge, as only 25% of treated patients respond to the current therapies. Equivocal HER2 status also remains an issue as it affects subsequent clinical management. Following the analysis of the expression level of more than 800 miRNA in several human breast cancer cells and patient biopsies with various HER2<sup>+</sup> status, the team has identified novel miRNA biomarkers for the diagnosis and prognosis of HER2<sup>+</sup> cancers. This allows for further stratification of patients and offers new therapeutic strategies based on the modulation of miR-200b, -429 or -29c-3p. The team has the expertise and know-how required to measure miRNA and HER2 expression levels in biological samples as well as to assess HER2 activation status, downstream signaling and functional effects on cell proliferation and survival in breast cancer.

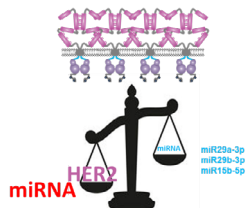
### PHYSIOLOGICAL CONDITIONS

Inactive HER2



### HER2<sup>+</sup> BREAST CANCERS

HER2 amplification


 miR429  
miR29a-3p  
miR200a-3p  
miR200b-3p  
miR200c-3p  
miR615-3p  
miR542-5p

 miR141-3p  
miR15a-5p  
miR18-5p  
miR424-5p  
miR487-5p  
miR451a

 ERBB2 - HER2<sup>+</sup> breast cancers - Patients stratification

MiRNA Diagnostic/prognostic

Biomarkers Equivocal HER2 status

## COMPETITIVE ADVANTAGES

- New biomarkers to stratify breast cancer patients with equivocal HER2<sup>+</sup> status (4-12% cases)
- New biomarkers to evaluate HER2<sup>+</sup> breast cancer prognosis.
- MiRNAs expression level assessed with non-invasive techniques

## APPLICATIONS

- Diagnosis of HER2<sup>+</sup> breast cancer
- Evaluation of the prognosis of HER2<sup>+</sup> breast cancer patients
- Novel HER2-targeted therapy based on miRNA modulation

## DEVELOPMENT PHASE

- Bio-informatic analysis showing positive correlation between MiR-429, 29c-3p, 200bc-3p and HER2 expression levels in breast cancer cell lines.
- Kaplan-Meier analysis showing poor prognosis associated with high miR29c-3p, -200b, -429 expression levels.
- In vitro validation of the loss of function of miR-200b, -429 or -29c, showing reduced cell proliferation and apoptosis induction of HER2<sup>+</sup> cancer cells.

## CONTACT

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## INTELLECTUAL PROPERTY

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