

Research proposal:

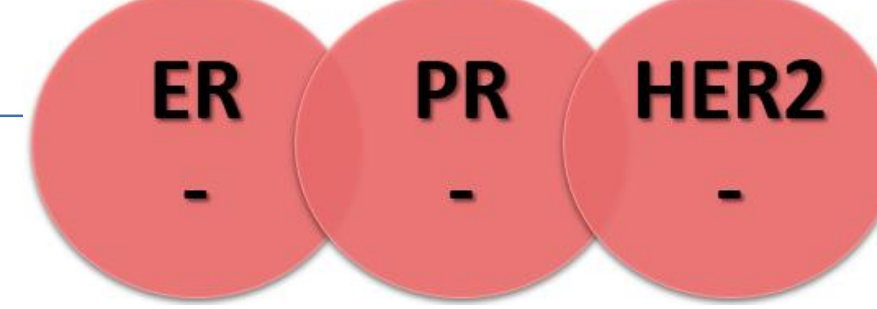
EXOSOMES AS NANOCARRIERS FOR ANTI-MIR-21 IN TRIPLE NEGATIVE BREAST CANCER

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BACKGROUND

Triple Negative Breast Cancer (TNBC) constitutes approximately 15-20% of all breast cancer's diagnosis and is considered as the breast cancer subtype with the worst prognostic. It is characterized by not expressing estrogen receptors (ER), progesterone receptors (PR) nor the human epidermal growth factor receptor 2 (HER2). Nowadays, TNBC's treatments have been a challenge due to the lack of targeted therapies and the heterogeneity that presents this subtype of breast cancer.

miRNAs' aberrant expression has been associated with human carcinogenesis, in particular, many studies correlate high expression levels of miR-21 with the suppression of apoptosis events and the metastasis development in TNBC. The knowledge of miRNAs has open the field for therapies based on modification of miRNAs' expression levels.



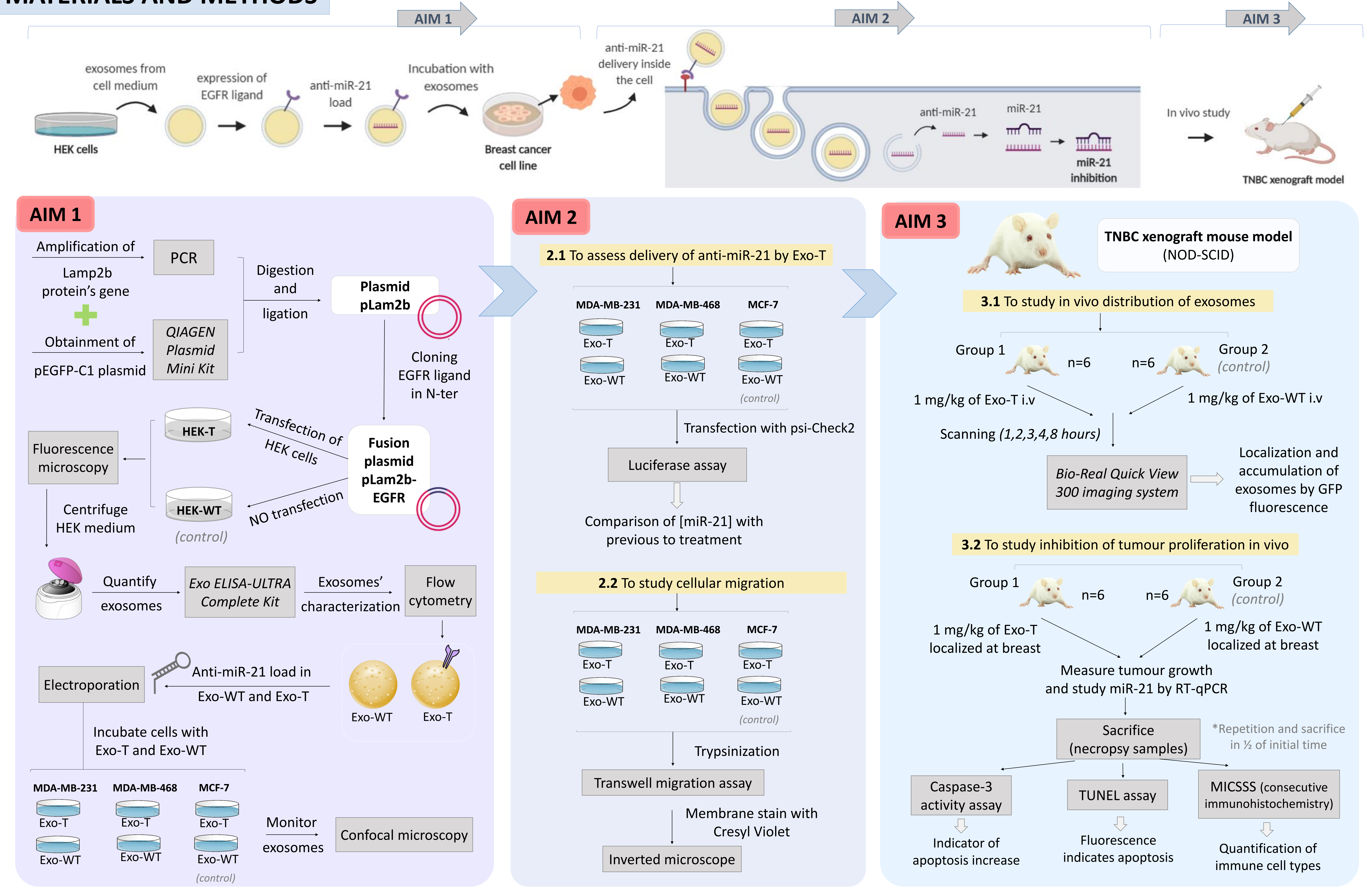
HYPOTHESIS AND OBJECTIVES

The proposed hypothesis is that the use of exosomes as nanocarriers is a therapeutic tool for miR-21's expression decrease, a necessary factor to reduce tumour cells' proliferation in triple negative breast cancer.

The objectives for the hypothesis development are:

- 1 To generate modified exosomes from the transfection of epithelial cells and to monitor their caption through breast cancer cell lines.
- 2 To study miR-21's expression in breast cancer cell lines and to asses derived changes of modified exosomes introduction.
- 3 To assess modified exosomes' efficacy in a mouse model xenograft of TNBC.

MATERIALS AND METHODS



EXPECTED RESULTS

- 1 Engineered exosomes are expected to target specifically breast cancer cell lines and been internalized properly by the cells.
- 2 miR-21's expression levels are expected to decrease after the use of engineered exosomes, containing anti-miR-21, and is expected to be seen an increase of apoptosis events so as to reduce breast cancer cells' proliferation derived from its use.
- 3 Xenograft of TNBC mouse model is expected to exhibit higher reduction of breast cancer cells' proliferation.

DISSEMINATION PLAN

- Scientific dissemination → for basic and translational cancer research professionals.
 - Publications in high-impact journals of this area.
 - Presentation of results in national and international conferences.
- Community dissemination → digital dissemination for general public.
 - Press releases and media interviews.
 - Creation of social media and project webpage.



FUTURE PERSPECTIVES

If the outcome of this approach of treatment is positive, it will be considered to assess a mix of different miRNAs involved in tumour proliferation.

RELEVANT REFERENCES

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