

# Targeting oncogenic microRNAs in Triple Negative Breast Cancer using CRISPR/cas9 approach

Diana Sousa <sup>1\*</sup>, Fátima Baltazar <sup>2,3</sup>, Lígia R. Rodrigues <sup>1</sup>

<sup>1</sup> Centre of Biological Engineering, University of Minho, Braga, Portugal

<sup>2</sup> Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho, Braga, Portugal


<sup>3</sup> ICVS/3B's – PT Government Associate Laboratory, Braga/Guimarães, Portugal

\* Corresponding autor: [sousa.diana93@gmail.com](mailto:sousa.diana93@gmail.com)

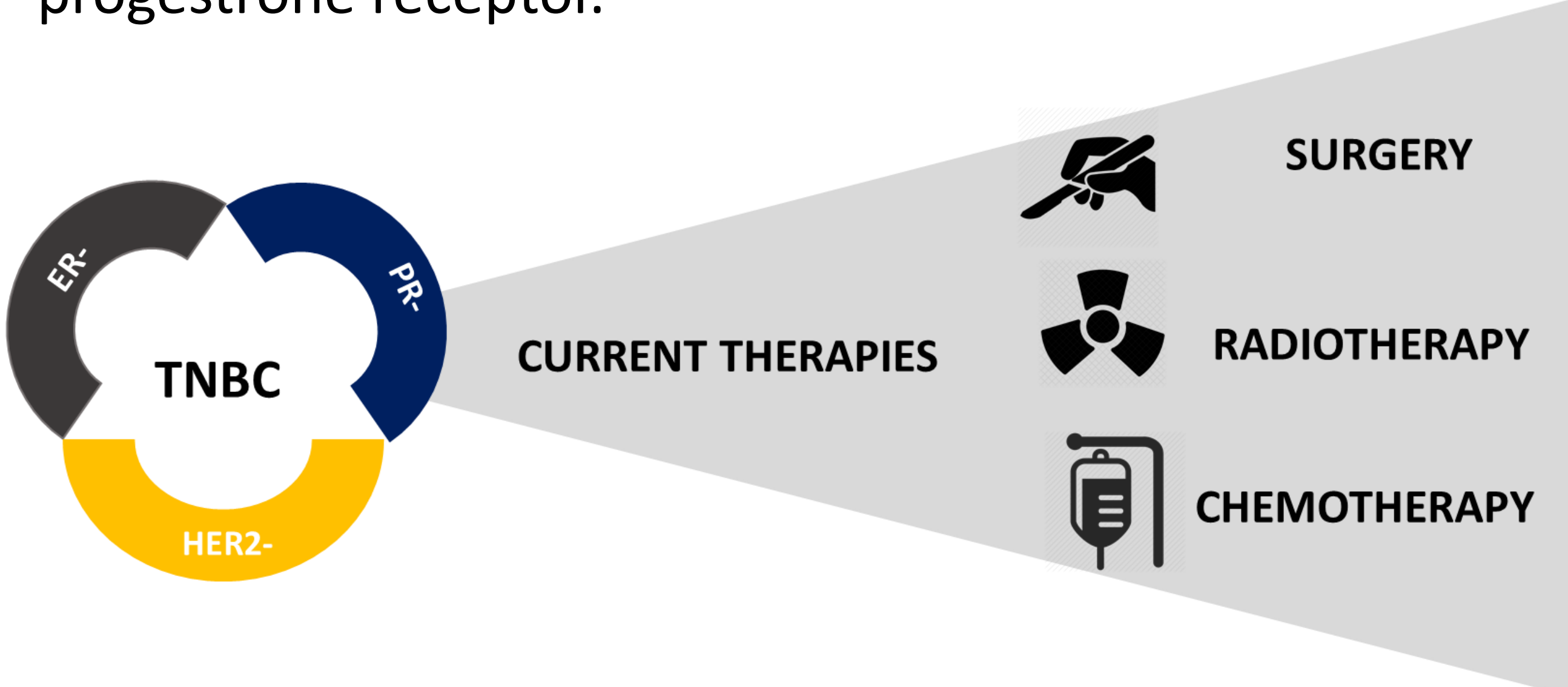
MIT Portugal Annual Conference - Lisbon, October 1<sup>st</sup>, 2018

## INTRODUCTION

Triple negative breast cancer (TNBC) represents **15-20%** of breast cancer cases (about 2 out of every 10 cases).

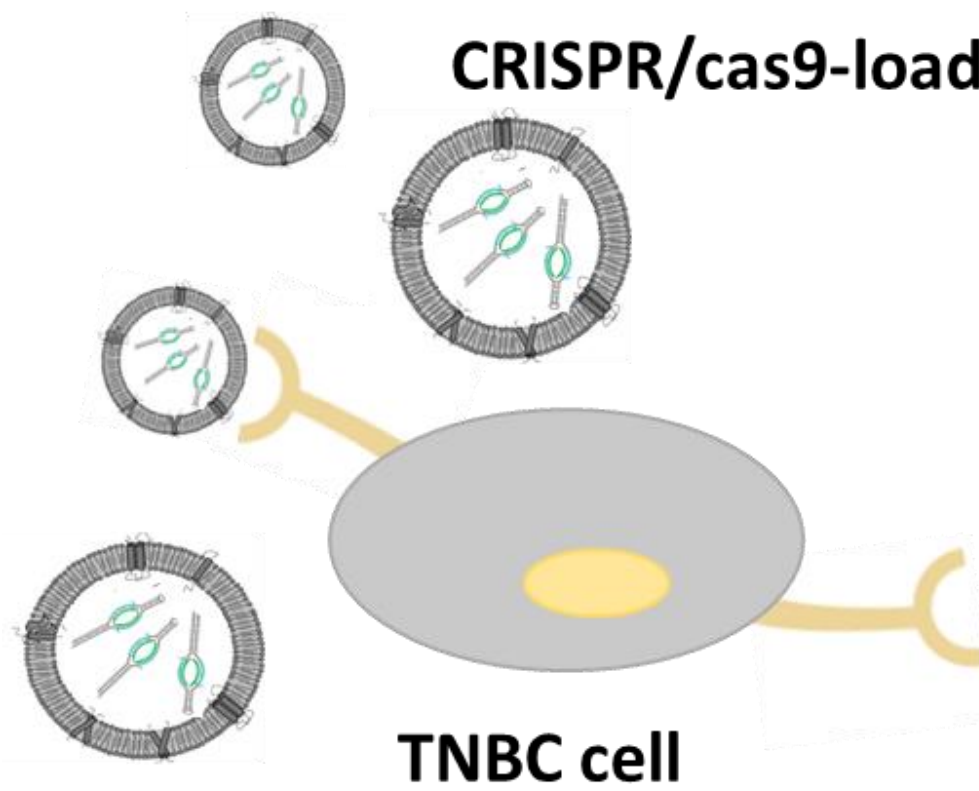


Characterized by the absence of three biomarkers: human epidermal growth factor receptor 2, estrogen and progesterone receptor.



Treatment is a major clinical challenge due to lack of targeted therapy

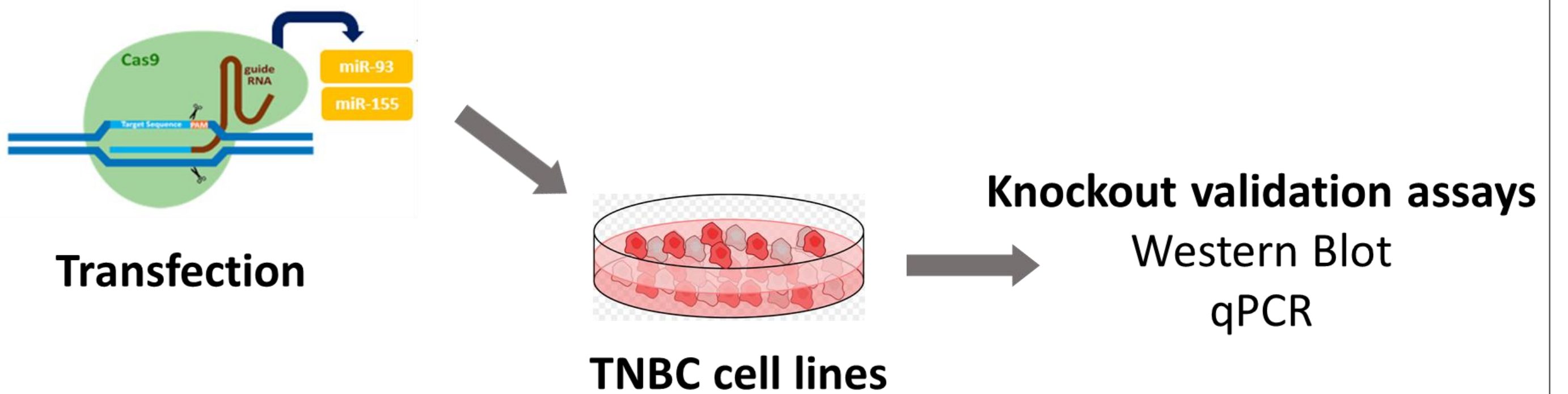
## MAIN GOAL



**Efficient TNBC therapy** comprising of exosomes loaded with CRISPR/cas9 system against oncogenic microRNAs

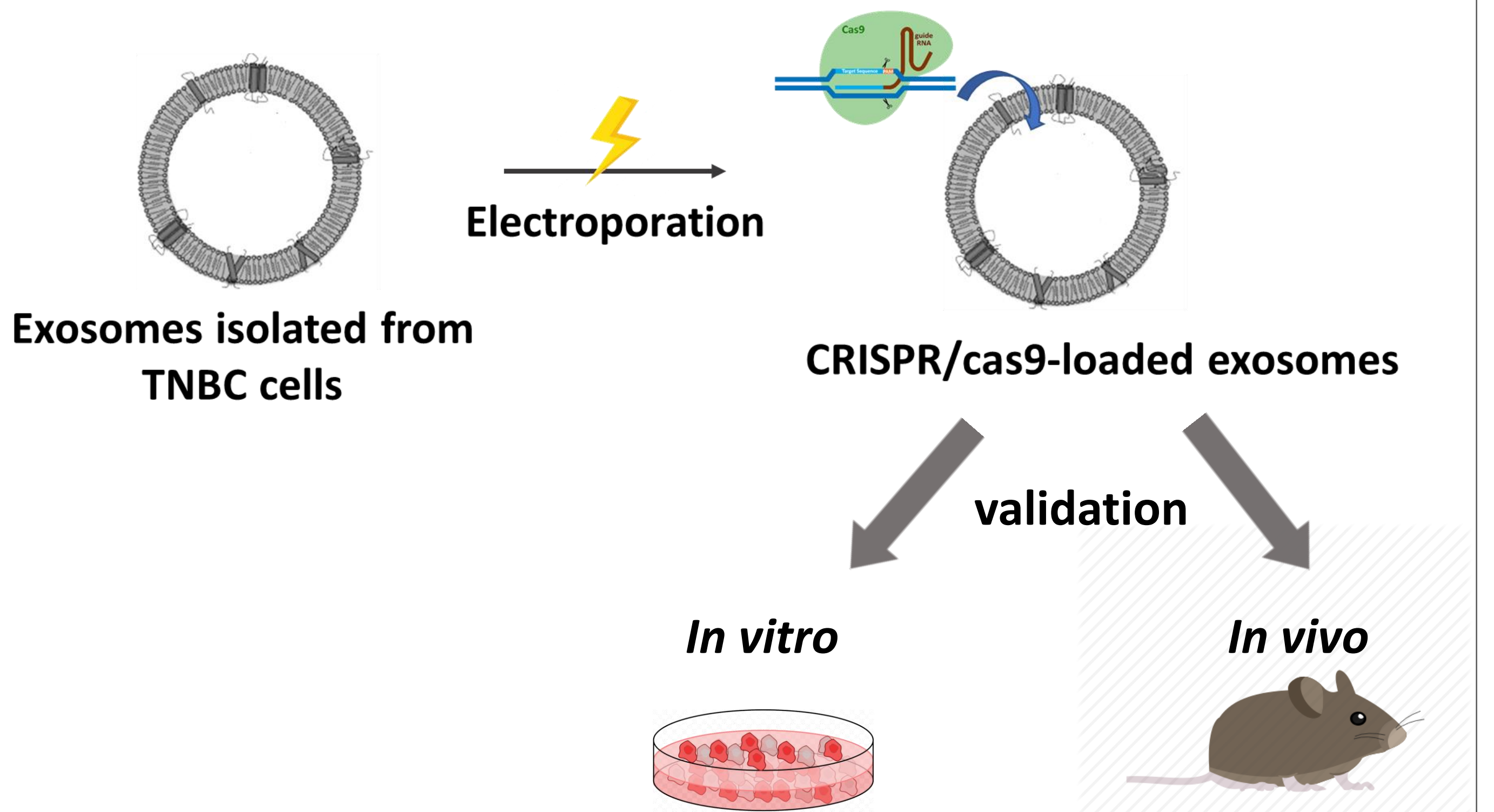
## OBJECTIVES

**Construction of CRISPR/cas9 system** against microRNAs upregulated in TNBC cases.



Transfection of CRISPR/cas9 system to **knockout oncogenic microRNAs in TNBC cells.**

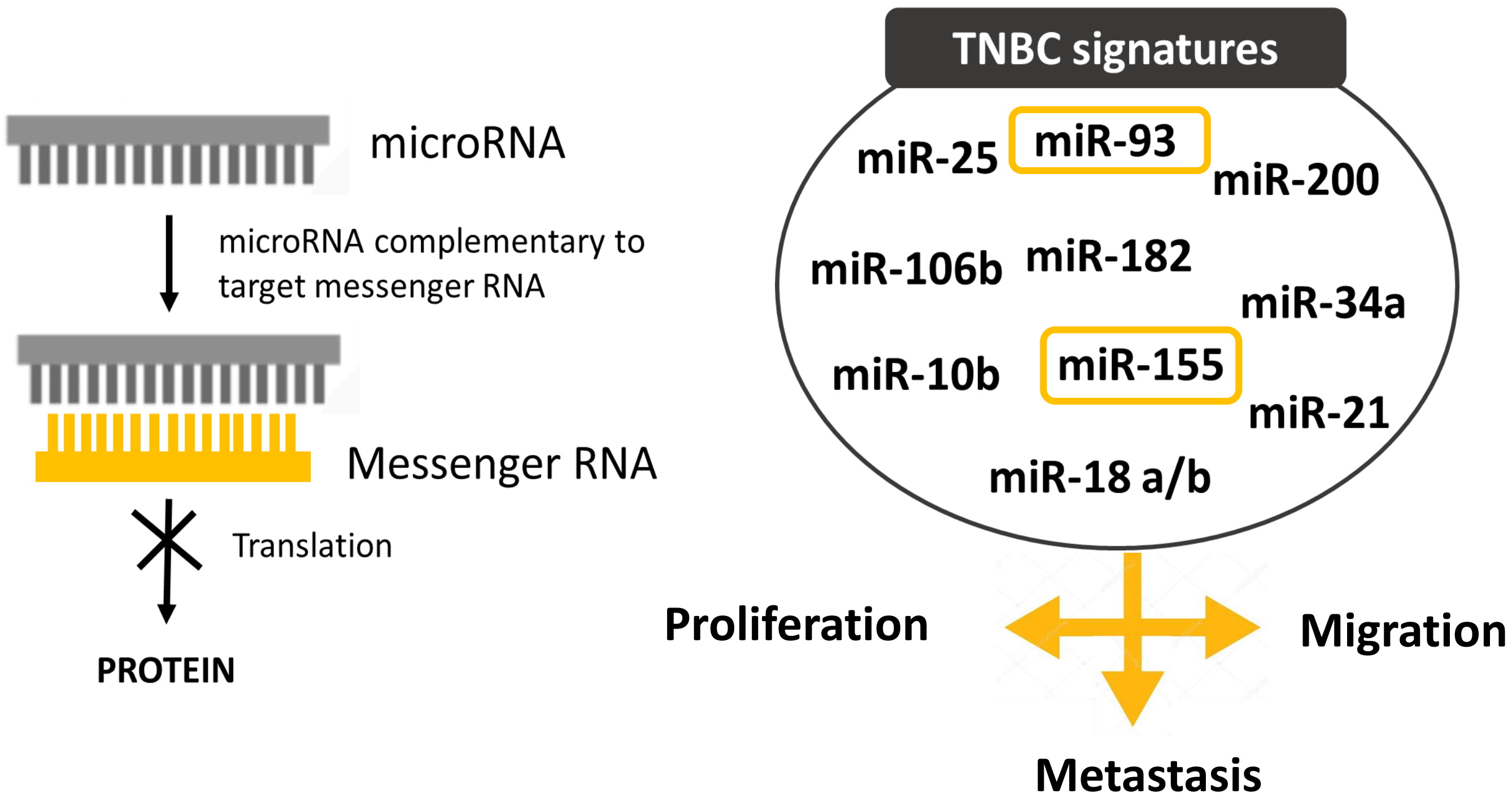
**Incorporation of CRISPR/cas9 system in exosomes** to improve intracellular delivery.



**Access efficiency knockout of CRISPR/cas9-loaded exosomes in vitro and in vivo**

## METHODOLOGIES

Dysregulation of microRNAs was involved in the initiation of oncogenesis. Many **microRNAs have been associated to TNBC due to their overexpression** in this cancer subtype.



**CRISPR/cas9 is a powerful genome-editing tool able to knockout the expression of oncogenic microRNAs**

Exosomes as a delivery platform of CRISPR/cas9 system in TNBC

## REFERENCES

[1] X. Dai, L. Xiang, T. Li, and Z. Bai, "Cancer Hallmarks, Biomarkers and Breast Cancer Molecular Subtypes," *J. Cancer*, vol. 7, no. 710, pp. 1281–1294, 2016.

[2] X. Mao, P. Shi, B. He, K. Xu, S. Zhang, and J. Wang, "MicroRNAs in the prognosis of triple-negative breast cancer," vol. 0, no. January, 2017.

[3] J. Zhang, S. Li, L. Li, M. Li, C. Guo, J. Yao, and S. Mi, "Exosome and Exosomal MicroRNA: Trafficking, Sorting, and Function," *Genomics. Proteomics Bioinformatics*, vol. 13, no. 1, pp. 17–24, Feb. 2015.