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Role of *H19* and the miR-675 in breast cancer tumor development and development of brain metastasis

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¹ Univ. Lille, CNRS, Inserm, CHU Lille, UMR9020-U1277 - CANTHER – Cancer Heterogeneity Plasticity and Resistance to Therapies, F-59000 Lille, France



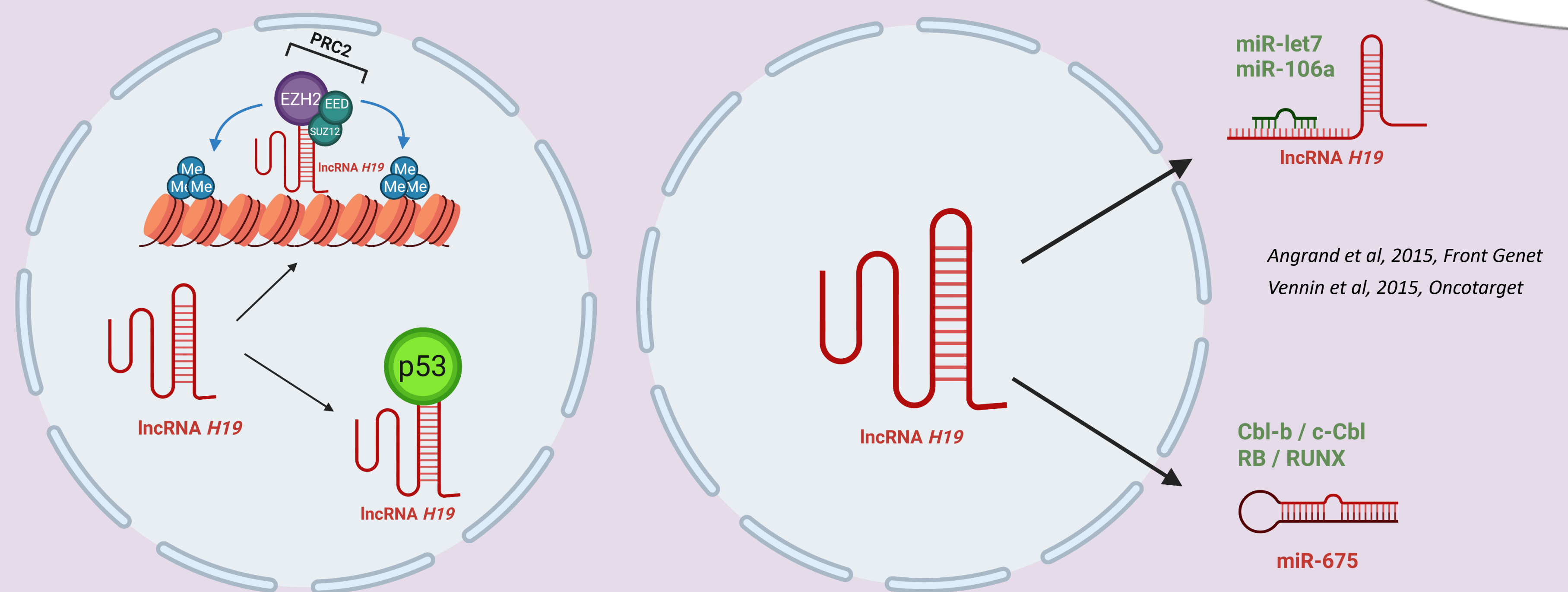
1 The long non-coding RNA *H19* in cancer



H19 is involved in all cancer hallmarks

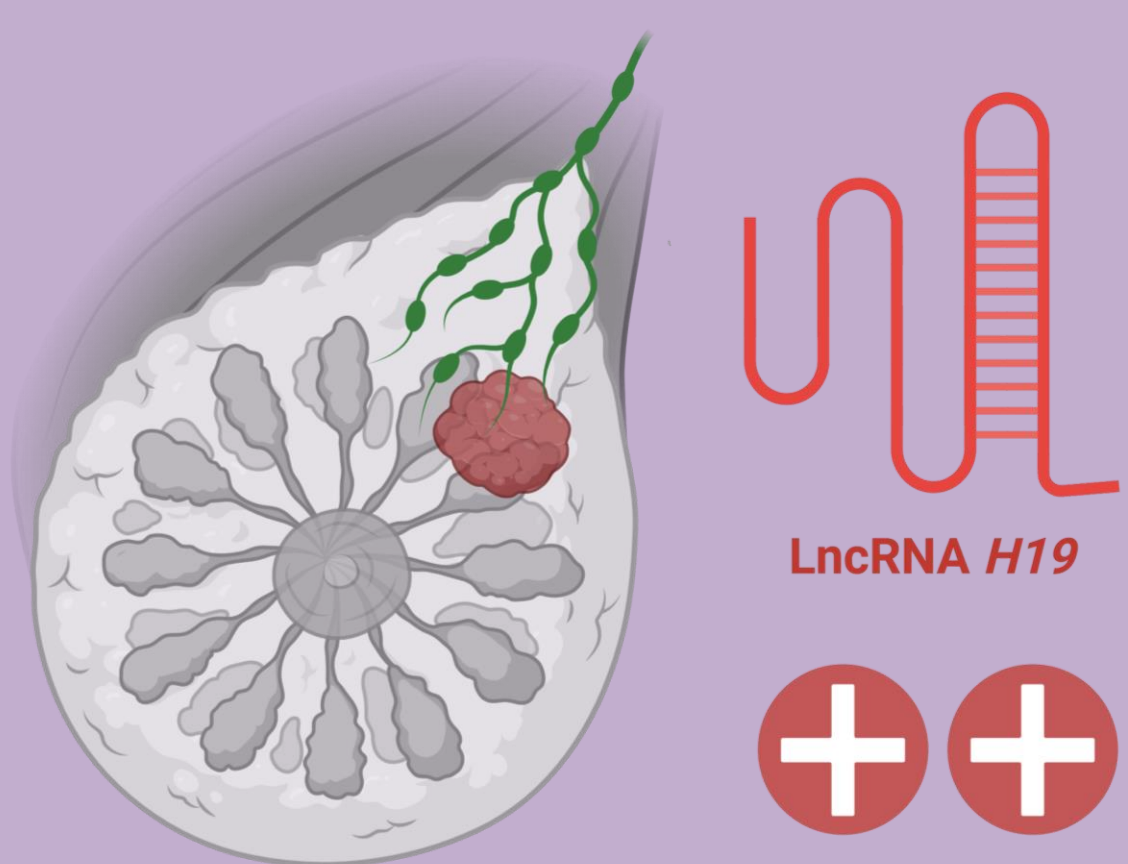
Hanahan and Weinberg, 2011, Cell
Lecerf et al, 2018, Cell, CMLS

2 Mechanisms of action that promotes breast cancer



H19 can interact with proteins like PRC2 complex or p53. It can also synthesize the miR-675 to target genes such as Cbl-b or capture other miRNAs like the let-7 family members.

3 Context and aims

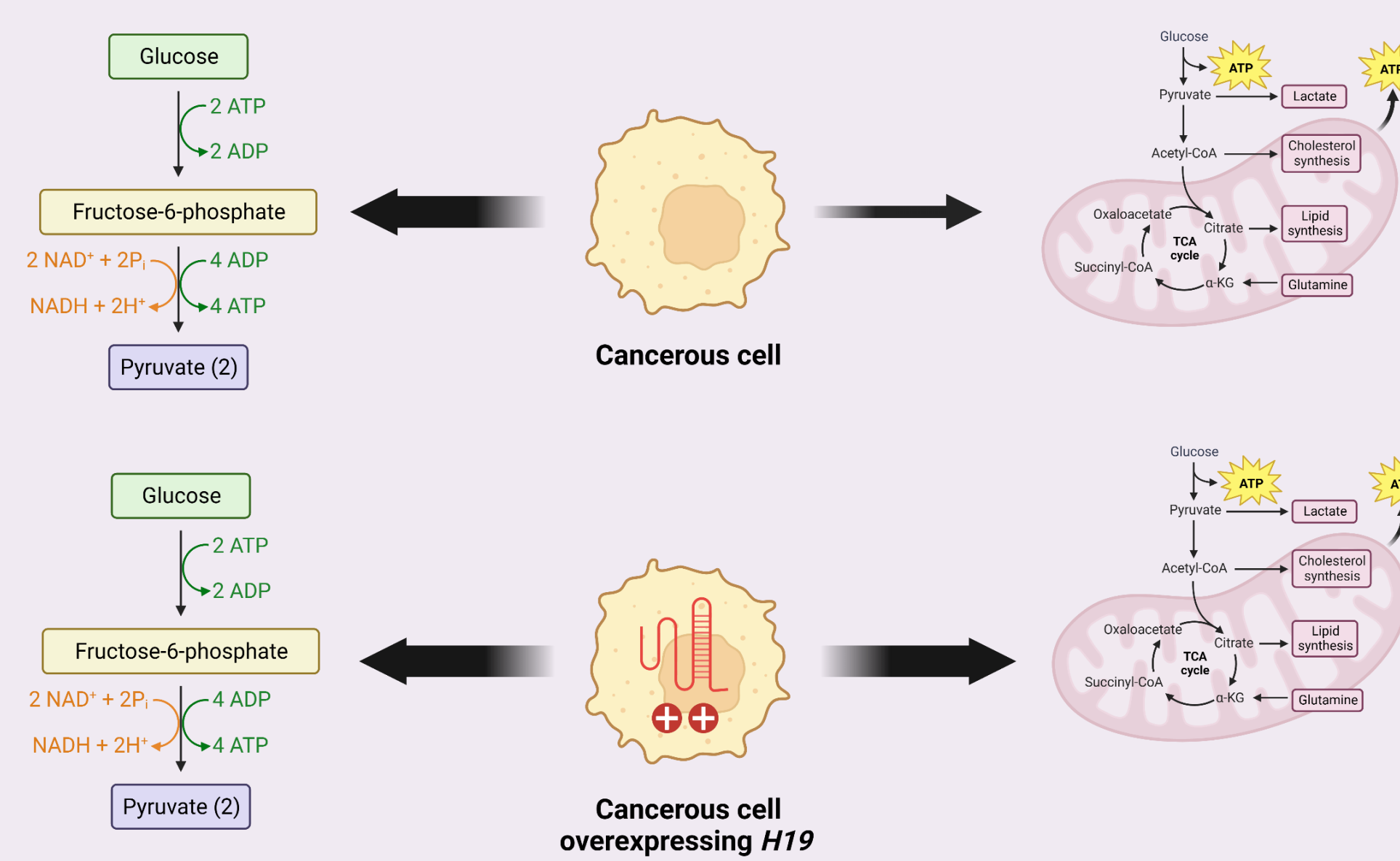


Overexpression of *H19* in 70% of breast cancer¹

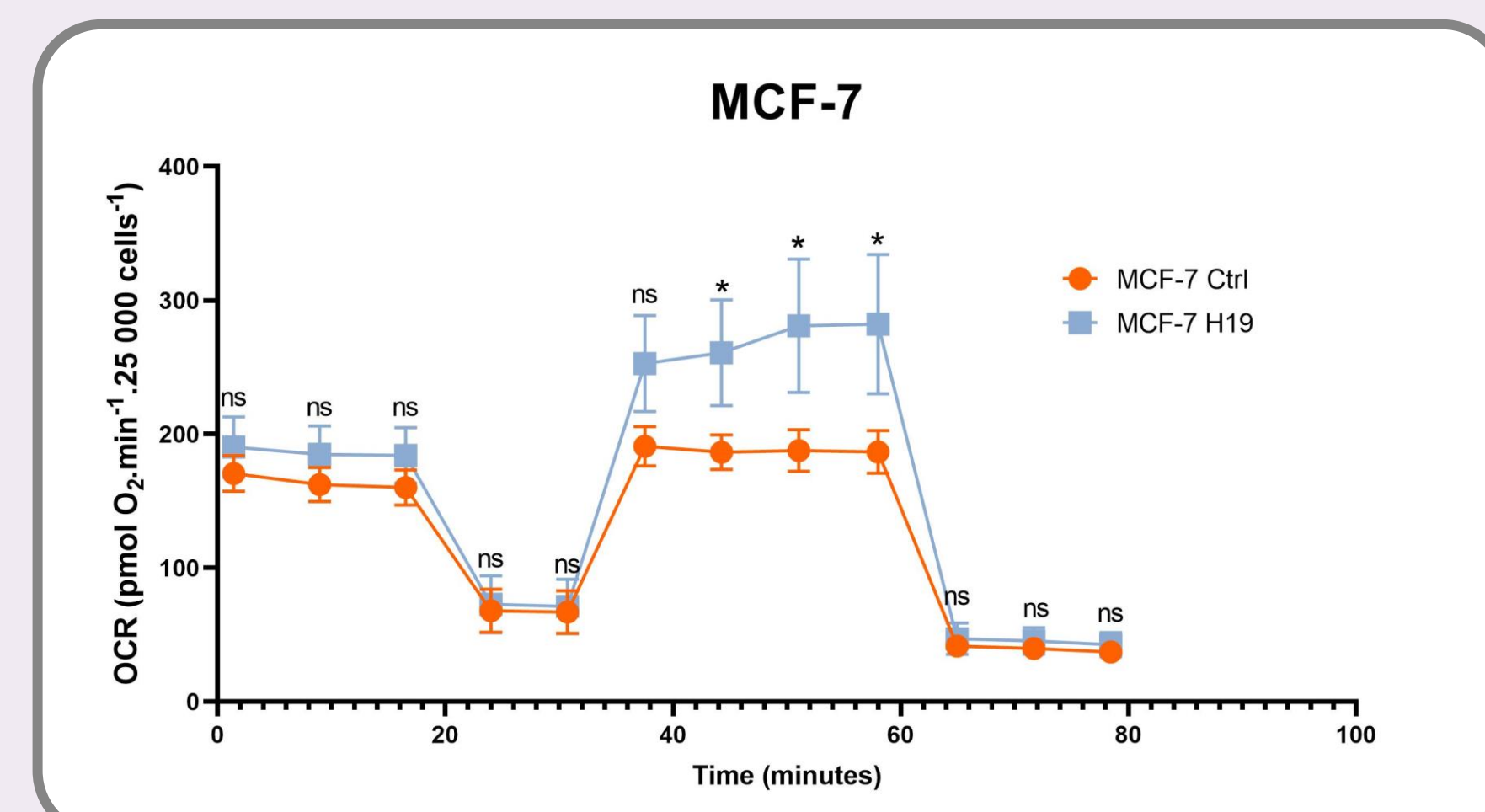
- 1. Metabolism deregulation**
Effect of *H19* and miR-675 overexpression on glycolysis and mitochondrial respiration
- 2. Brain metastasis formation**
Effect of *H19* overexpression in cell capacity to cross the BBB and growth in brain parenchyma
- 3. Breast cancer aggressiveness**
Effect of *H19* and miR-675 overexpression in phenotypes associated with tumor aggressiveness such as epithelial-mesenchymal transition, migration and invasion.

¹Adriaenssens et al, 1998, Am. J. Pathol

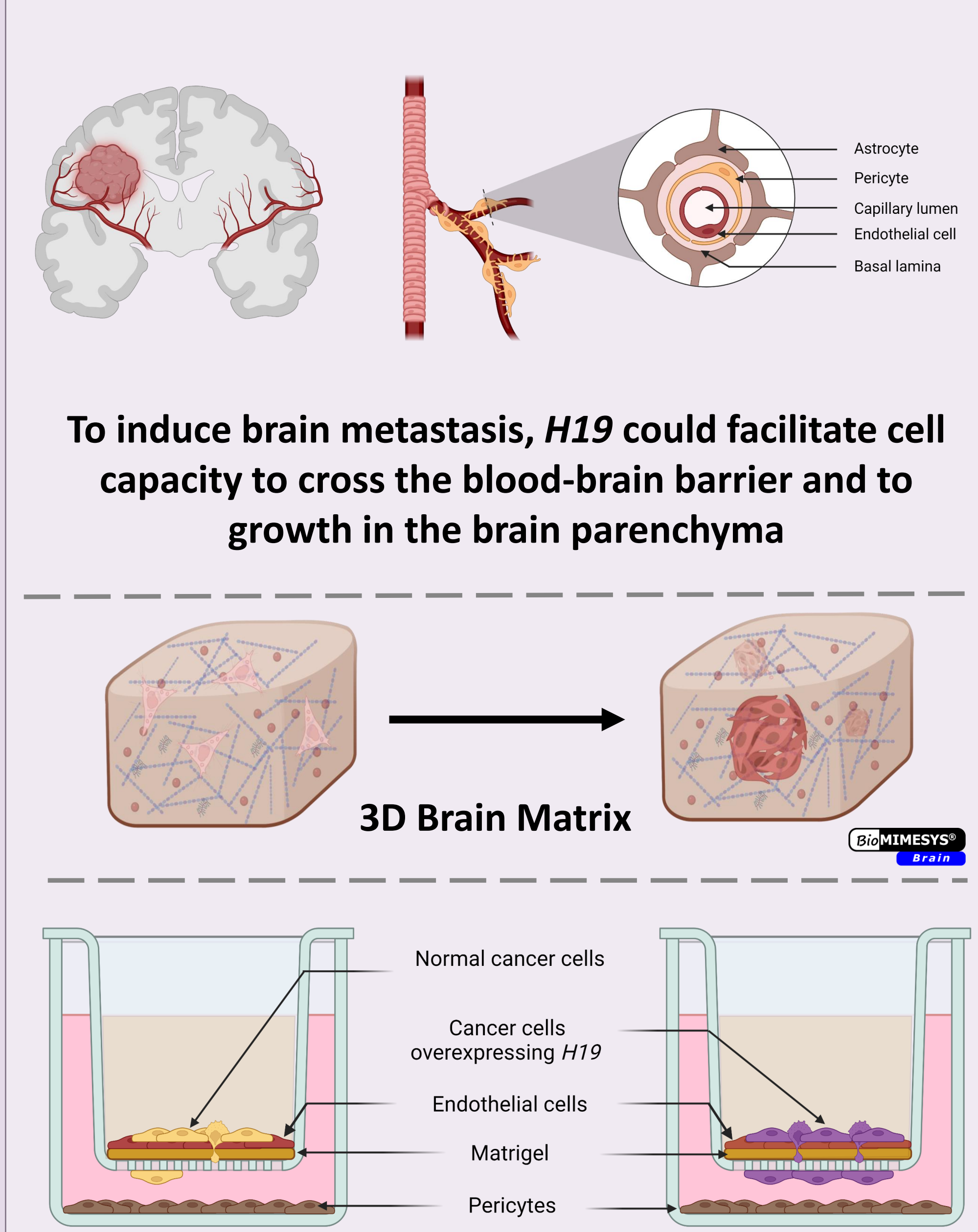
4 Metabolism deregulation



Overexpression of *H19* could induce an increase of mitochondrial respiration in breast cancer cells

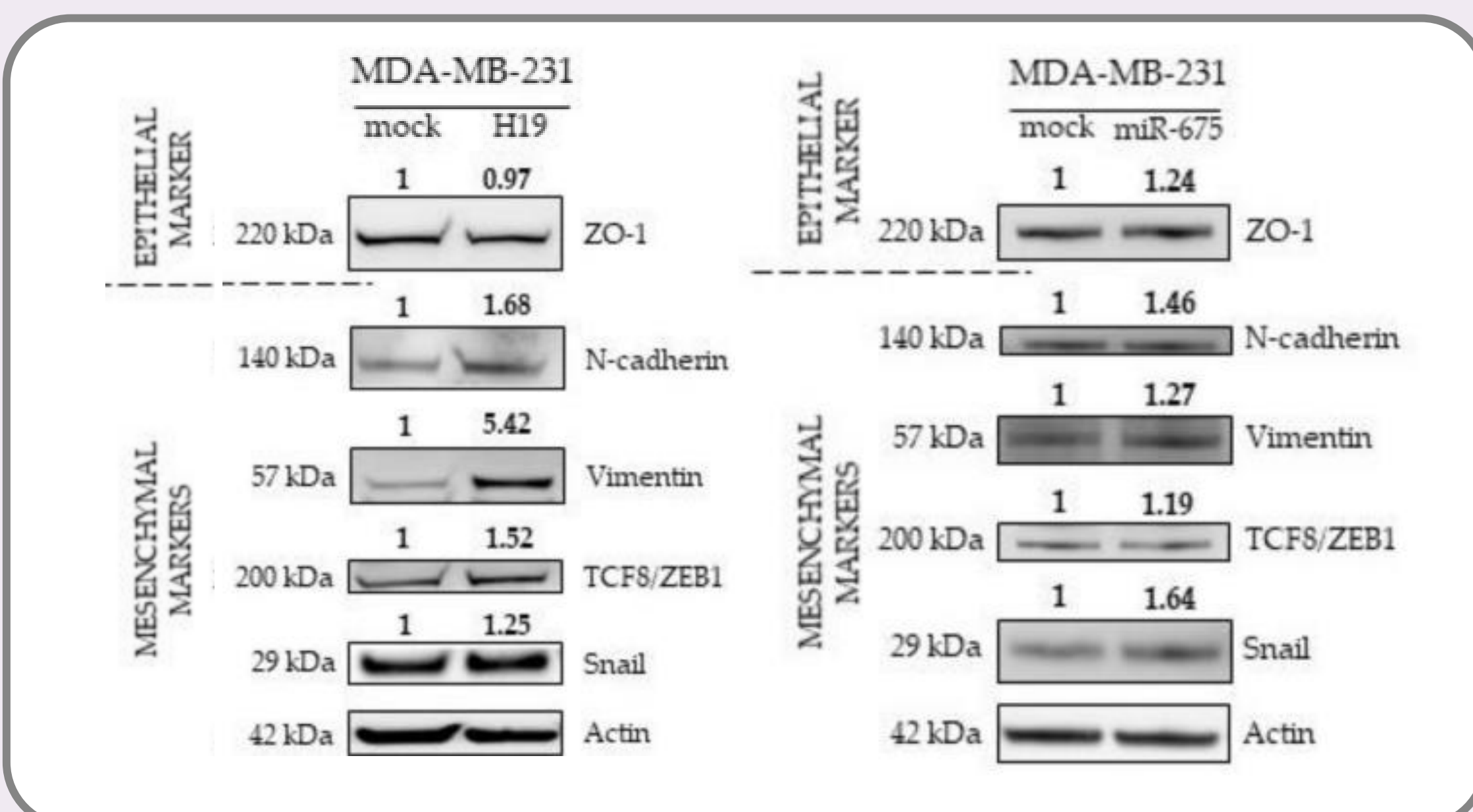


6 Brain metastasis formation



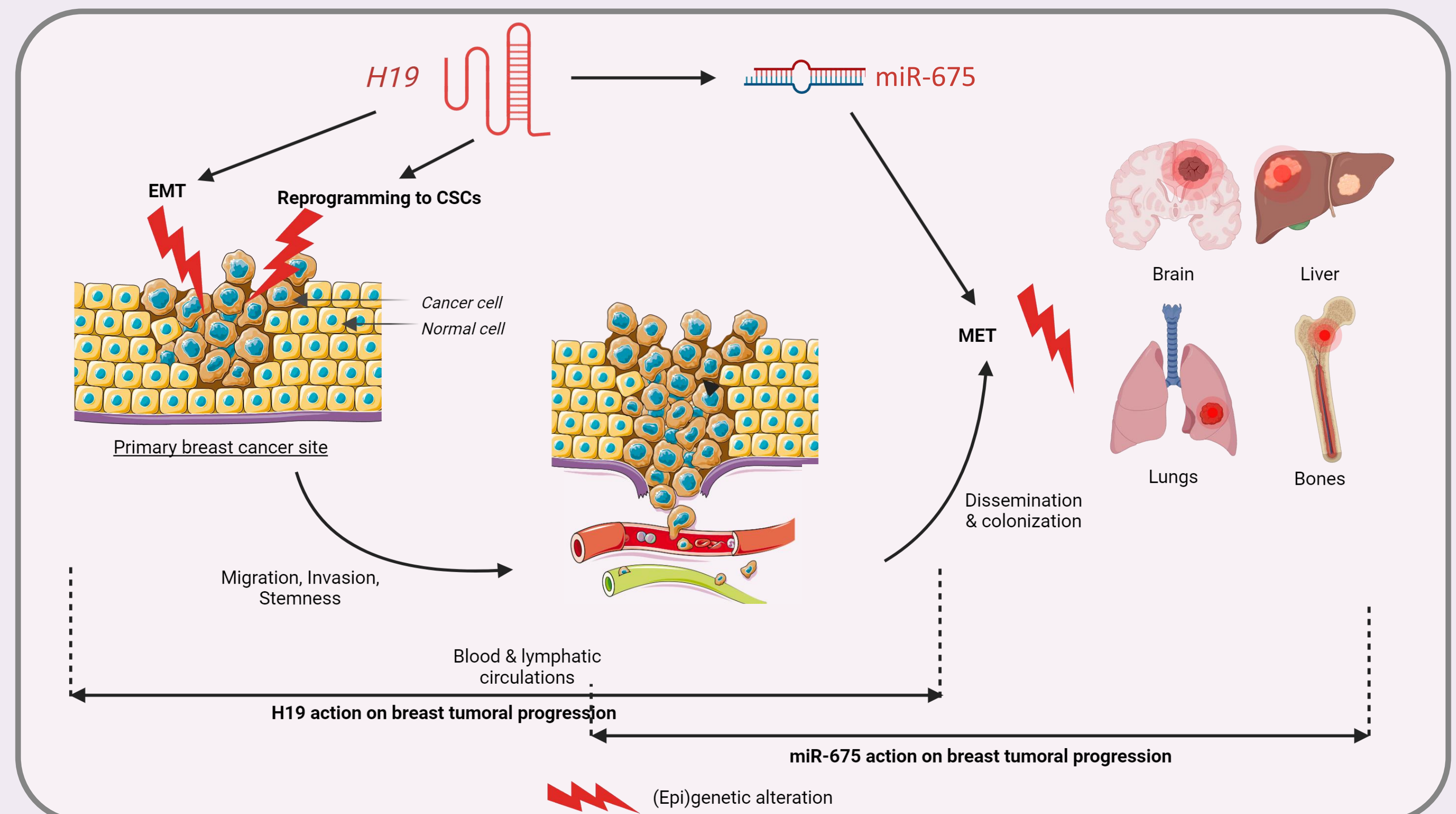
To induce brain metastasis, *H19* could facilitate cell capacity to cross the blood-brain barrier and to grow in the brain parenchyma

4 Breast cancer aggressiveness



H19 and miR-675 promotes breast cancer through different mechanisms²

²Peperstraete et al, 2020, Cancers



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