V-0134

The role of plasticity ratio (PR) in differentiating between metastatic and tumorigenic properties, both in cell lines and patient tumor samples.

MESTASTOP SOLUTIONS
Giving Life a Second Chance...

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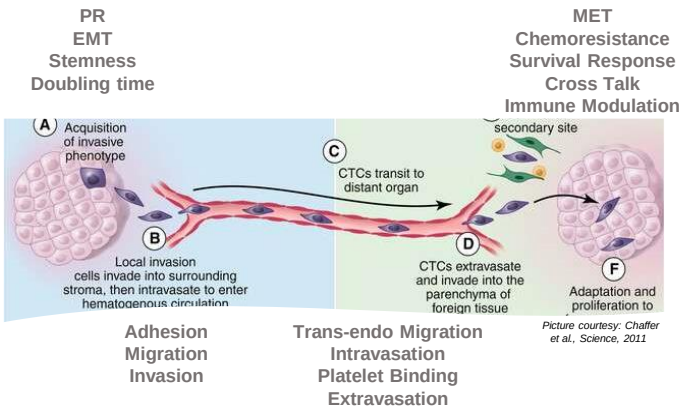
Introduction

The relevance of epithelial to mesenchymal transition (EMT) and mesenchymal to epithelial transition (MET) has long been of interest and debate[1], but with the emerging concept of hybrid[2] or partial EMT[3] it is clear that the E-M axis determines and defines functional properties that might drive metastasis.

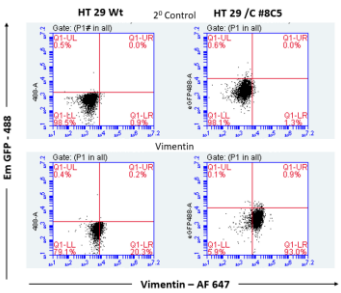
Here we propose that the net position of a cell on the E-M axis can be represented by plasticity ratio (PR; the ratio of mesenchymal to epithelial markers), which gives a true representation of a given cell's tumorigenic and metastatic potential.

Materials & Methods

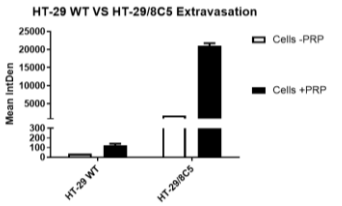
Complex Metastasis biology broken down into multiple steps:



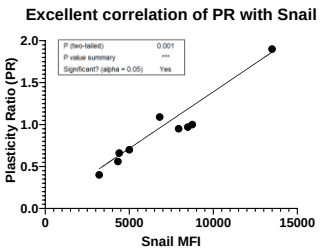
Genetic engineering to generate cells with different PR:

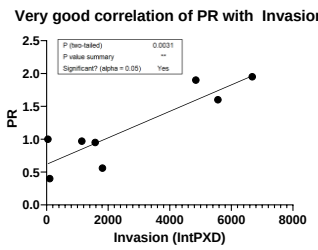


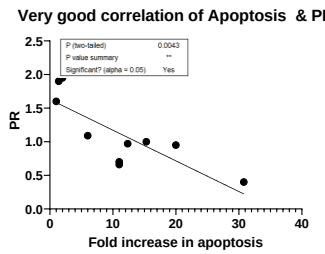
Name	E – cad (T)	Vim (T)	PR
HT 29	93.6	20.5	0.22
HT 29 / C # 8C5	98	93.9	0.96

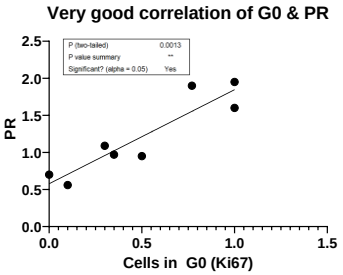


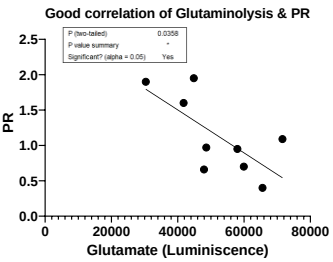
PR status can explain multiple cellular behaviors, e.g. dormancy, growth or spreading:

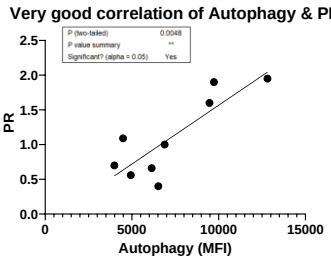


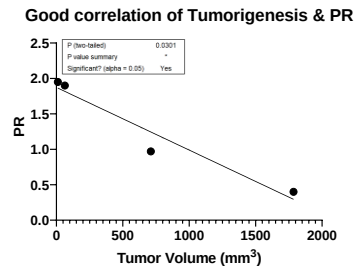


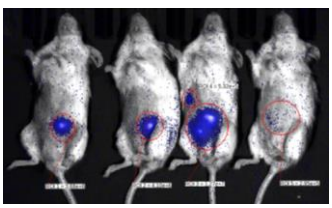








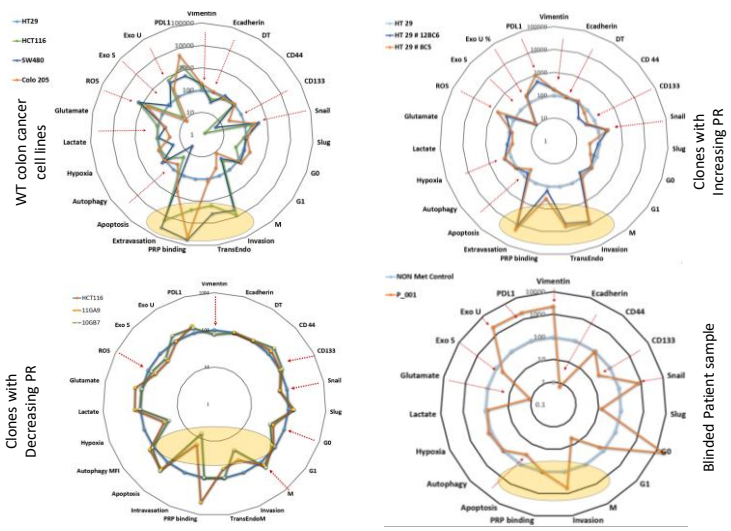




Orthotopic Model – Tumor with high PR (HT29#12BC6) shows liver metastasis in 7 days

Results

Comparative analysis of cells with different PR:



Conclusion

Cellular functional properties are correlated with PR and can explain metastasis and tumorigenesis. This can be further explored for drug discovery, drug repurposing and predictive metastasis diagnostics.

References:

1. *Trends in Cell Biology, 2020, 30, 764-776*
2. *Nature, 2018, 556, 463-468*
3. *Cell, 2016, 166, 21-45*

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Disclaimer:

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