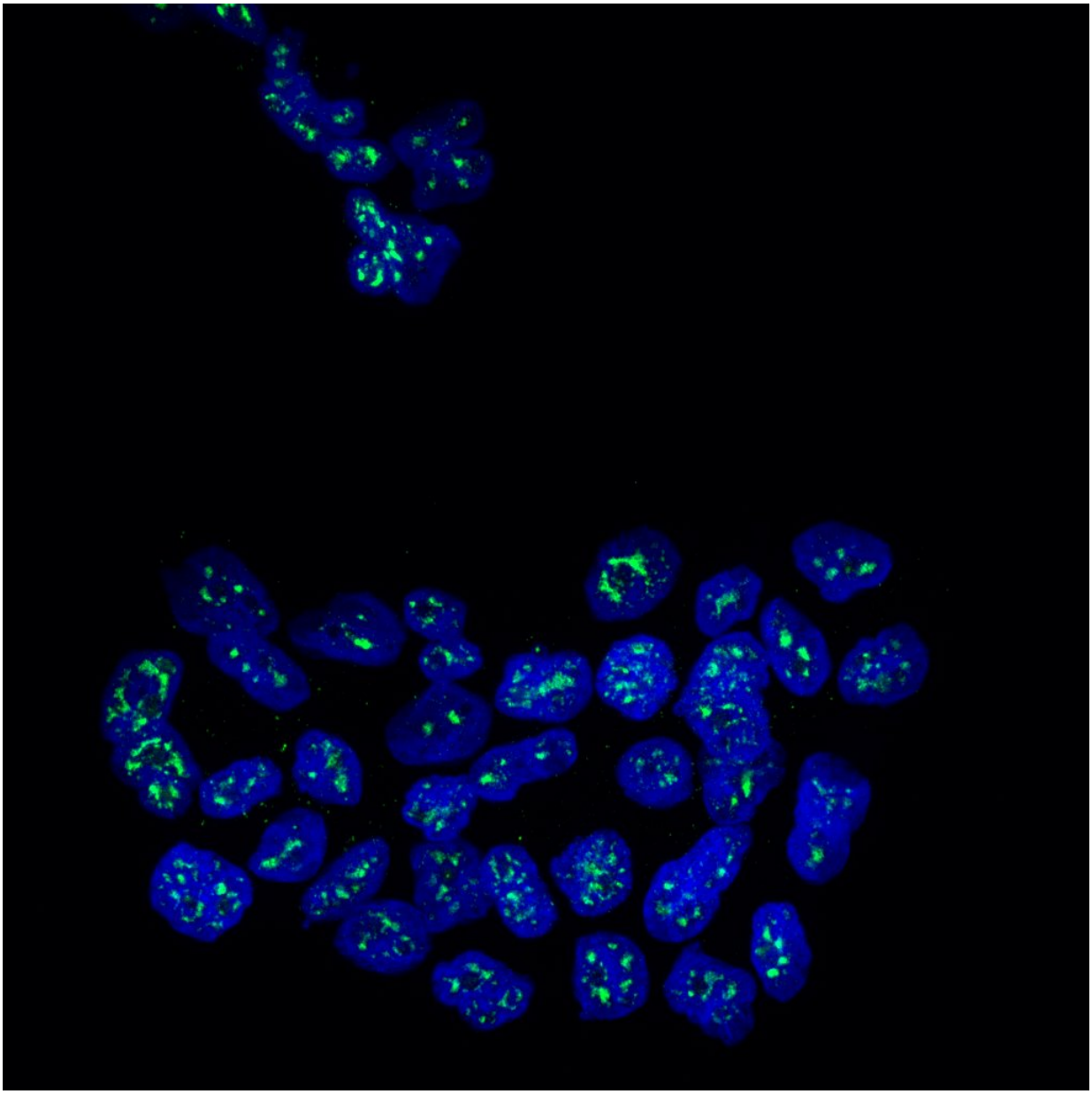
Researchers identify a protein that keeps metastatic breast cancer cells dormant

January 23 2018



Nuclei of metastatic breast cancer cells showing the protein MSK1 in green. Credit: Cristina Figueras-Puig, IRB Barcelona

A study headed by ICREA researcher Roger Gomis at the Institute for Research in Biomedicine (IRB Barcelona) has identified the genes involved in the latent asymptomatic state of breast cancer metastases. The work sheds light on the molecular basis underlying how the expression of certain genes facilitates the spread of metastatic lesions.

The time needed for breast cancer metastases to develop varies between patients, and little is known about the mechanisms that govern latency. A study headed by ICREA researcher Roger Gomis at the Institute for Research in Biomedicine (IRB Barcelona) has identified the genes involved in the latent asymptomatic state of breast cancer metastases. The work sheds light on the molecular basis underlying how the expression of certain genes facilitates the spread of metastatic lesions.

The team has studied estrogen-positive (ER+) breast tumours, which are the most common, accounting for 80 percent of breast cancer tumour cases. They were interested in tumours characterised by a long period of latency with no symptoms. The study has been published in *Nature Cell Biology*.

MSK1, the protein that keeps tumour cells dormant

The team identified the protein kinase MSK1 as a key regulator of dormant or latent metastases. Using clinical samples from patients, the scientists confirmed that ER + breast cancer tumours that do not express MSK1 are associated with a risk of earlier relapse, while those that express it will form metastases later. "We are interested in understanding the mechanisms underlying metastasis and the time component of this

process. Until now, little was known in preclinical models about the mechanisms that allow breast cancer cells to leave the latent state and even less is known in patients," says Roger Gomis, head of the Growth Control and Cancer Metastasis Lab.

The researchers believe that in the future this discovery may benefit patients in two ways. Firstly, it will help to identify those with an imminent risk of relapse and to adjust the treatment for this prognosis. Secondly, attempts could be made to design a treatment to mimic the function of MSK1 kinase, with the aim to maintain metastatic lesions in a latent and asymptomatic state for as long as possible.

More information: MSK1 regulates luminal cell differentiation and metastatic dormancy in ER+ breast cancer, *Nature Cell Biology* (2018). nature.com/articles/doi:10.1038/s41556-017-0021-z

Provided by Institute for Research in Biomedicine (IRB Barcelona)