HEIDELBERG, 18 September 2013 – A research team led by scientists from VIB/KU Leuven, Belgium, and the University of Rome Tor Vergata, Italy, in collaboration with several research centers and hospitals in Italy, the United Kingdom and, Belgium, has identified the way Fragile X Mental Retardation Protein or FMRP contributes to the progression of breast cancer. The researchers demonstrated that FMRP acts as a master switch controlling the levels of several proteins involved in different stages of aggressive breast cancer, including the invasion of cancer cells into blood vessels and the spread of these cancer cells to other tissues. The work is published on-line in *EMBO Molecular Medicine.*

The authors identified high levels of FMRP in human breast cancer tissue microarrays and also examined the effects of FMRP levels in a mouse model to study breast cancer. In these mice, high levels of FMRP in primary breast cancer tumours were also linked to the spread of the cancer to the lungs and the development of secondary metastasis; in contrast, reduction of FMRP led to a decrease in metastasis.

The role of FMRP is well known in the brain, where its absence leads to Fragile X Syndrome, the most prevalent form of inherited intellectual disability in humans. The present study explored the direct relationship between the levels of FMRP and the progression of breast cancer.

“Previous studies indicated that patients with Fragile X Syndrome had a decreased risk of developing cancer but little is known about the molecular events that lead to this beneficial effect. We showed that high levels of the FMRP protein in human breast tissue samples are linked to increased risk of breast cancer and the spread of the disease to other tissues throughout the body,” EMBO Member Claudia Bagni from VIB/KU Leuven, Belgium, and the University of Rome, Italy, who led the study, remarked. “Our results suggest that FMRP acts as a master regulator of a large group of mRNAs that are involved in multiple steps of cancer progression”.

The researchers suggest that the levels of FMRP might be used as an indicator of aggressive breast cancer and could be used to predict the likelihood of the spread of cancer to other

organs like the lung. In the study, the authors found that FMRP levels correlate with the highly aggressive Triple Negative Breast Cancer. Breast cancer is the most common form of cancer in women and has a poor prognosis. It often comes back years after treatment and spreads throughout the body.

The Fragile X Protein binds mRNAs involved in cancer progression and modulates metastasis formation

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