Prostate cancer is currently the second highest diagnosed cancer in men worldwide. While the primary tumour is able to be removed and treated effectively, progression into advanced metastatic forms reduces the 5-year survival rate to less than 30%. This indicates the need to identify or understand biological phenomena and biomarkers that mediate the phenotype for treatments and diagnostic reasons.

An important biomarker in cancer progression is caveolin-1. In healthy human cells, this is usually co-localised and co-expressed with tumour suppressor, cavin-1. However, in many cancer types, caveolin-1 is expressed without cavin-1, which has been attributed to most of the hallmarks of cancer progression. Yet, adding cavin-1 to a cell line that contains this activity, such as the advanced prostate cancer cell line PC3, is able to reduce the metastatic phenotype. This establishes a system that can be used to assess and understand prostate cancer processes.

This system has been utilized by our lab recently to assess the role of extracellular vesicles in prostate cancer. Cancer-derived EVs are particularly interesting as they have been implemented in modifying the tumour microenvironment and establishing a pre-metastatic niche by transferring cytoplasmic material from the host tumour cell to a distant recipient. Primarily this is due believed to be due to the protein content of the EVs. While the introduction of cavin-1 did modulate protein content, the more interesting finding was the change in microrna content.

Now microRNAs in EVs is also an interesting new process that has been linked to cancer. Here we found that mir-148a was secreted and possessed reduced secretion in cavn-1 positive cells lines. Mir-148a was found to induce osteoclastogensis so its secretion is believed to be a contributor to bone metastasis. This miR was differentially secreted but did not modify the cellular content which indicates that there is some sort of protein mediated export that allows for its export n pro0metastatic cells but not in healthy cells.