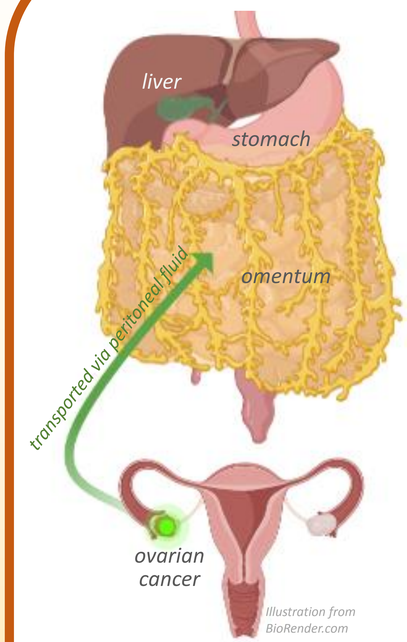
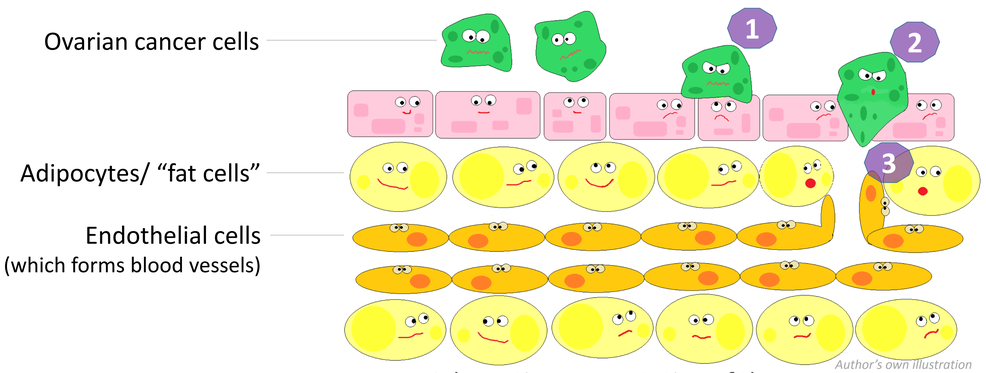
Fatty Blanket under Attack: Ovarian Cancer Metastasis to the Omentum



INTRODUCTION

- Ovarian cancer is the deadliest of gynaecologic cancers; survival after 5 years from diagnosis is less than 45%.
- This is linked to advanced disease spread/metastasis, where the cancer has spread beyond the ovaries, with the omentum as a preferred metastatic site.
- The omentum is a fatty organ which blankets the intestines, and is mostly composed of adipocytes/ "fat cells." When cancer cells reach the omentum:



Schematic representation of the omentum

1. Cancer cells adhere to outer layer of mesothelial cells
2. Cancer cells invade past mesothelial cell layer
3. Cancer cells activate endothelial cells to grow in order to supply nutrients to the cancer

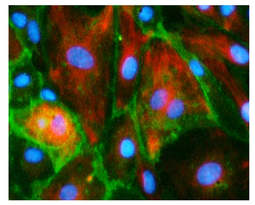
RESEARCH AIMS

Investigate the mechanism of:

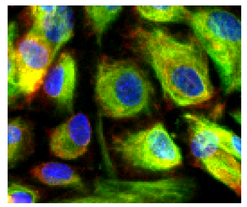
- ovarian cancer cell adhesion to mesothelial cells;
- endothelial cell activation in the presence of ovarian cancer cells.

FINDINGS

- Successfully developed methods to extract and grow endothelial cells and mesothelial cells in the lab.

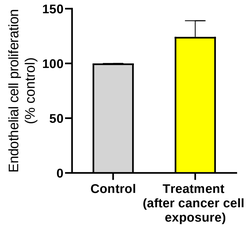


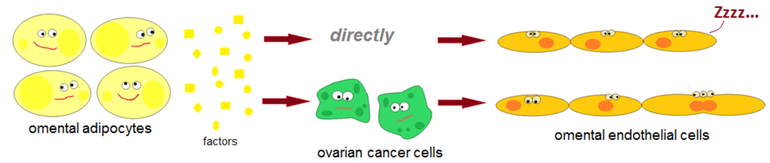
Omental endothelial cells stained for von Willebrand Factor (red) and CD31 (green)



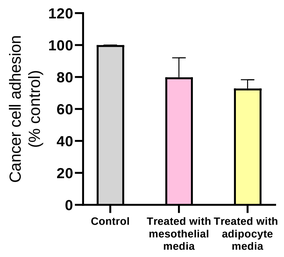
Omental mesothelial cells stained for cytokeratin (red) and vimentin (green)

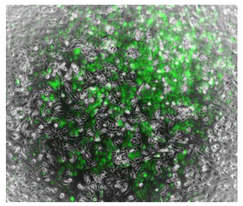
- Individual factors released from the adipocytes did not activate endothelial cells to grow, but required the cancer cells as an intermediary for endothelial cell activation.





- Factors released from adipocytes and mesothelial cells protect the mesothelial cell layer from being invaded by cancer cells.





Adhesion of ovarian cancer cells (green) onto mesothelial cell layer

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