Heterogeneity of morphological features in primary cultures of ovarian cancer developed from multiple tissue sites

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Introduction

• Ovarian cancer is the leading gynaecological cancer with overall 5 year survival of 30–39% (1).

•It has long been recognized by clinicians that ovarian cancer is a set of heterogeneous diseases but despite this ovarian carcinoma continues to be treated clinically as a single disease (2).

•We have established primary cultures from over 100 ascitic fluid and more than 60 from solid tissues.

•These finding in inter and intra tumour heterogeneity may help us to develop a novel approach for better treatment modalities. in the ovarian cancer.

Aim and Objectives

1. Whether primary culture can be successfully grown from multiple tumor/tissue sites (Omentum, Peritoneum, Ovary, Fimbriae, ascities) using the same protocol

2. To study morphological differences in the primary culture grown from different sites denoting the inter and intra tumor homogeneity.

Methodology

Enzymatic dissociation

- Collect the tumor from ovarian cancer patient
- Wash with PBS and transfer to 15 ml centrifuge tube in Dispase II solution (1.6U /ml, for 2-3 ml)
- Keep at 4^0C for 16hr followed by 1 hr room temperature
- Collect the Dispase II solution and wash with PBS
- Transfer the tissue in 0.025% trypsin- EDTA solution, dissected into, ~3mm pieces
- Keep 12 min at 37^OC with gentle shaking
- Neutralized the solution with equal volume DMEM (10% FCS)
- The cell suspension will be transferred to a 15ml tube, centrifuged at 400xG for 5 minutes,
- PBS wash, re-suspended in RPMI medium (20% FCS) and will be placed in a T25 flask.

Discussion

- We have observed difference in morphological characteristics both within and between the tumors.
- Morphological phenotyping may be correlated with clino-pathologial sub types.
- We have cryo-preserved all the developed cultures in biobank.

Results

Fig 1: Inter-tumour Heterogeneity

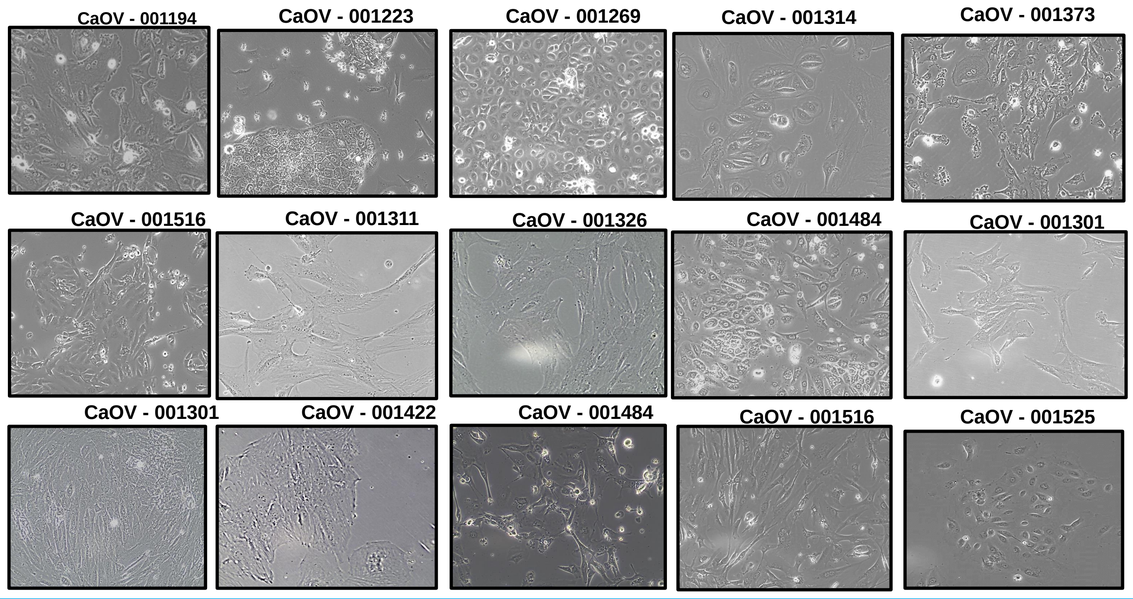
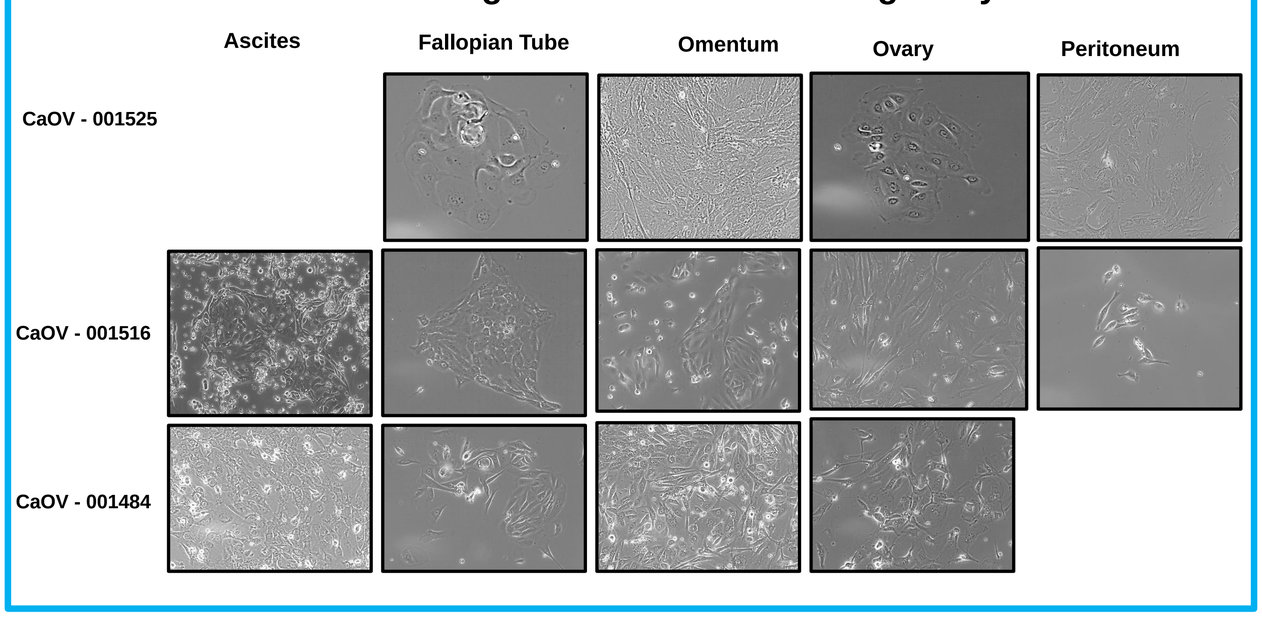


Fig 2: Intra-tumour Heterogeneity



BV	SURGERY TYPE	STAGE	HISTO	CA 125	BMI	AGE
CaOV - 001194	PDS	IIIC	High Grade Serous Carcinoma	1811	19.1	45
CaOV - 001269	IDS	IVB	Low Grade Serous	121	25.68	42
CaOV - 001314	NA	IIIC	NA	119	NA	41
CaOV - 001373	IDS	IVB	High Grade Serous Carcinoma	493	27.78	44
CaOV - 001376	IDS	IIIC	Serous Carcinoma	1364	25.74	44
CaOV - 001424	NA	IA	NA	129.4	NA	51
CaOV - 001516	PDS	IIIC	Low Grade Serous carcinoma	>1000	21.76	42
CaOV - 001484	PDS	IIIC	High Grade Serous Carcinoma	1883	31.46	61
CaOV - 001326	PDS	IIIC	High Grade Serous Carcinoma	17.3	27.98	56
CaOV - 001311	IDS	IVB	High Grade Serous Carcinoma	4377	35.9	53
CaOV - 001525	IDS	IIIC	High Grade Serous Carcinoma	326	27.59	54
CaOV - 001765	PDS	IIIC	High Grade Serous Carcinoma	804	26.79	48
CaOV - 001810	PDS	IIIC	High Grade Serous Carcinoma	6496	27.49	60
CaOV - 001301	IDS	IIIC	High Grade Serous Carcinoma	775	27.8	52
CaOV - 001422	PDS	IC	Endometroid carcinoma	47.63	24.93	49
CaOV - 001809	PDS	IIIC	High Grade Serous Carcinoma	424	26.37	62
CaOV - 001581	IDS	IIIC	High Grade Serous Carcinoma	498	29.68	50

Table 1: Demographic Data

Conclusion

- There is a distinct characteristic difference was found in different tumour types.
- Need a larger data set to validate our findings.

References

1. Mukhopadhyay A, Elattar A, Cerbinskaite A, et al., Clin Cancer Res. 2010,15;16(8):2344-51.
2. O Donnell RL, McCormick A, Mukhopadhyay A, et al., PLoS One. 2014, 6;9(6):e90604.

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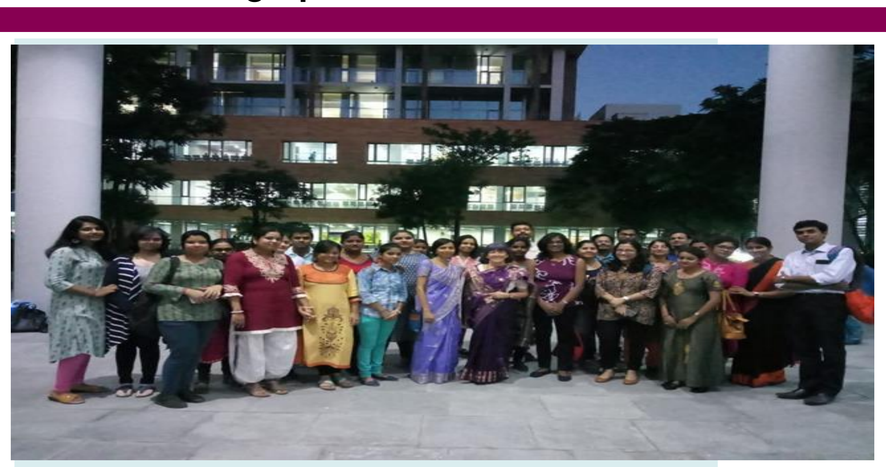

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