less than 200 at the time of death. Six of them had 3 separate malignancies.

Conclusions: Median age at time of diagnosis was significantly lower than that of the general population. HIV-infected women are at high risk for HPV-associated malignancies, even those who respond to antiretroviral therapy as measured by high CD4 levels and low viral loads. Multiple concurrent cancers are relatively common, even in patients with well-controlled HIV. Based on the data, survival was strongly correlated with response to antiretroviral therapy. However, multiple confounding factors may be present, emphasizing the need for further study. Careful cancer surveillance is critical and should be maintained, even in women who are responding to antiretroviral therapy. Similarly, oncologic encounters provide opportunities to reinforce the importance of adherence to antiretroviral therapy. Additionally, once a diagnosis of malignancy has been made, the level of vigilance in screening for other malignancies should increase.

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Poster #26

Focal Adhesion Kinase (FAK) Regulation of Programmed Death-1 (PD-1)/Programmed Death Ligand-1 (PD-L1) checkpoint signaling in a mouse model of epithelial ovarian cancer

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Objectives: Our objectives were to create an aggressive mouse ovarian cancer model with genetic similarity to human high grade serous ovarian cancer (HGSOC); and to use this model to explore the effect of focal adhesion kinase (FAK) on tumor cell proliferation, leukocyte infiltration, and expression of PD-1 and PD-L1.

Methods: We previously derived the aggressive "ID8-IP" mouse ovarian cancer cell line from ID8 cells by intraperitoneal passage into an immunocompetent C57BL/6 mouse. Exome sequencing was used to determine deletions and copy number alterations (CNAs), and RNA sequencing was used to determine relative gene expression between the ID8 and ID8-IP cell lines. A FAK knockout cell line was generated ("ID8-IP FAK KO") using the CRISPR/Cas9 system, and a third cell line ("ID8-IP FAK re-expressing") was created by re-introducing FAK into "ID8-IP FAK KO" cells using lentiviral transduction. Tumor cells were injected intraperitoneally into C57BL/6 mice (n=8 per group), and tumor cell and immune cell populations among ascites-associated cells were identified using flow cytometry.

Results: Our ID8-IP cell line demonstrated several deletions and CNAs analogous to common genomic alterations in human HGSOC (Table 1). In particular, there were several alternate splice variants in the tumor suppressor p53 gene (Trp53), and no p53 protein detected in the ID8-IP cell line by Western blot. Using our mouse model, we found a higher proportion of tumor cells in the ID8-IP compared to the ID8-IP FAK KO (61.4% vs 24.4%, respectively; $p<0.0001$), and fewer leukocytes (19.9% vs 48.3%, $p=0.0003$). There were more PD-1 positive CD8+ T cells in the ID8-IP relative to the ID8-IP FAK KO (38.18% vs 14.26%, respectively; $p=0.038$). Similar trends were noted between the ID8-IP FAK re-expressing and ID8-IP FAK KO groups. In vitro, ID8-IP cells had more cell surface PD-L1 expression compared to ID8-IP FAK KO cells (81.4% vs 39.7%, respectively; $p<0.0001$), with the highest PD-L1 expression in the ID8-IP FAK re-expressing cells (88.5%).

Conclusions: We established a unique mouse ovarian cancer model with genetic similarity to human high grade serous ovarian cancer that allows for study of the immune microenvironment. Here, we present a novel link between FAK and the PD-1/PD-L1 pathway in ovarian cancer. Ongoing studies will further explore the relationship between FAK and this immune checkpoint pathway, as well as other immune cell populations.

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Poster #27

Incidence and implications of circulating tumor cells in endometrial cancer

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Objectives: Endometrial cancer is the most common gynecologic malignancy affecting women in the United States. Historically, 20-25% of patients with clinical stage I disease will have extrauterine disease at the time of surgery. These patients account for a large proportion of endometrial cancer related recurrences and deaths. Recently, the utility of surgical staging has been called into question by a series of prospective trials that have failed to demonstrate a survival benefit for comprehensive surgical staging. Currently, no biomarker exists to predict which patients are at risk for extrauterine disease at the time of presentation. Increasing numbers of circulating tumor cells (CTCs) have been linked to the ability to predict metastases in malignancies like breast cancer. This study aims to evaluate the ability of CTCs to serve as a biomarker for identifying women at risk of metastatic disease and need for comprehensive surgical staging.

Methods: A prospective cohort study was performed. Informed consent was obtained and 10mL of whole blood was collected from women with clinical stage I endometrial carcinoma of any tumor grade and histology. The CTCs were collected from the sample using an ISET device, fixed in duplicate on a porous membrane, stained with MGG, and identified and counted by a gynecologic pathologist. Clinical, demographic, and outcome data was abstracted from patient's electronic medical records. Summary statistics were used to describe demographic and clinical characteristics. Fisher's Exact Tests were used to assess associations between CTCs and clinical variables.

Results: 37 patients with clinical stage I endometrial cancer were included in the study. The majority of patients (59.5%, n=22) had IA disease following definitive surgical management. Eleven patients (29.7%) were found to have extrauterine disease following surgery. CTCs were identified in 48.7% of patients. There was no association between FIGO stage and presence of CTCs ($p=0.5621$). There was no association between tumor grade and presence of CTCs ($p=0.6092$). Additionally, there was no association between tumor histology and presence of CTCs ($p=0.6943$).

Conclusions: CTCs do not appear to be a reliable indicator of extrauterine disease among women with clinical stage I endometrial cancer. Further study is needed to develop predictive markers for those women requiring comprehensive surgical staging in this population.

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Poster #28

Vitamin D, leptin, vitamin D receptor single nucleotide polymorphism and treatment-related morbidity in ovarian, primary peritoneal, and fallopian tube cancer

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