Adult-type granulosa cell tumor (aGCT) is a rare ovarian sex-cord stromal tumor (~5% of all ovarian tumors).

Most primary aGCTs are diagnosed at an early stage and can be removed surgically with long-term survival rates exceeding 90%.

aGCT recurrence is difficult to predict and is almost always incurable after relapse.

The objective:
Identify the differences between Primary and Recurrent aGCTs which may correlate with recurrence.
Differential Gene Expression analysis: Recurrent vs Primary tumors

- 31 differentially expressed gene identified ($P_{adj} < 0.05$, FoldChange > 2)

Functional Enrichment analysis: Gene Set Enrichment

- Higher Expression in Primary Tumors:
  - LHCG and INSL3 - genes involved in normal ovarian sex cord hormonal signaling

- Higher Expression in Recurrent Tumors:
  - NELL2, GDF6, and IL1RL1 - in some cancer types increases expression of these genes were associated with increased metastasis and decreased survival rate
  - CYP19A1 (aromatase) expression may be closely linked to aGCT pathogenesis and progression

Primarily immune-related and hormone-regulated gene sets expression was increased in recurrent tumors

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Comparative tumor microenvironment analysis

- Tumor microenvironment in silico cytometry

- Tumor microenvironment analysis

Conclusions:

- Tumor microenvironment composition is significantly different between primary and recurrent aGCTs
  - Recurrent tumors have increased myeloid fraction and reduced prevalence of stromal cells what can promote tumor progression

- Expression of genes involved in ovarian hormone signaling was identified as significantly altered in recurrences
  - Changes in hormonal signaling pathways may underpin aGCT recurrence

Financial support: This work was supported by grants from the Cancer Prevention and Research Institute of Texas (CPRIT) to R.T.H. (RR200045) and P.A.F. (R1205). R.T.H. is supported by the Jennifer “Jenny” Song Fund for Granulosa Cell Tumor Research. The University of Texas MD Anderson Cancer Center Multidisciplinary Gynecologic Cancer Tumor Bank is supported in part by NIH P50CA83639 SPORE in Ovarian Cancer. The authors declare no potential conflicts of interest.