

Supplementary Material

ATP-related proteins were associated with Hürthle cell carcinomas identified by bioinformatic analysis and immunohistochemistry

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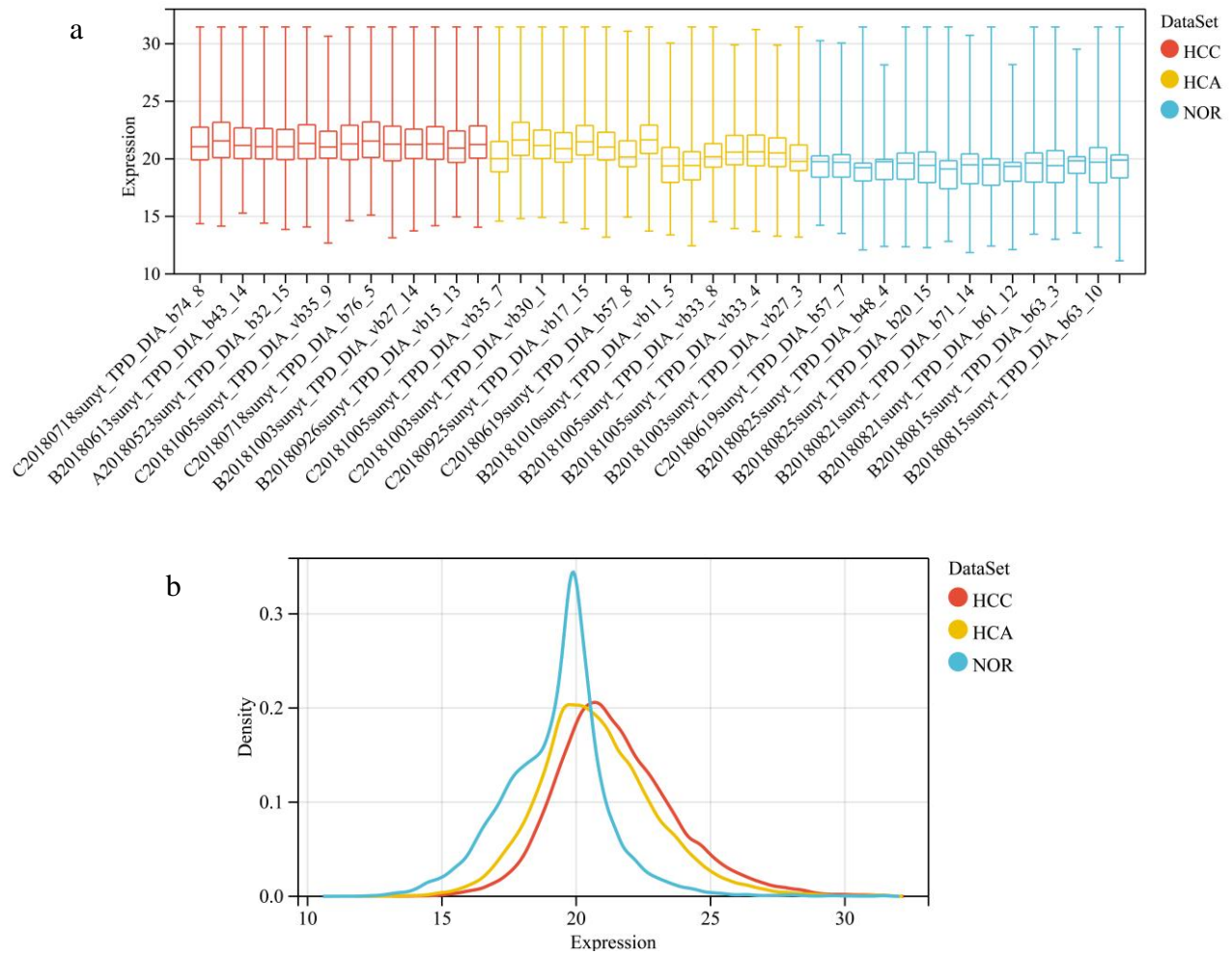
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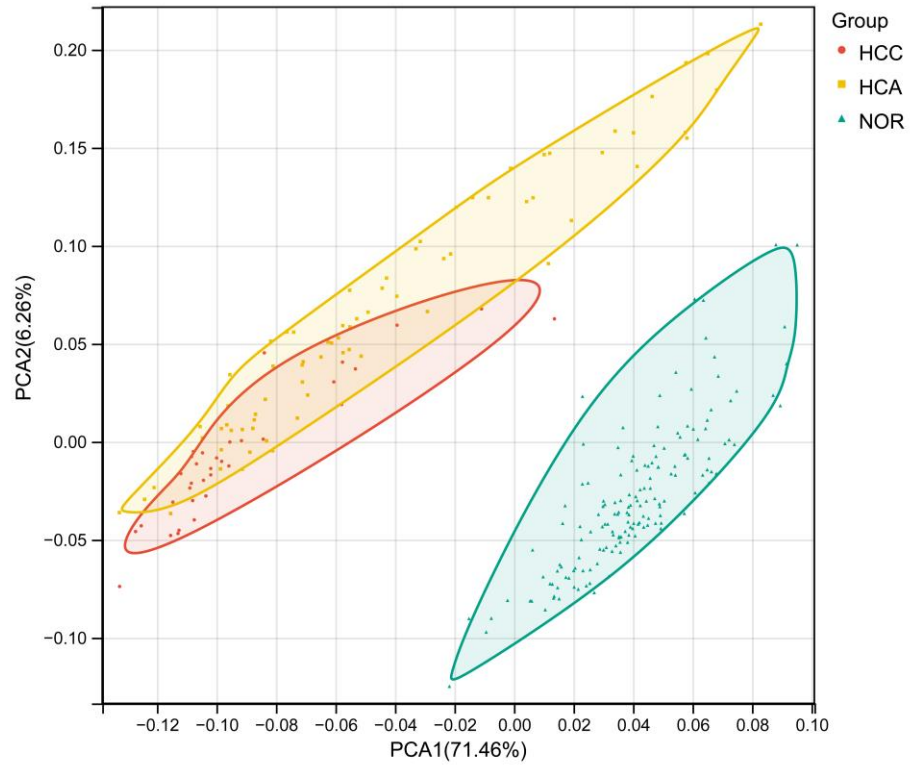
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1 Supplementary Figures



Supplement Figure 1. Protein expression in different groups. (a) Examples of protein expression levels of samples in different groups. (b) Total protein expression levels of samples in different groups.



Supplement Figure 2. PCA of three groups of samples. The red circle represented HCC, the blue square represented HCA, and the green triangle represented NOR.

2 Supplementary Tables

Supplementary Table 1. The protein expression profile group information

| ID | Type | Group |
|--------------------------------|----------------------|-------|
| C20181006sunyt_TPD_DIA_vb36_9 | Hurthle cell adenoma | HCA |
| C20181005sunyt_TPD_DIA_vb35_7 | Hurthle cell adenoma | HCA |
| C20181005sunyt_TPD_DIA_vb35_6 | Hurthle cell adenoma | HCA |
| C20181005sunyt_TPD_DIA_vb35_5 | Hurthle cell adenoma | HCA |
| C20181003sunyt_TPD_DIA_vb30_1 | Hurthle cell adenoma | HCA |
| C20181001sunyt_TPD_DIA_vb28_3 | Hurthle cell adenoma | HCA |
| C20180929sunyt_TPD_DIA_vb19_10 | Hurthle cell adenoma | HCA |
| C20180925sunyt_TPD_DIA_vb17_15 | Hurthle cell adenoma | HCA |
| C20180924sunyt_TPD_DIA_vb11_4 | Hurthle cell adenoma | HCA |
| C20180924sunyt_TPD_DIA_vb11_3 | Hurthle cell adenoma | HCA |
| C20180917sunyt_TPD_DIA_vb1_1 | Hurthle cell adenoma | HCA |
| C20180619sunyt_TPD_DIA_b57_8 | Hurthle cell adenoma | HCA |
| C20180618sunyt_TPD_DIA_b51_15 | Hurthle cell adenoma | HCA |
| B20181010sunyt_TPD_DIA_vb23_5 | Hurthle cell adenoma | HCA |
| B20181010sunyt_TPD_DIA_vb11_5 | Hurthle cell adenoma | HCA |
| B20181009sunyt_TPD_DIA_vb3_4 | Hurthle cell adenoma | HCA |
| B20181008sunyt_TPD_DIA_vb31_11 | Hurthle cell adenoma | HCA |
| B20181006sunyt_TPD_DIA_vb34_2 | Hurthle cell adenoma | HCA |
| B20181005sunyt_TPD_DIA_vb33_8 | Hurthle cell adenoma | HCA |
| B20181005sunyt_TPD_DIA_vb33_7 | Hurthle cell adenoma | HCA |
| B20181005sunyt_TPD_DIA_vb33_4 | Hurthle cell adenoma | HCA |
| B20181003sunyt_TPD_DIA_vb27_6 | Hurthle cell adenoma | HCA |
| B20181003sunyt_TPD_DIA_vb27_3 | Hurthle cell adenoma | HCA |
| B20181003sunyt_TPD_DIA_vb27_13 | Hurthle cell adenoma | HCA |
| B20181001sunyt_TPD_DIA_vb25_3 | Hurthle cell adenoma | HCA |
| B20180927sunyt_TPD_DIA_vb16_2 | Hurthle cell adenoma | HCA |
| B20180926sunyt_TPD_DIA_vb15_5 | Hurthle cell adenoma | HCA |
| B20180926sunyt_TPD_DIA_vb15_2 | Hurthle cell adenoma | HCA |
| B20180926sunyt_TPD_DIA_vb15_12 | Hurthle cell adenoma | HCA |
| B20180925sunyt_TPD_DIA_vb9_6 | Hurthle cell adenoma | HCA |
| B20180925sunyt_TPD_DIA_vb9_5 | Hurthle cell adenoma | HCA |
| B20180925sunyt_TPD_DIA_vb9_2 | Hurthle cell adenoma | HCA |
| B20180925sunyt_TPD_DIA_vb9_15 | Hurthle cell adenoma | HCA |
| B20180923sunyt_TPD_DIA_vb7_9 | Hurthle cell adenoma | HCA |
| B20180921sunyt_TPD_DIA_vb4_1 | Hurthle cell adenoma | HCA |
| B20180920sunyt_TPD_DIA_vb3_11 | Hurthle cell adenoma | HCA |
| B20180920sunyt_TPD_DIA_vb3_1 | Hurthle cell adenoma | HCA |
| B20180825sunyt_TPD_DIA_b50_4 | Hurthle cell adenoma | HCA |
| B20180821sunyt_TPD_DIA_b71_13 | Hurthle cell adenoma | HCA |
| B20180816sunyt_TPD_DIA_b65_6 | Hurthle cell adenoma | HCA |

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| B20180807sunyt_TPD_DIA_b11_1 | Hurthle cell adenoma | HCA |
| B20180721sunyt_TPD_DIA_b78_12 | Hurthle cell adenoma | HCA |
| B20180720sunyt_TPD_DIA_b77_14 | Hurthle cell adenoma | HCA |
| B20180619sunyt_TPD_DIA_b52_2 | Hurthle cell adenoma | HCA |
| B20180616sunyt_TPD_DIA_b45_12 | Hurthle cell adenoma | HCA |
| B20180615sunyt_TPD_DIA_b44_11 | Hurthle cell adenoma | HCA |
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| B20180607sunyt_TPD_DIA_b40_2 | Hurthle cell adenoma | HCA |
| B20180606sunyt_TPD_DIA_b41_6 | Hurthle cell adenoma | HCA |
| B20180606sunyt_TPD_DIA_b41_2 | Hurthle cell adenoma | HCA |
| B20180501sunyt_TPD_DIA_b6_15 | Hurthle cell adenoma | HCA |
| A20181003sunyt_TPD_DIA_vb24_8 | Hurthle cell adenoma | HCA |
| A20181002sunyt_TPD_DIA_vb23_6 | Hurthle cell adenoma | HCA |
| A20181002sunyt_TPD_DIA_vb23_4 | Hurthle cell adenoma | HCA |
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| A20180930sunyt_TPD_DIA_vb21_6 | Hurthle cell adenoma | HCA |
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| A20180510sunyt_TPD_DIA_b17_9 | Hurthle cell adenoma | HCA |
| A20180502sunyt_TPD_DIA_b8_4 | Hurthle cell adenoma | HCA |
| A20180501sunyt_TPD_DIA_b5_7 | Hurthle cell adenoma | HCA |
| A20180430sunyt_TPD_DIA_b4_9 | Hurthle cell adenoma | HCA |
| C20180718sunyt_TPD_DIA_b74_8 | Widely invasive hurthle cell carcinoma | HCC |
| B20180808sunyt_TPD_DIA_b10_11 | Widely invasive hurthle cell carcinoma | HCC |
| B20180725sunyt_TPD_DIA_b81_13 | Widely invasive hurthle cell carcinoma | HCC |
| B20180613sunyt_TPD_DIA_b43_14 | Widely invasive hurthle cell carcinoma | HCC |
| B20180609sunyt_TPD_DIA_b19_10 | Widely invasive hurthle cell carcinoma | HCC |
| B20180524sunyt_TPD_DIA_b30_14 | Widely invasive hurthle cell carcinoma | HCC |
| A20180906sunyt_TPD_DIA_b34_9 | Widely invasive hurthle cell carcinoma | HCC |
| A20180523sunyt_TPD_DIA_b32_15 | Widely invasive hurthle cell carcinoma | HCC |
| A20180520sunyt_TPD_DIA_b29_14 | Widely invasive hurthle cell carcinoma | HCC |
| C20181005sunyt_TPD_DIA_vb35_9 | Minimally invasive hurthle cell carcinoma | HCC |
| C20180924sunyt_TPD_DIA_vb11_7 | Minimally invasive hurthle cell carcinoma | HCC |
| C20180918sunyt_TPD_DIA_vb2_7 | Minimally invasive hurthle cell carcinoma | HCC |
| C20180917sunyt_TPD_DIA_vb1_13 | Minimally invasive hurthle cell carcinoma | HCC |
| C20180718sunyt_TPD_DIA_b76_5 | Minimally invasive hurthle cell carcinoma | HCC |

Supplementary Material

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|--------------------------------|---|-----|
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| B20181003sunyt_TPD_DIA_vb27_14 | Minimally invasive hurthle cell carcinoma | HCC |
| B20181002sunyt_TPD_DIA_vb26_9 | Minimally invasive hurthle cell carcinoma | HCC |
| B20181001sunyt_TPD_DIA_vb25_15 | Minimally invasive hurthle cell carcinoma | HCC |
| B20180930sunyt_TPD_DIA_vb20_4 | Minimally invasive hurthle cell carcinoma | HCC |
| B20180926sunyt_TPD_DIA_vb15_13 | Minimally invasive hurthle cell carcinoma | HCC |
| B20180924sunyt_TPD_DIA_vb8_3 | Minimally invasive hurthle cell carcinoma | HCC |
| B20180920sunyt_TPD_DIA_vb3_12 | Minimally invasive hurthle cell carcinoma | HCC |
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| A20190529sunyt_TPDDL_DIA_b5_66 | Normal Thyroid | NOR |
| A20190529sunyt_TPDDL_DIA_b5_65 | Normal Thyroid | NOR |
| A20190529sunyt_TPDDL_DIA_b5_59 | Normal Thyroid | NOR |

Supplementary Table 2. Ten hub genes through the MCC

| Gene | Rank | Score |
|--------|------|-------|
| ATP5A1 | 1 | 11672 |
| ATP5B | 2 | 8672 |
| UQCRC1 | 3 | 8455 |
| ATP5D | 4 | 7446 |
| ATP5C1 | 5 | 7346 |
| COX5A | 6 | 6960 |
| ATP5H | 7 | 6240 |
| ATP5O | 8 | 5760 |
| SUCLG1 | 9 | 5673 |
| ACO2 | 10 | 5586 |

Supplementary Table 3. Clinical and pathological characteristics of subjects for immunohistochemical analysis

| Type | Age | Gender | Tumor size (cm) | TNM stage | AJCC stage | Capsule invasion | Microscopic tumoral embolism |
|------|-----|--------|-----------------|-----------|------------|------------------|------------------------------|
| HCC | 51 | Female | 2.1 | T2N0M0 | I | Yes | Yes |
| HCC | 23 | Male | 2.3 | T2N0M0 | I | Yes | Yes |
| HCC | 63 | Female | 0.5 | T1N0M0 | I | Yes | No |
| HCC | 44 | Male | 3.7 | T2N0M0 | I | Yes | No |
| HCA | 51 | Female | 0.6 | - | - | - | - |
| HCA | 24 | Male | 5.0 | - | - | - | - |
| HCA | 45 | Female | 1.7 | - | - | - | - |
| HCA | 63 | Female | 1.2 | - | - | - | - |

Supplementary Table 4. Information on antibodies used in immunohistochemistry

| Antigen | Product number | Reactivity species | Manufacturer | Dilution ratio |
|---------|----------------|--------------------|------------------------|----------------|
| ATP5PD | 125725 | human | ZENBIO, Chengdu, China | 1:400 |
| ATP5F1B | R23569 | human | ZENBIO, Chengdu, China | 1:400 |
| ATP5F1C | 824213 | human | ZENBIO, Chengdu, China | 1:400 |



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