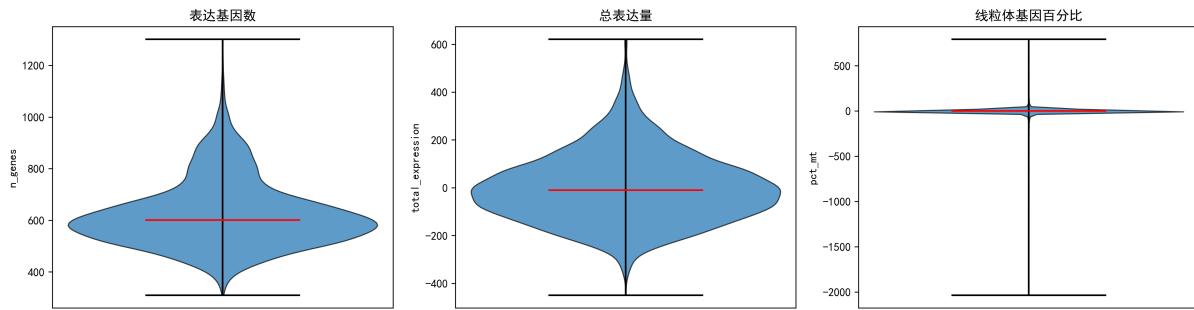


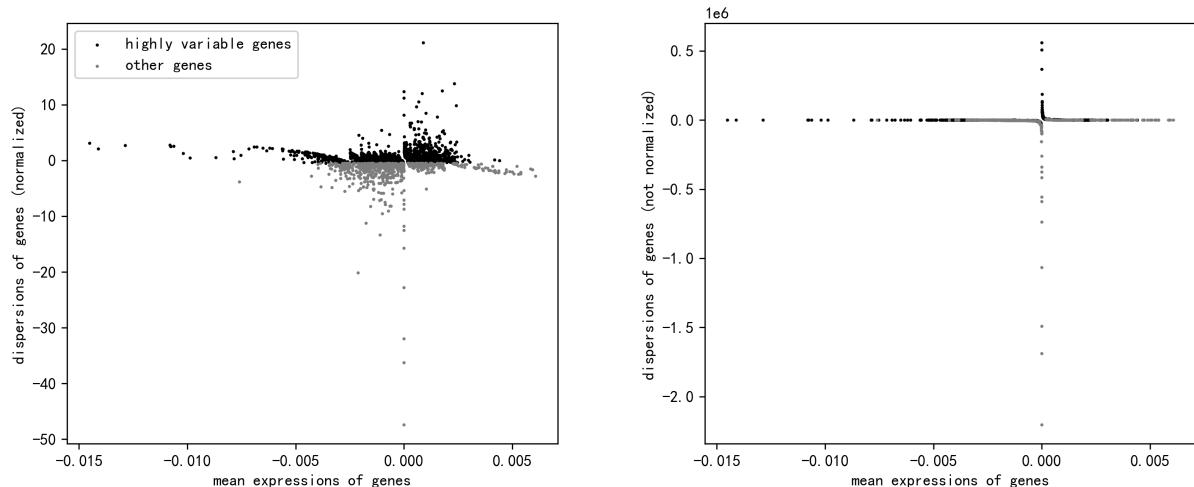
result

1. young2_RNA.py 输出结果

qc_metrics_violin.png

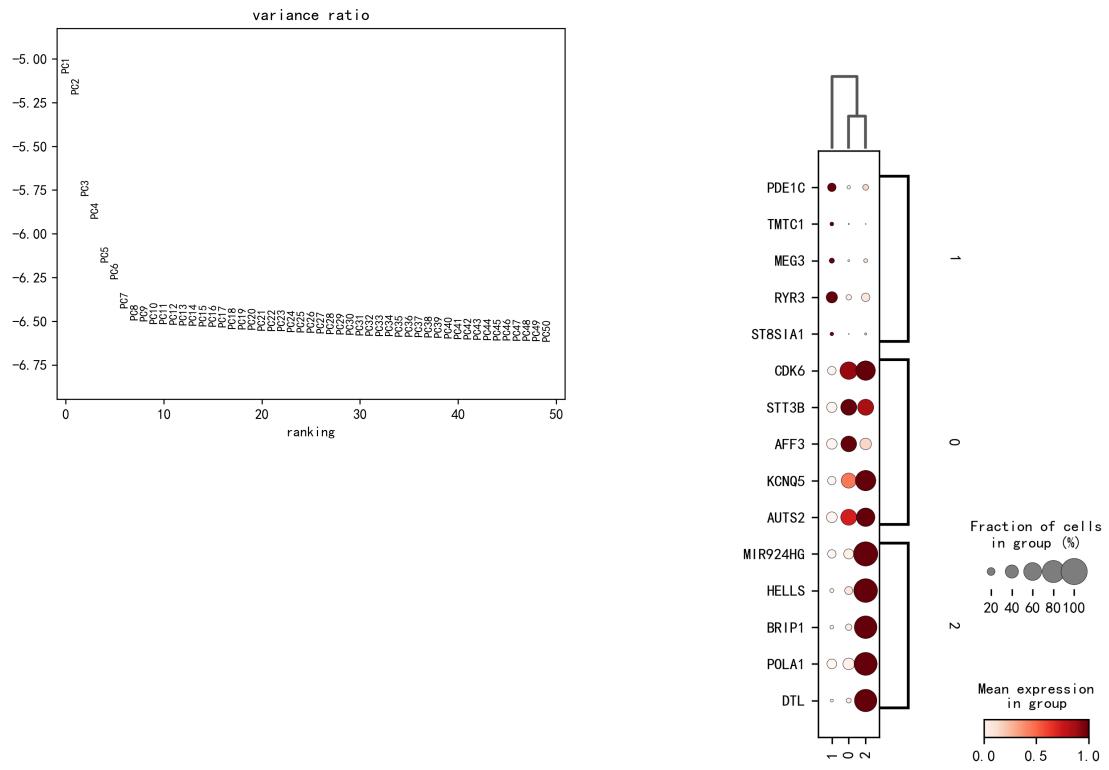


highly_variable_genes.png

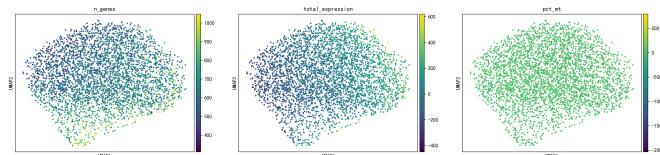


pca_variance_ratio.png

marker_genes_dotplot.png



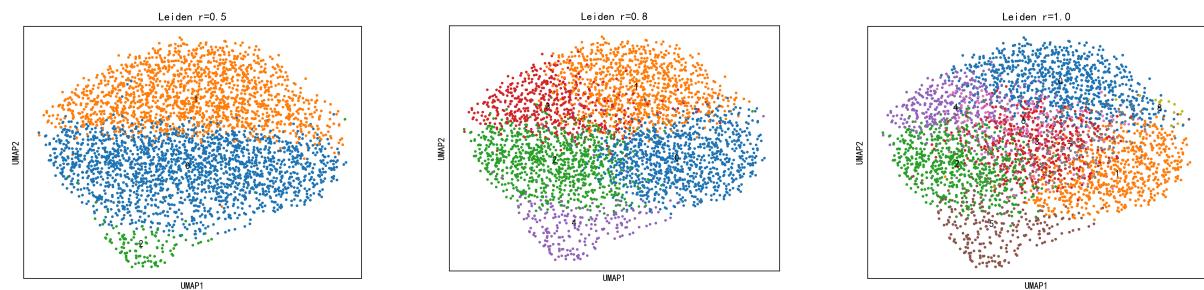
umap_qc_metrics.png



umap_leiden_r0.5.png

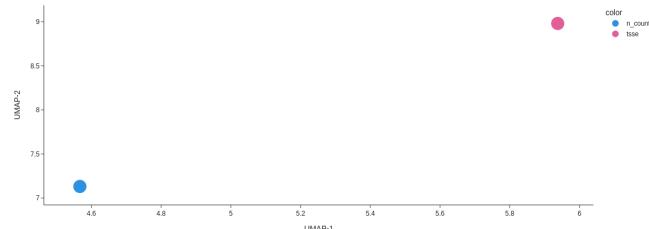
umap_leiden_r0.8.png

umap_leiden_r1.0.png

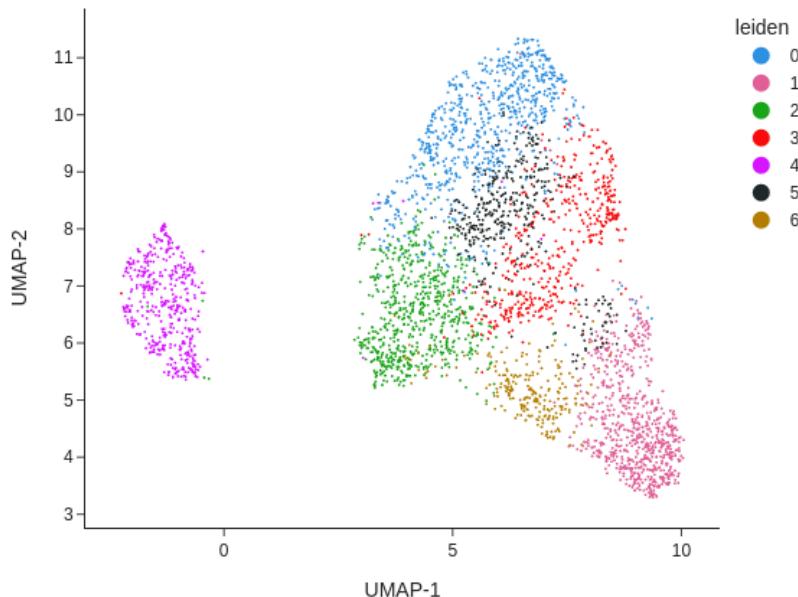


2. young2_ATAC.py 输出结果

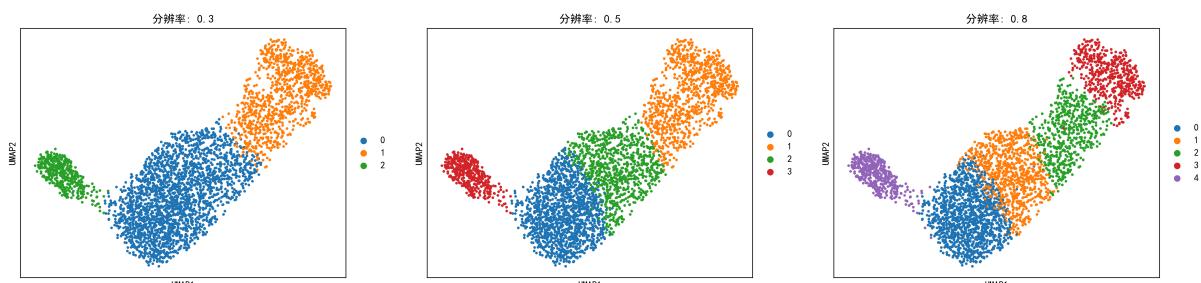
umap_initial.png



umap_leiden.png



3. young2_RNA-ATAC.py 输出结果



[16:15:22] 开始RNA-seq与ATAC-seq联合分析...

[16:15:22] 加载单组学数据...

[16:15:22] RNA数据加载完成: (3683, 3000)

```
[16:15:22] ATAC数据加载完成: (3703, 214525)
[16:15:23] 开始数据对齐...
[16:15:26] 匹配后共保留 3683 个细胞
[16:15:26] 创建多组学对象...
[16:15:26] 开始ATAC数据基因注释...
[16:15:39] 基因活性矩阵计算完成，已作为新模态添加到多组学对象
[16:15:39] 开始联合降维与聚类分析...
[16:15:52] 找到 2716 个共同基因用于联合分析
[16:15:53] PCA降维完成，前50个主成分方差解释率: 0.1160
[16:16:02] 联合聚类完成，尝试了3种不同分辨率，聚类图已保存至 /data/project/r2py/young2-result/figures/joint_clustering.png
[16:16:02] 开始关联分析...
[16:16:03] 相关性分析完成，已保存10个基因的结果
[16:16:03] 可视化 PDZRN4 时出错: [Errno 2] No such file or directory: 'figures/umap/data/project/r2py/young2-result/figures/PDZRN4_expression_activity.pdf'
[16:16:03] 可视化 PCDH9 时出错: [Errno 2] No such file or directory: 'figures/umap/data/project/r2py/young2-result/figures/PCDH9_expression_activity.pdf'
[16:16:03] 可视化 NKAIN2 时出错: [Errno 2] No such file or directory: 'figures/umap/data/project/r2py/young2-result/figures/NKAIN2_expression_activity.pdf'
[16:16:03] 保存分析结果...
[16:16:11] 结果保存失败: var_names seem to have been renamed and filtered at the same time. There is no way to restore the order. MuData object has to be re-created from these modalities:
mdata1 = MuData(mdata.mod)
[16:45:01] 开始RNA-seq与ATAC-seq联合分析...
[16:45:01] 加载单组学数据...
[16:45:01] RNA数据加载完成: (3683, 3000)
[16:45:01] ATAC数据加载完成: (3703, 214525)
[16:45:01] 开始数据对齐...
[16:45:03] 匹配后共保留 3683 个细胞
[16:45:03] 创建多组学对象...
[16:45:03] 开始ATAC数据基因注释...
[16:45:15] 基因活性矩阵计算完成，已作为新模态添加到多组学对象
[16:45:15] 开始联合降维与聚类分析...
[16:45:16] 找到 2716 个共同基因用于联合分析
```

[16:45:17] PCA降维完成，前50个主成分方差解释率: 0.1160
[16:45:26] 联合聚类完成，尝试了3种不同分辨率，聚类图已保存至 /data/project/r2py/young2-result/figures/joint_clustering.png
[16:45:26] 开始关联分析...
[16:45:27] 相关性分析完成，已保存10个基因的结果
[16:45:27] 可视化 PDZRN4 时出错: [Errno 2] No such file or directory: 'figures/umap/data/project/r2py/young2-result/figures/PDZRN4_expression_activity.pdf'
[16:45:27] 可视化 PCDH9 时出错: [Errno 2] No such file or directory: 'figures/umap/data/project/r2py/young2-result/figures/PCDH9_expression_activity.pdf'
[16:45:27] 可视化 NKAIN2 时出错: [Errno 2] No such file or directory: 'figures/umap/data/project/r2py/young2-result/figures/NKAIN2_expression_activity.pdf'
[16:45:27] 保存分析结果...
[16:45:35] 多组学分析结果已保存至: /data/project/r2py/young2-result/rna_atac_combined.h5mu
[16:45:41] 单组学结果已保存
[16:45:41] RNA-seq与ATAC-seq联合分析全部完成!