```
[1]
[1] "/home/ubuntu/"
[2] "/home/ubuntu/miniconda3/envs/cellranger-mkfastq/bin:/home/ubuntu/miniconda3/condabin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin:/home/ubuntu/.local/bin:/home/ubuntu/bin"
[3] "/home/ubuntu"
[4] "/home/ubuntu"
[5] "/home/ubuntu"
[6] "/home/ubuntu"
[7] "/home/ubuntu"
[8] "/home/ubuntu"
[9] "/home/ubuntu"
[10] "/home/ubuntu"
[11] "/home/ubuntu"
[12] "/home/ubuntu"
[13] "/home/ubuntu"
[14] "/home/ubuntu"
[15] "/home/ubuntu"
[16] "/home/ubuntu"
[17] "/home/ubuntu"
[18] "/home/ubuntu"
[19] "/home/ubuntu"
[20] "/home/ubuntu"
[21] "/home/ubuntu"
[22] "/home/ubuntu"
```

```
In [12]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```

```
In [13]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```

```
In [14]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [15]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [16]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
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In [19]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [20]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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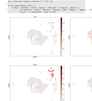
In [23]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```

```
In [24]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [25]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```

```
In [26]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```

```
In [27]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [28]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [29]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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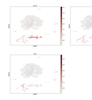

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In [30]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [31]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [32]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [33]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [34]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [35]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [36]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [37]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [41]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [43]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [44]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [45]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [46]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [47]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [48]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [49]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [50]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [51]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [52]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [53]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [54]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [55]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [57]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [58]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [59]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [60]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [61]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [62]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [63]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [64]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [65]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [66]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [67]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [68]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [69]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [70]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [71]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [72]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [76]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [77]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [79]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [80]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [81]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [82]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [83]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [84]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [85]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [86]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [87]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [88]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [89]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



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In [90]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [91]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [92]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [93]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [94]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [95]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [96]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [97]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [98]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [99]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [100]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [101]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [102]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [103]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [104]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [105]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [106]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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In [107]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [108]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [109]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [110]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [111]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [112]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [113]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [114]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [115]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [116]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [117]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [118]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [119]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
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```
In [121]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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```
In [122]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [123]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
```



```
In [124]: plot_umap_genes(adata,['Ccl5','Cd3e','Cd3d','Cd8a','Cd8b1'],'Cytotoxic T cells')
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