





Garrett uses a simple grammar for specifying cell types

>B cells

expressed: *CD19*, *MS4A1*, *CD79A*

>T cells

expressed: *CD3D*, *CD3E*, *CD3G*

not expressed: *CD19*

>CD4 T cells

expressed: *CD4*, *FOXP3*, *IL2RA*, *IL7R*

subtype of: T cells

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# The Garnett marker file defines a hierarchy of cell types

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## Define cell markers

```
>CD34+  
expressed: CD34, THY1, ENG, KIT, PROM1  
  
>NK cells  
expressed: NCAM1, FCGR3A  
  
>Monocytes  
expressed: CD14, FCGR1A, CD68, S100A12  
  
>B cells  
expressed: CD19, MS4A1, CD79A  
  
>T cells  
expressed: CD3D, CD3E, CD3G  
  
>CD4 T cells  
expressed: CD4, FOXP3, IL2RA, IL7R  
subtype of: T cells  
  
>CD8 T cells  
expressed: CD8A, CD8B  
subtype of: T cells  
  
>Dendritic cells  
expressed: IL3RA, CD1C, BATF3, THBD,  
CD209
```

## Generate cell type hierarchy

