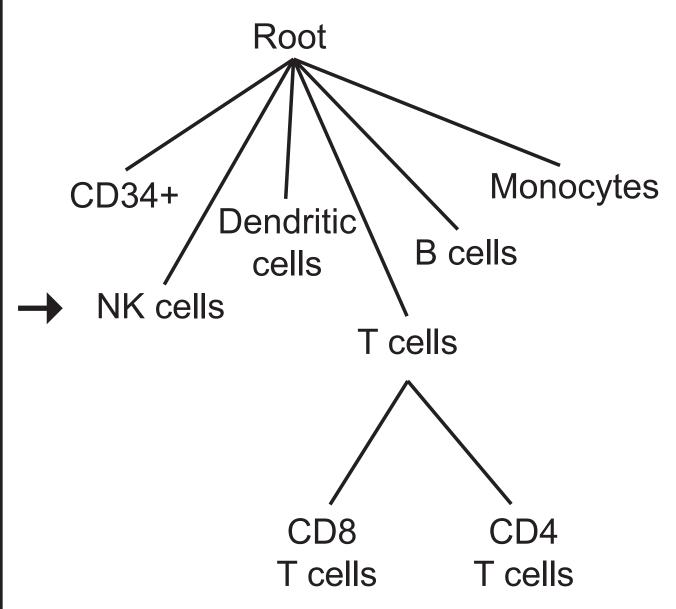
### The Garnett marker file defines a hierarchy of cell types

#### Define cell markers

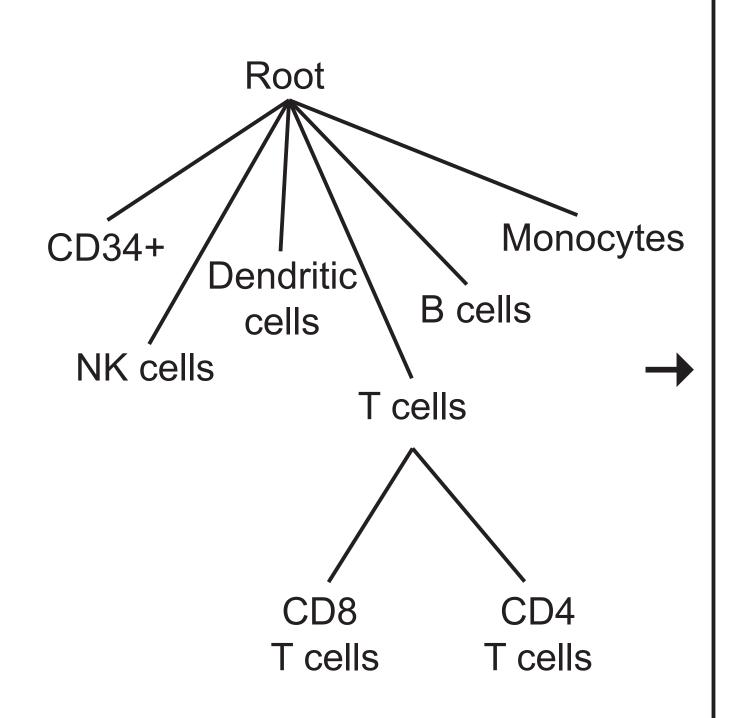
```
>CD34+
expressed: CD34, THY1, ENG, KIT, PROM1
>NK cells
expressed: NCAM1, FCGR3A
>Monocytes
expressed: CD14, FCGR1A, CD68, S100A12
>B cells
expressed: CD19, MS4A1, CD79A
>T cells
expressed: CD3D, CD3E, CD3G
>CD4 T cells
expressed: CD4, FOXP3, IL2RA, IL7R
subtype of: T cells
>CD8 T cells
expressed: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

## Generate cell type hierarchy

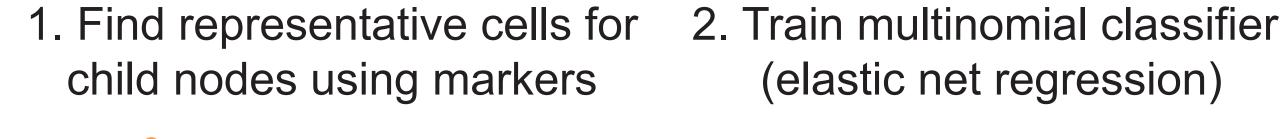


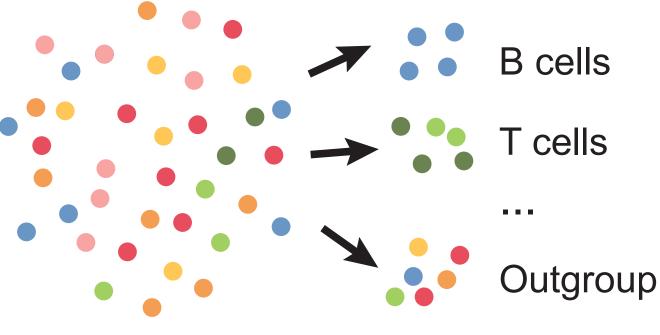
### Garnett uses trains a multi-level classifier to (sub)type cells

#### Generate cell type hierarchy

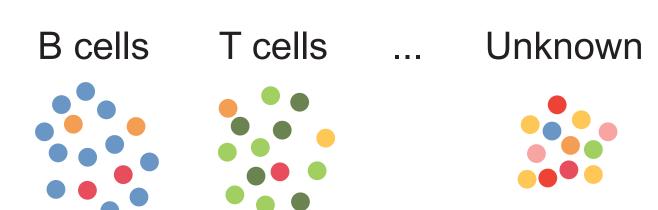


#### Train at each node:

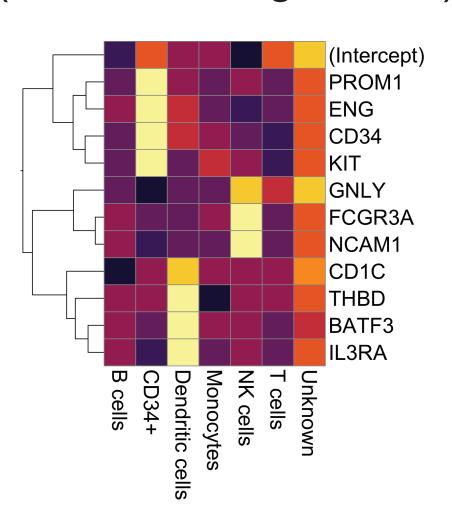




3. Classify cells at permissive threshold



# (elastic net regression)



4. Repeat for nodes with further children