Integration

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2023-07-27

Integration pipeline

```
libs <- c("Seurat", "tidyverse")
suppressMessages(
  suppressWarnings(sapply(libs, require, character.only = TRUE))
)
```

```
##    Seurat tidyverse
##      TRUE      TRUE
```

Integration of the sixteen Seurat objects consisting of the immune cells from each of the original dataset.

Upload input seurat objects

Integration with SCTransform

```
# note: Lau and Zhou datasets have coincident subject IDs, and were reannotated.

list <- list(MG_Mathys, MG_Grubman, MG_Lau, MG_Morabito,
             MG_Leng, MG_Zhou, MG_Pappalardo, MG_Thrupp,
             MG_Jakel, MG_Schirmer, MG_Velmeshev,
             MG_Feleke, MG_Tran, MG_Franjic, MG_Yang, MG_Fullard)

list <- lapply(X = list, FUN = SCTransform)

features <- SelectIntegrationFeatures(object.list = list, nfeatures = 3000)

list <- PrepSCTIntegration(object.list = list, anchor.features = features)

anchors <- FindIntegrationAnchors(object.list = list, normalization.method = "SCT",
                                  anchor.features = features, dims=1:20)

Seurat <- IntegrateData(anchorset = anchors,
                            normalization.method = "SCT",
                            dims=1:20,
                            features.to.integrate =anchors@anchor.features)
```

Dimensionality reduction and clustering

```
# Perform linear dimensiona reduction
Seurat <- RunPCA(Seurat, verbose = FALSE)
```

```r
#Dimensionality reduction and clustering
DefaultAssay(Seurat) <- "integrated"
Seurat <- RunUMAP(Seurat,  reduction = "pca",dims = 1:50, verbose = FALSE)
Seurat <- FindNeighbors(Seurat,  reduction = "pca",dims = 1:50)
Seurat <- FindClusters(Seurat,resolution =0.25)
```

```
## Modularity Optimizer version 1.3.0 by Ludo Waltman and Nees Jan van Eck
##
## Number of nodes: 64438
## Number of edges: 4031078
##
## Running Louvain algorithm...
## Maximum modularity in 10 random starts: 0.9240
## Number of communities: 18
## Elapsed time: 28 seconds
```

```r
#Visualization
color2 <-c("#E6AB02", "#FC8D62", "#7570B3" ,"#38470B", "#E5D8BD" ,"#874C62" ,
           "#937666", "#666666" ,"#FA7070" ,"#B3E2CD", "#344D67","#B3CDE3",
           "#D9D9D9" ,"#BC80BD", "#DE6E4B" ,"#430D27")

DimPlot(Seurat,reduction = "umap",
        cols = color2,
        repel = TRUE, pt.size = 0.01, label = F)
```