StructureEigenUk2

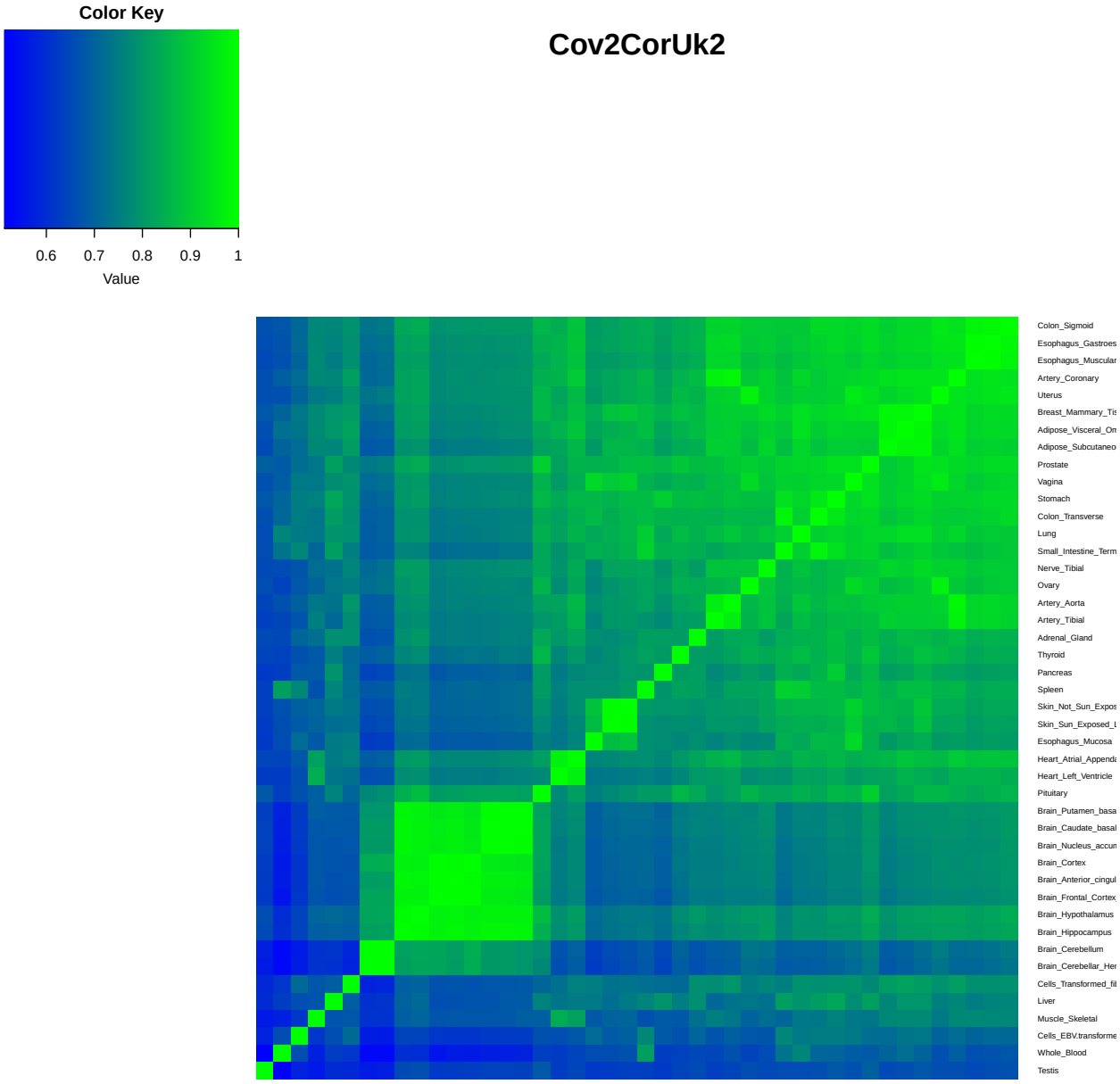
Here we plot the correlation matrix and the first 3 eigenvectors of Uk2.

```
library('knitr')

knitr::opts_chunk$set(cache=TRUE)
opts_chunk$set(fig.path = "/Users/sarahurbut/Dropbox/PaperEdits/Paper/Figures/")
covmat=readRDS("../Data/covmatAug13withED.rds")

z.stat=read.table("../Data/maxz.txt")
names=colnames(z.stat)
pis=readRDS("../../Dropbox/withzero/piswithzero.rds")$pihat[-1189]
pi.mat=matrix(pis,ncol=54,nrow=22,byrow = T)
```

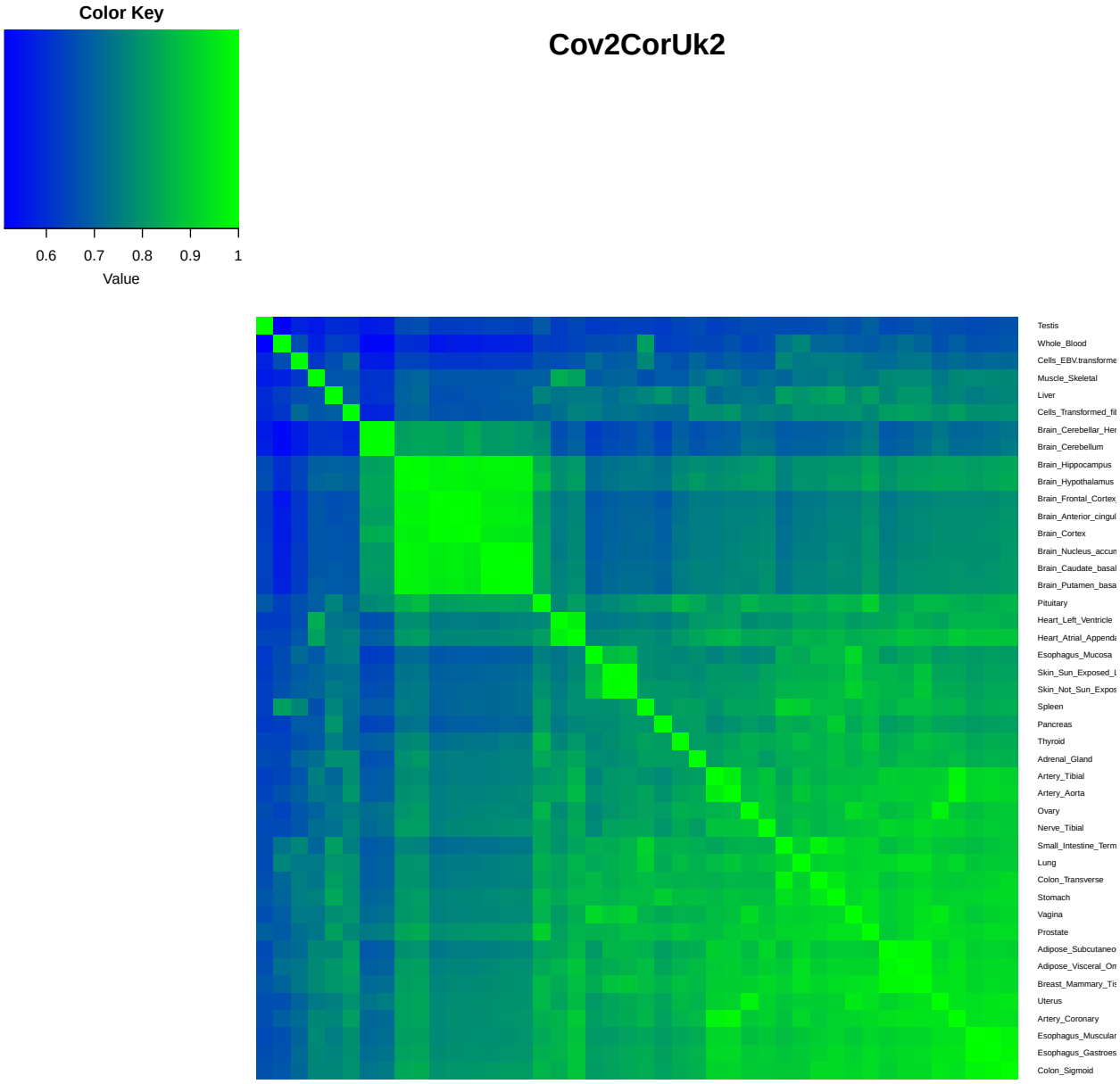
```
library(gplots)
library(ggplot2)
library('colorRamps')
#install.packages("fields")
library(fields)
k=2
colSums(pi.mat)[k]
```

```
## [1] 0.1617467
```

```
hclust.2=function (d, method = "average", members = NULL) {hclust(d, method, members)}
  x=cov2cor(covmat[[k]])
x[x<0]=0
  colnames(x)=names
  rownames(x)=names


##generate indices
h=heatmap.2(x,#symm=TRUE,
           #Rowv=FALSE,Colv=FALSE,
           dendrogram="none",density="none",trace="none",#col=redblue,
           col=blue2green(256),
           main=paste0("Cov2CorUk",k),
           cexRow=0.5,cexCol=0.5,cex.main=0.5,labCol="")
```



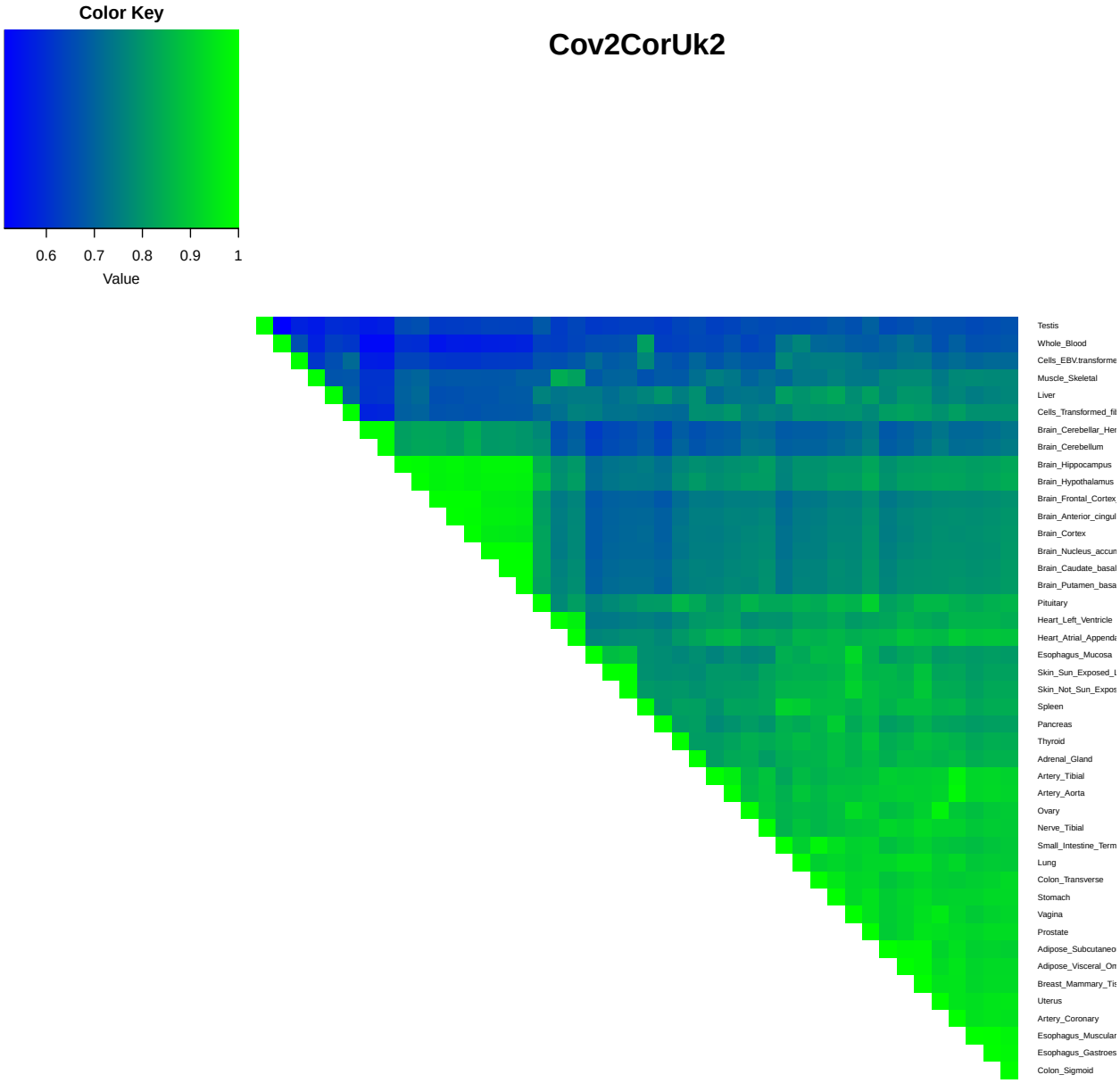

```
###transpose map

heatmap.2(x[h$rowInd,h$rowInd],#symm=TRUE,
          Rowv=FALSE,Colv=FALSE,
          dendrogram="none",density="none",trace="none",#col=redblue,
          col=blue2green(256),
          main=paste0("Cov2CorUk",k),
          cexRow=0.5,cexCol=0.5,cex.main=0.5,labCol="")
```




```
write.table(h$rowInd,file = paste0("uk",k,"rowIndices.txt"))
h=read.table(paste0("uk",k,"rowIndices.txt"))[,1]
```

heatmap:

```
smat=(x[h,h])
smat[lower.tri(smat)] <- NA


heatmap.2(smat,#symm=TRUE,
          Rowv=FALSE,Colv=FALSE,
          dendrogram="none",density="none",trace="none",#col=redblue,
          col=blue2green(256),
          main=paste0("Cov2CorUk",k),
          cexRow=0.5,cexCol=0.5,cex.main=0.5,labCol="")
```



As square:

```
#smat=(x[h,h])


# heatmap.2(smat,#symm=TRUE,
#           Rowv=FALSE,Colv=FALSE,
#           dendrogram="none",density="none",trace="none",#col=redblue,
#           col=blue2green(256),
#           main=paste0("Cov2Coruk2"),
#           cexRow=0.5,cexCol=0.5,cex.main=0.5,labCol="")
```

```
missing.tissues=c(7,8,19,20,24,25,31,34,37)
color.gtex=read.table("../Data/GTExColors.txt",sep = '\t', comment.char = '')[-missing.tissues,]
col = as.character(color.gtex[,2])
```

```
library('corrplot')
```

```
corrplot((x[h,h]),type="upper",cl.lim=c(0,1),tl.col=col[h],tl.cex=0.8,method="color",col=rep(blue2green
```

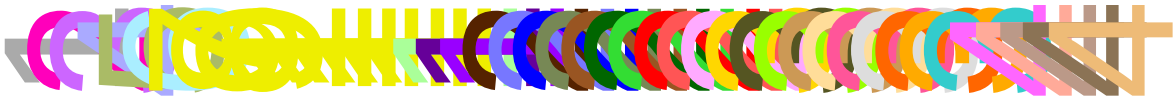
```
## Warning in ind1:ind2: numerical expression has 2 elements: only the first
## used
```

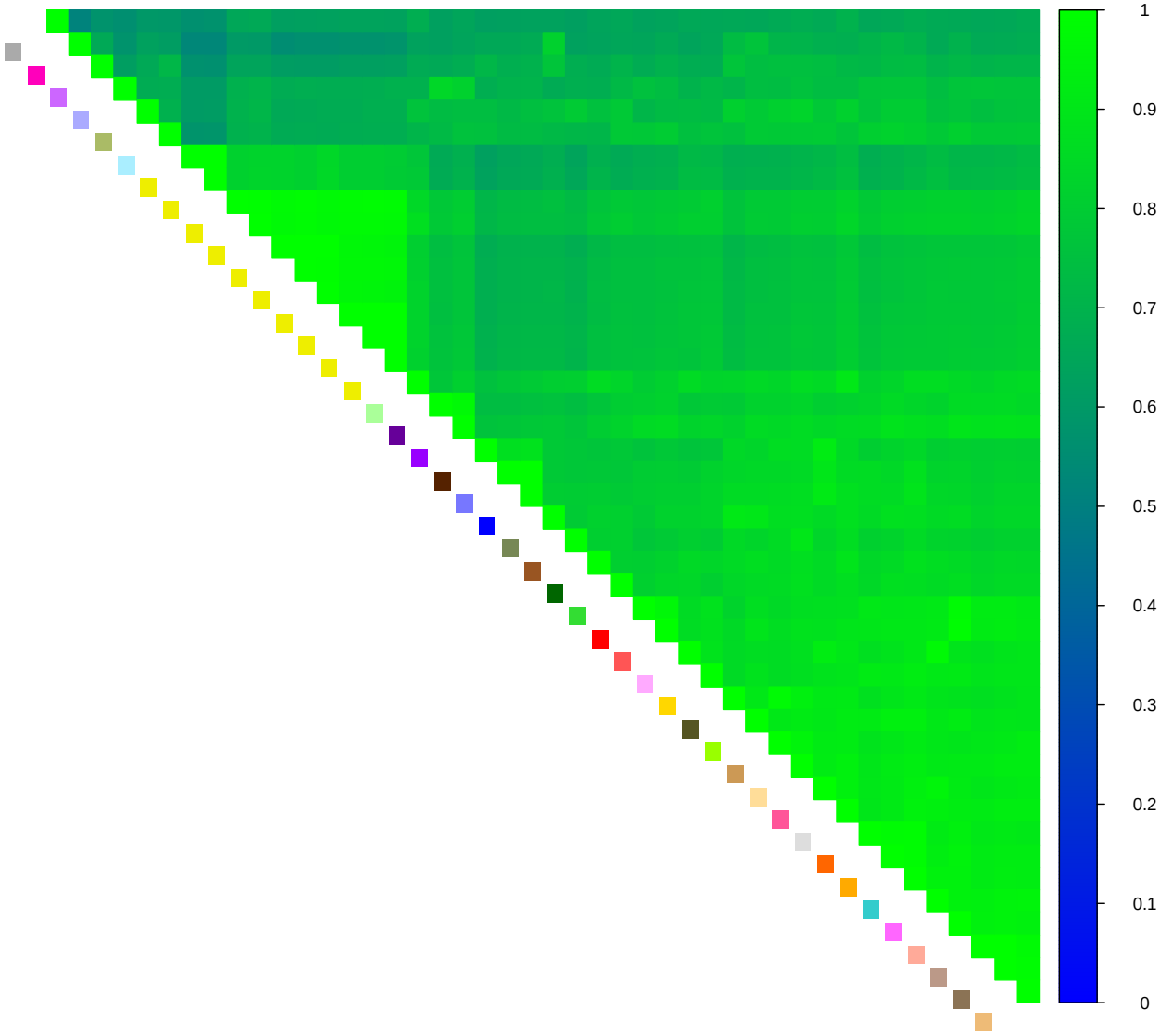
```
## Warning in ind1:ind2: numerical expression has 2 elements: only the first
## used
```


```
colnames(x)=NULL
rownames(x)=rep(".",44)
corrplot((x[h,h]),type="upper",cl.lim=c(0,1),tl.col=col[h],tl.cex=8,method="color",col=rep(blue2green(25
```

```
## Warning in ind1:ind2: numerical expression has 2 elements: only the first
```

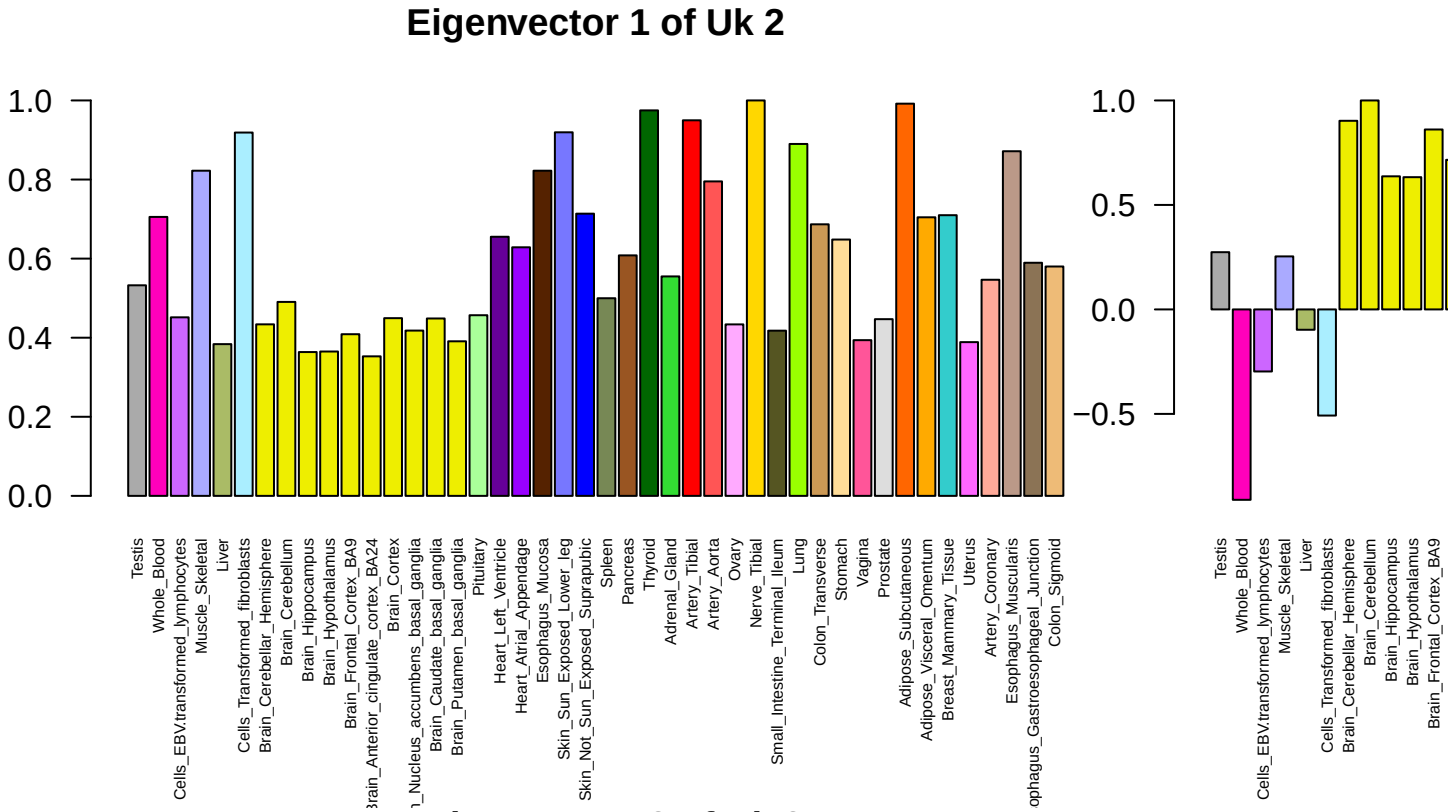
```
## used

## Warning in ind1:ind2: numerical expression has 2 elements: only the first
## used
```

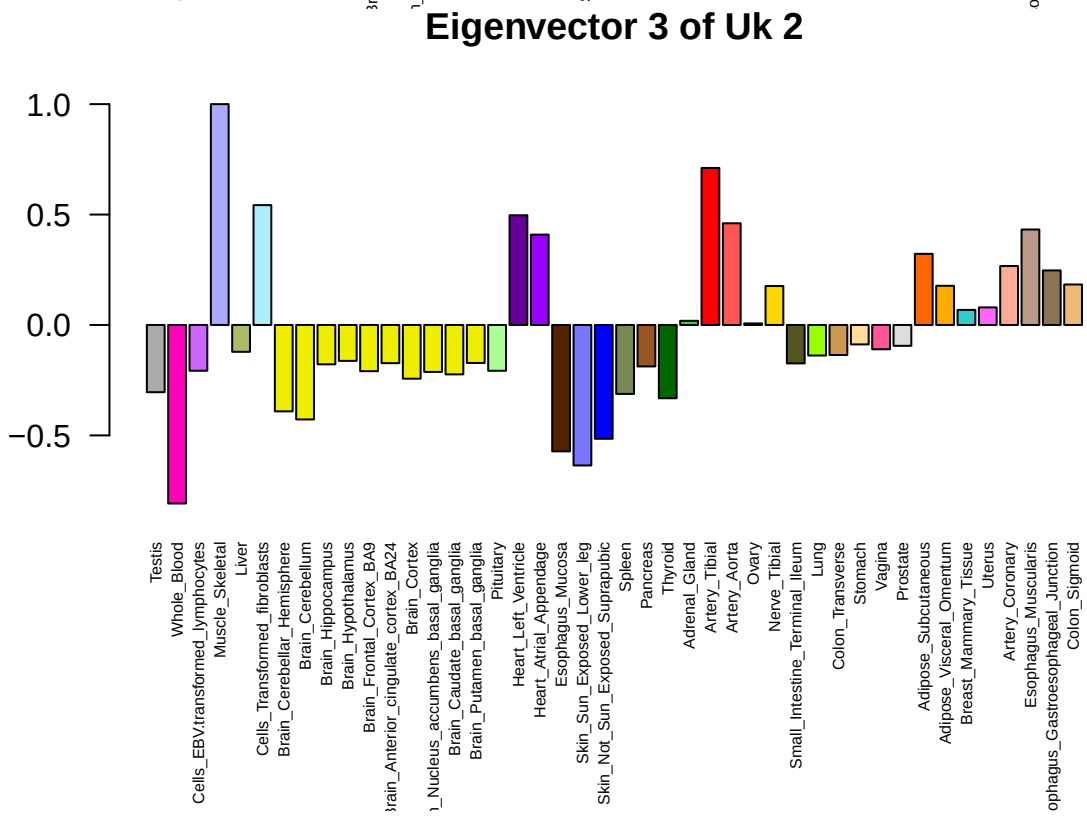




And the SVD Plots:

```
k=2
h=read.table(paste0("uk",k,"rowIndices.txt"))[,1]
for(g in 1:3){
v=svd(covmat[[k]])$v[h,]
rownames(v)=colnames(v)=names(h)
par(mar=c(8,4.1,4.1,2.1))
barplot(v[,g]/v[which.max(abs(v[,g])),g],las=2,main=paste("Eigenvector",g,"of Uk",k),cex.names = 0.5,co
```


Eigenvector 1 of Uk 2
1.0
0.8
0.6
0.4
0.2
0.0
Testis
Whole_Blood
Cells_EBV.transformed_lymphocytes
Muscle_Skeletal
Liver
Cells_Transformed_fibroblasts
Brain_Cerebellar_Hemisphere
Brain_Cerebellum
Brain_Hippocampus
Brain_Hypothalamus
Brain_Frontal_Cortex_BA9
Brain_Anterior_cingulate_cortex_BA24
Brain_Cortex
Brain_Nucleus_accumbens_basal_ganglia
Brain_Caudate_basal_ganglia
Brain_Putamen_basal_ganglia
Pituitary
Heart_Left_Ventricle
Heart_Atrial_Appendage
Esophagus_Mucosa
Skin_Sun_Exposed_Lower_leg
Skin_Not_Sun_Exposed_Suprapubic
Spleen
Pancreas
Thyroid
Adrenal_Gland
Artery_Tibial
Artery_Aorta
Ovary
Nerve_Tibial
Small_Intestine_Terminal_Ileum
Lung
Colon_Transverse
Stomach
Vagina
Prostate
Adipose_Subcutaneous
Adipose_Visceral_Omentum
Breast_Mammary_Tissue
Uterus
Artery_Coronary
Esophagus_Muscularis
Esophagus_Gastroesophageal_Junction
Colon_Sigmoid
1.0
0.5
0.0
−0.5
Testis
Whole_Blood
Cells_EBV.transformed_lymphocytes
Muscle_Skeletal
Liver
Cells_Transformed_fibroblasts
Brain_Cerebellar_Hemisphere
Brain_Cerebellum
Brain_Hippocampus
Brain_Hypothalamus
Brain_Frontal_Cortex_BA9


Eigenvector 3 of Uk 2
1.0
0.5
0.0
−0.5
Testis
Whole_Blood
Cells_EBV.transformed_lymphocytes
Muscle_Skeletal
Liver
Cells_Transformed_fibroblasts
Brain_Cerebellar_Hemisphere
Brain_Cerebellum
Brain_Hippocampus
Brain_Hypothalamus
Brain_Frontal_Cortex_BA9
Brain_Anterior_cingulate_cortex_BA24
Brain_Cortex
Brain_Nucleus_accumbens_basal_ganglia
Brain_Caudate_basal_ganglia
Brain_Putamen_basal_ganglia
Pituitary
Heart_Left_Ventricle
Heart_Atrial_Appendage
Esophagus_Mucosa
Skin_Sun_Exposed_Lower_leg
Skin_Not_Sun_Exposed_Suprapubic
Spleen
Pancreas
Thyroid
Adrenal_Gland
Artery_Tibial
Artery_Aorta
Ovary
Nerve_Tibial
Small_Intestine_Terminal_Ileum
Lung
Colon_Transverse
Stomach
Vagina
Prostate
Adipose_Subcutaneous
Adipose_Visceral_Omentum
Breast_Mammary_Tissue
Uterus
Artery_Coronary
Esophagus_Muscularis
Esophagus_Gastroesophageal_Junction
Colon_Sigmoid