SUPPLEMENTARY TABLE

[Supplementary Table 1.xlsx]

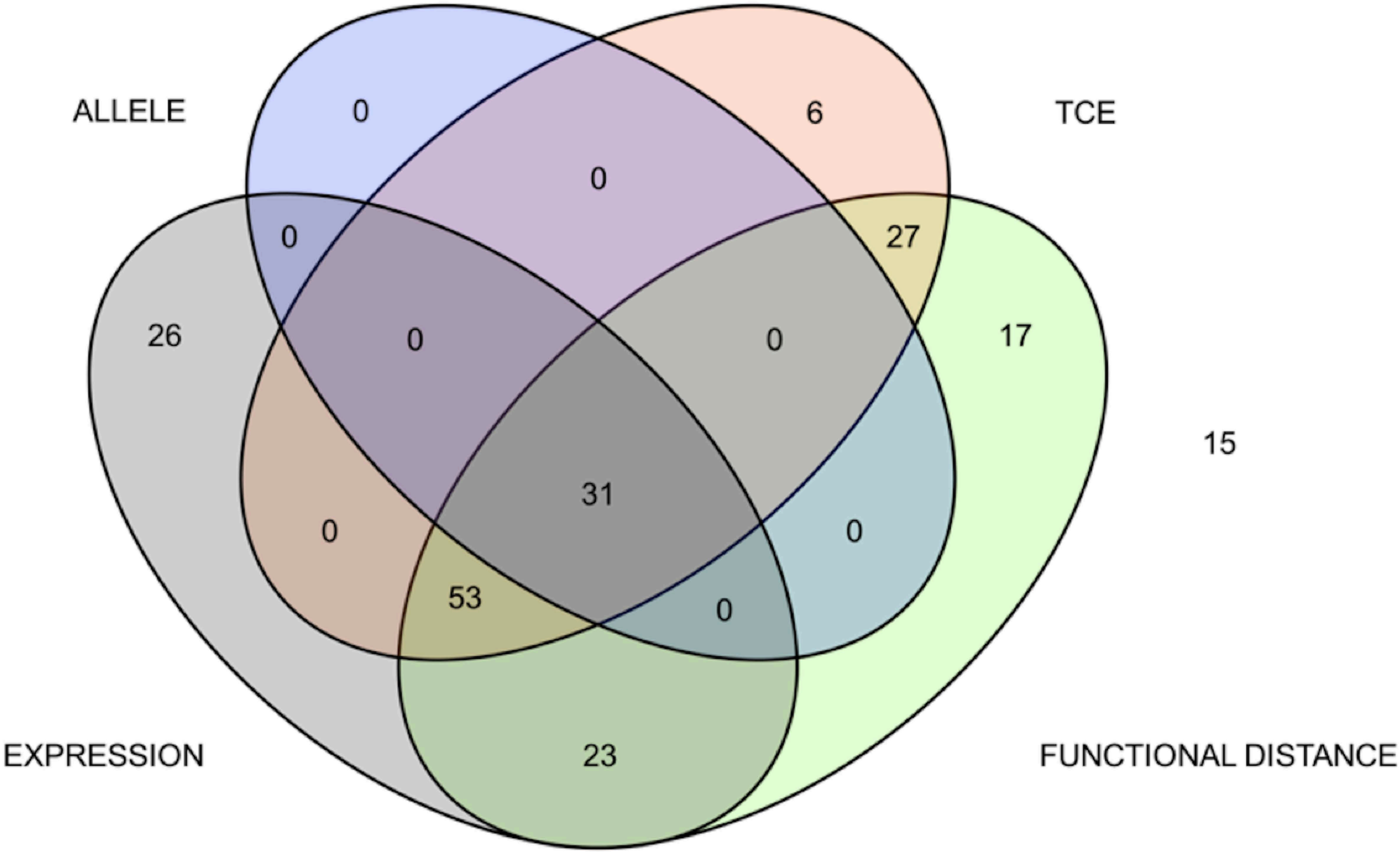
Autosomal MiHAs do not associate with acute GVHD. Each row represents a single MiHA present in the whole genome sequencing (WGS) or microarray cohort (or both) with characterized restricted HLA allele, encoding single nucleotide polymorphism (SNP), gene, and counts in acute GVHD and non-GVHD groups. P-values were calculated, and multiple hypotheses corrected for, as described in Methods. MAF – minor allele frequency.

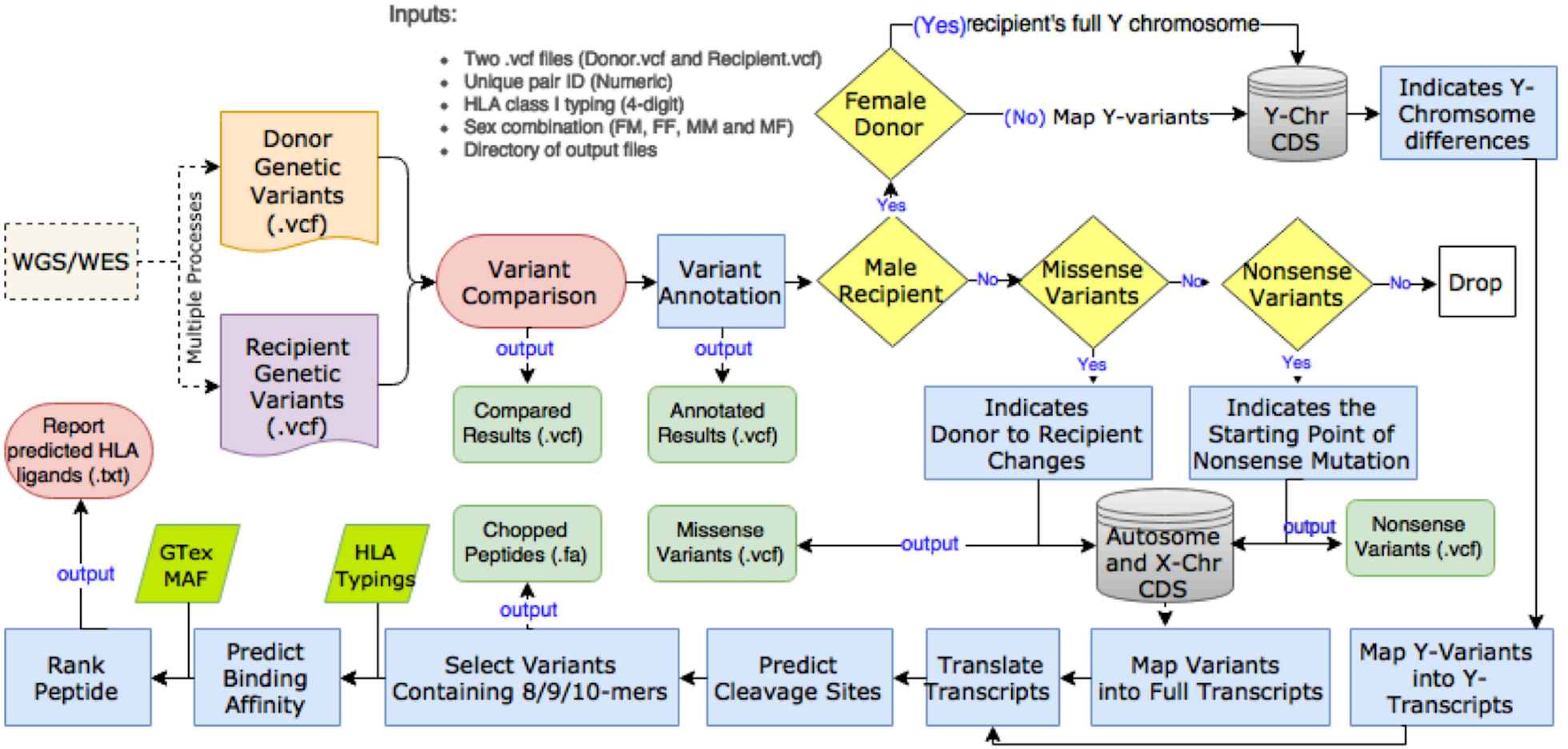
SUPPLEMENTARY FIGURES

Supplementary Figure 1: A Venn diagram shows individual counts in overlapping categories for donor-recipient pairs that were retrospectively matched at HLA-DPB1 by allele, T-cell epitope permissibility (TCE), expression, and functional distance.

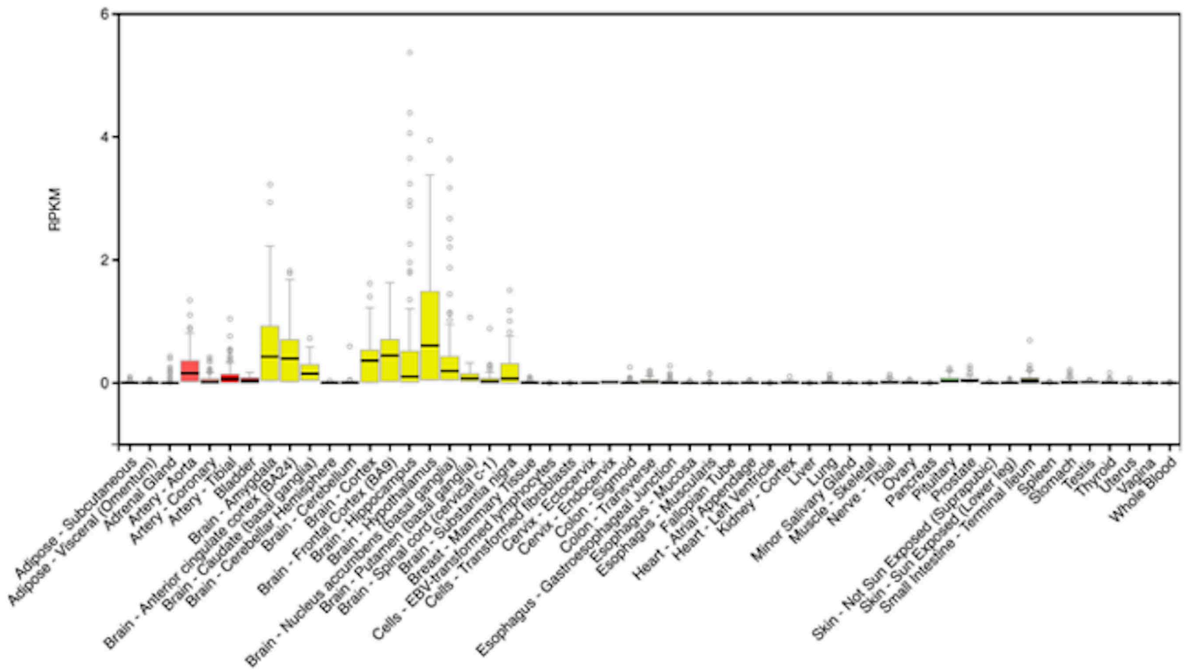
Supplementary Figure 2: A genomic annotation workflow to identify known and novel outcomes-associated variants. Raw sequence data were processed as described (Methods) to generate a single binary alignment (BAM) and variant call format (VCF) file per sample. Comparative analysis of donor-recipient pairs resulted in a single VCF file containing patient-specific variants, which were annotated further. Male recipients with female donors were treated separately to analyze variants on the Y chromosome.

Supplementary Figure 3: Tissue-specific gene expression for PCDH11Y (A), USP9Y (B), UTY (C), and NLGN4Y (D).

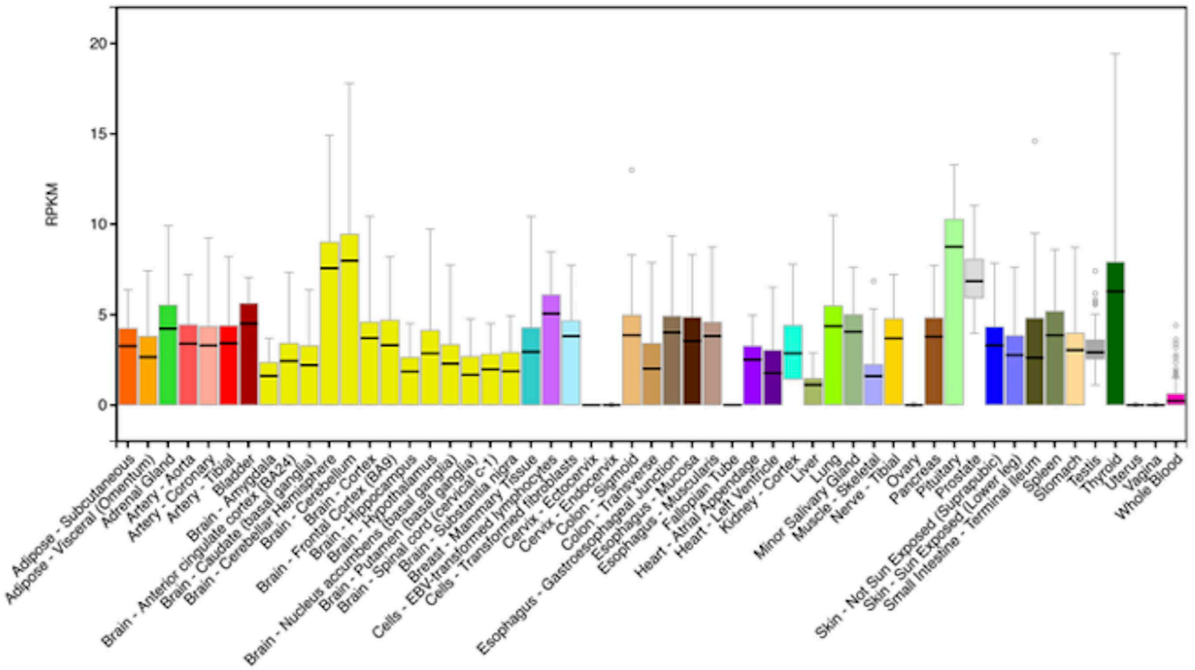

ALLELE
TCE
EXPRESSION
FUNCTIONAL DISTANCE
0
6
0
0
27
26
0
0
17
15
31
0
0
53
0
23


Inputs:
Two .vcf files (Donor.vcf and Recipient.vcf)
Unique pair ID (Numeric)
HLA class I typing (4-digit)
Sex combination (FM, FF, MM and MF)
Directory of output files
WGS/WES
Multiple Processes
Donor Genetic Variants (.vcf)
Recipient Genetic Variants (.vcf)
Variant Comparison
Variant Annotation
output
Compared Results (.vcf)
Annotated Results (.vcf)
Female Donor
(Yes) recipient's full Y chromosome
(No) Map Y-variants
Y-Chr CDS
Indicates Y-Chromsome differences
Yes
Male Recipient
No
Missense Variants
No
Nonsense Variants
No
Drop
Yes
Yes
Indicates Donor to Recipient Changes
Indicates the Starting Point of Nonsense Mutation
Report predicted HLA ligands (.txt)
output
GTex MAF
HLA Typings
Chopped Peptides (.fa)
Missense Variants (.vcf)
output
Autosome and X-Chr CDS
output
Nonsense Variants (.vcf)
output
Rank Peptide
Predict Binding Affinity
Select Variants Containing 8/9/10-mers
Predict Cleavage Sites
Translate Transcripts
Map Variants into Full Transcripts
Map Y-Variants into Y-Transcripts

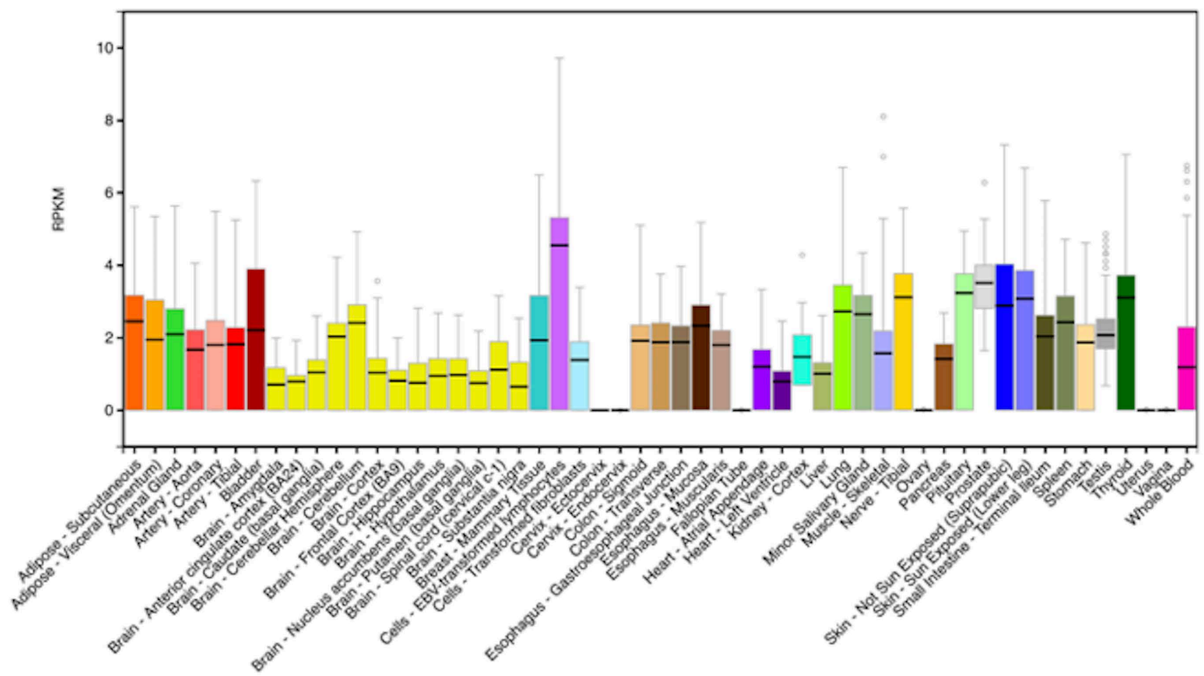
A


RPKM
0
2
4
6
Adipose - Subcutaneous
Adipose - Visceral (Omentum)
Adrenal Gland
Artery - Aorta
Artery - Coronary
Artery - Tibial
Bladder
Brain - Amygdala
Brain - Anterior cingulate cortex (BA24)
Brain - Caudate (basal ganglia)
Brain - Cerebellar Hemisphere
Brain - Cerebellum
Brain - Cortex
Brain - Frontal Cortex (BA9)
Brain - Hippocampus
Brain - Hypothalamus
Brain - Nucleus accumbens (basal ganglia)
Brain - Putamen (basal ganglia)
Brain - Spinal cord (cervical c-1)
Brain - Substantia nigra
Breast - Mammary Tissue
Cells - EBV-transformed lymphocytes
Cells - Transformed fibroblasts
Cervix - Ectocervix
Cervix - Endocervix
Colon - Sigmoid
Colon - Transverse
Esophagus - Gastroesophageal Junction
Esophagus - Mucosa
Esophagus - Muscularis
Fallopian Tube
Heart - Atrial Appendage
Heart - Left Ventricle
Kidney - Cortex
Liver
Lung
Minor Salivary Gland
Muscle - Skeletal
Nerve - Tibial
Ovary
Pancreas
Pituitary
Prostate
Skin - Not Sun Exposed (Suprapubic)
Skin - Sun Exposed (Lower leg)
Small Intestine - Terminal Ileum
Spleen
Stomach
Testis
Thyroid
Uterus
Vagina
Whole Blood

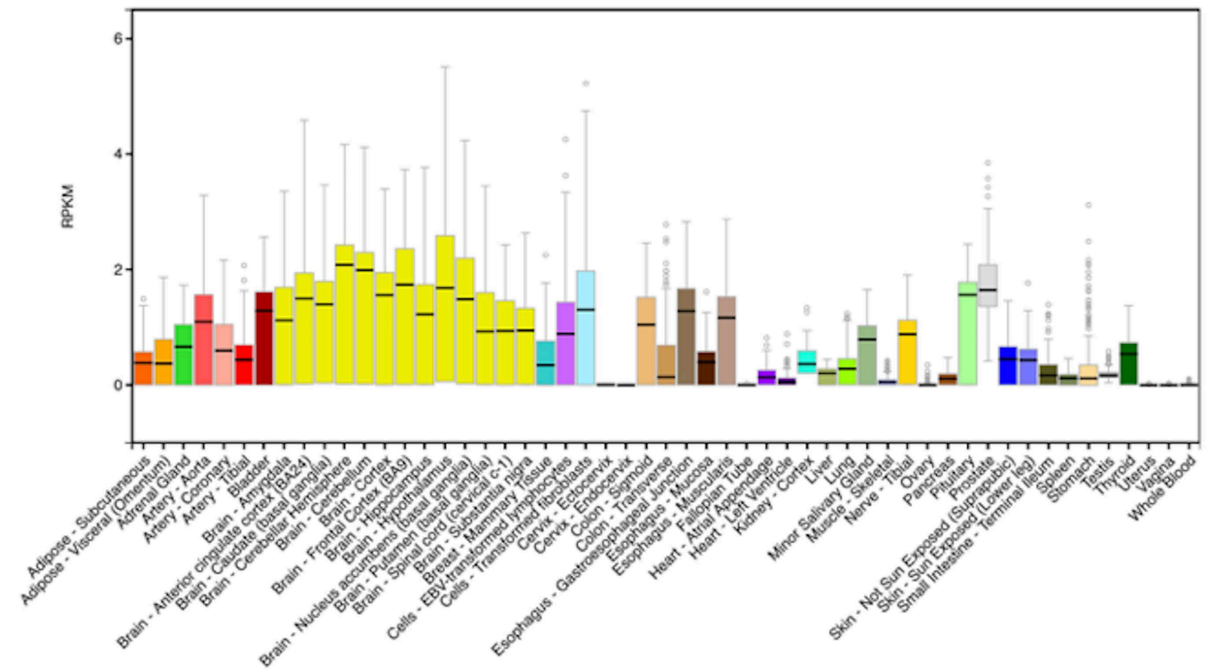
B


RPKM
0
5
10
15
20
Adipose - Subcutaneous
Adipose - Visceral (Omentum)
Adrenal Gland
Artery - Aorta
Artery - Coronary
Artery - Tibial
Bladder
Brain - Amygdala
Brain - Anterior cingulate cortex (BA24)
Brain - Caudate (basal ganglia)
Brain - Cerebellar Hemisphere
Brain - Cerebellum
Brain - Cortex
Brain - Frontal Cortex (BA9)
Brain - Hippocampus
Brain - Hypothalamus
Brain - Nucleus accumbens (basal ganglia)
Brain - Putamen (basal ganglia)
Brain - Spinal cord (cervical c-1)
Brain - Substantia nigra
Breast - Mammary Tissue
Cells - EBV-transformed lymphocytes
Cells - Transformed fibroblasts
Cervix - Ectocervix
Cervix - Endocervix
Colon - Sigmoid
Colon - Transverse
Esophagus - Gastroesophageal Junction
Esophagus - Mucosa
Esophagus - Muscularis
Fallopian Tube
Heart - Atrial Appendage
Heart - Left Ventricle
Kidney - Cortex
Liver
Lung
Minor Salivary Gland
Muscle - Skeletal
Nerve - Tibial
Ovary
Pancreas
Pituitary
Prostate
Skin - Not Sun Exposed (Suprapubic)
Skin - Sun Exposed (Lower leg)
Small Intestine - Terminal Ileum
Spleen
Stomach
Testis
Thyroid
Uterus
Vagina
Whole Blood

C


RPKM
0
2
4
6
8
10
Adipose - Subcutaneous
Adipose - Visceral (Omentum)
Adrenal Gland
Artery - Aorta
Artery - Coronary
Artery - Tibial
Bladder
Brain - Amygdala
Brain - Anterior cingulate cortex (BA24)
Brain - Caudate (basal ganglia)
Brain - Cerebellar Hemisphere
Brain - Cerebellum
Brain - Cortex
Brain - Frontal Cortex (BA9)
Brain - Hippocampus
Brain - Hypothalamus
Brain - Nucleus accumbens (basal ganglia)
Brain - Putamen (basal ganglia)
Brain - Spinal cord (cervical c-1)
Brain - Substantia nigra
Breast - Mammary Tissue
Cells - EBV-transformed lymphocytes
Cells - Transformed fibroblasts
Cervix - Ectocervix
Cervix - Endocervix
Colon - Sigmoid
Colon - Transverse
Esophagus - Gastroesophageal Junction
Esophagus - Mucosa
Esophagus - Muscularis
Fallopian Tube
Heart - Atrial Appendage
Heart - Left Ventricle
Kidney - Cortex
Liver
Lung
Minor Salivary Gland
Muscle - Skeletal
Nerve - Tibial
Ovary
Pancreas
Pituitary
Prostate
Skin - Not Sun Exposed (Suprapubic)
Skin - Sun Exposed (Lower leg)
Small Intestine - Terminal Ileum
Spleen
Stomach
Testis
Thyroid
Uterus
Vagina
Whole Blood

D


RPKM
0
2
4
6
Adipose - Subcutaneous
Adipose - Visceral (Omentum)
Adrenal Gland
Artery - Aorta
Artery - Coronary
Artery - Tibial
Bladder
Brain - Amygdala
Brain - Anterior cingulate cortex (BA24)
Brain - Caudate (basal ganglia)
Brain - Cerebellar Hemisphere
Brain - Cerebellum
Brain - Cortex
Brain - Frontal Cortex (BA9)
Brain - Hippocampus
Brain - Hypothalamus
Brain - Nucleus accumbens (basal ganglia)
Brain - Putamen (basal ganglia)
Brain - Spinal cord (cervical c-1)
Brain - Substantia nigra
Breast - Mammary Tissue
Cells - EBV-transformed lymphocytes
Cells - Transformed fibroblasts
Cervix - Ectocervix
Cervix - Endocervix
Colon - Sigmoid
Colon - Transverse
Esophagus - Gastroesophageal Junction
Esophagus - Mucosa
Esophagus - Muscularis
Fallopian Tube
Heart - Atrial Appendage
Heart - Left Ventricle
Kidney - Cortex
Liver
Lung
Minor Salivary Gland
Muscle - Skeletal
Nerve - Tibial
Ovary
Pancreas
Pituitary
Prostate
Skin - Not Sun Exposed (Suprapubic)
Skin - Sun Exposed (Lower leg)
Small Intestine - Terminal Ileum
Spleen
Stomach
Testis
Thyroid
Uterus
Vagina
Whole Blood