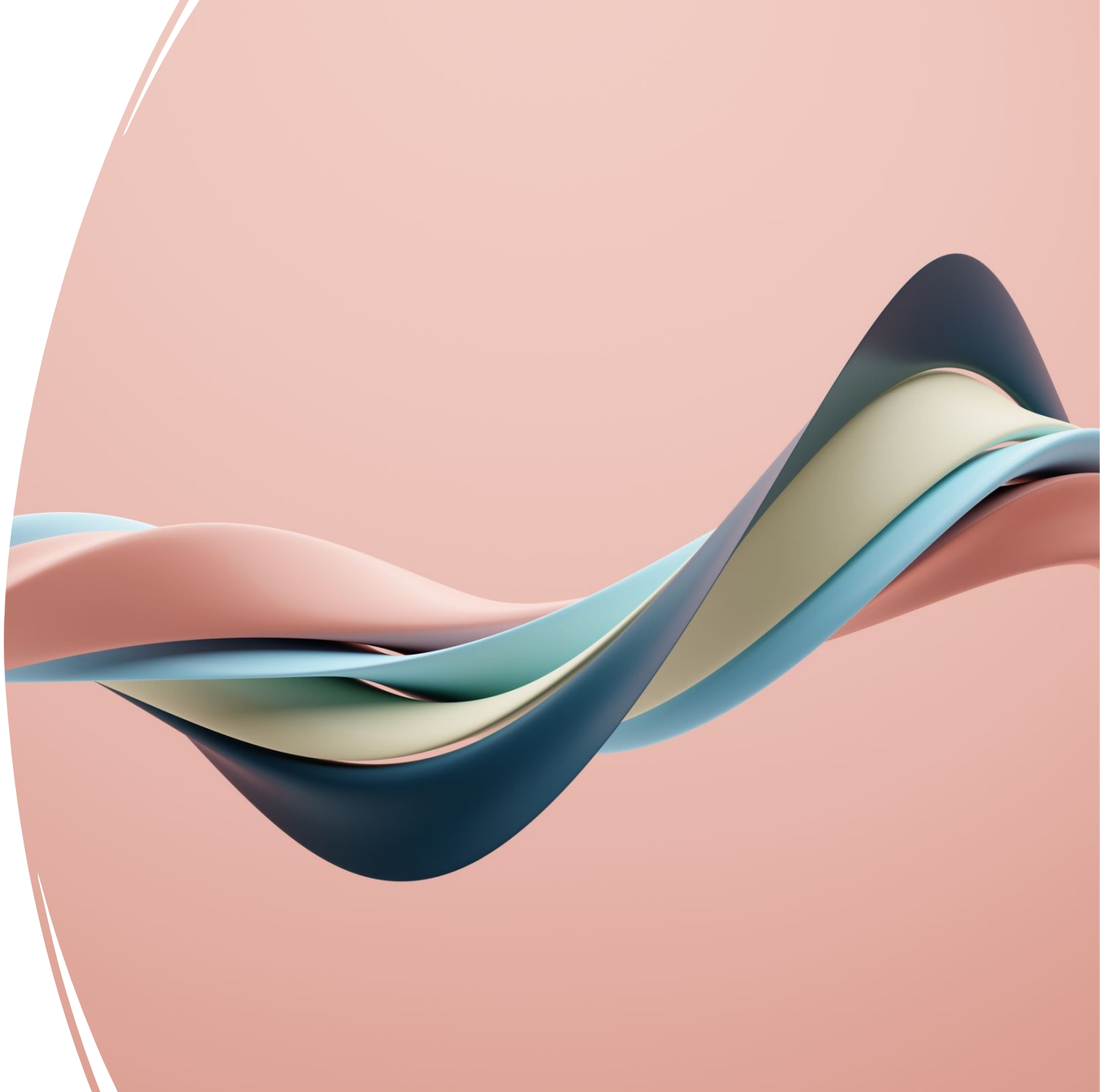
BULK RNA-SEQ ANALYSIS

BCG - GENOMICS AND TRANSCRIPTOMICS

A.A. 2023-2024

SABRINA PERVIN ABU



QUALITY CONTROL

MAT. 30507A

The thresholds set are

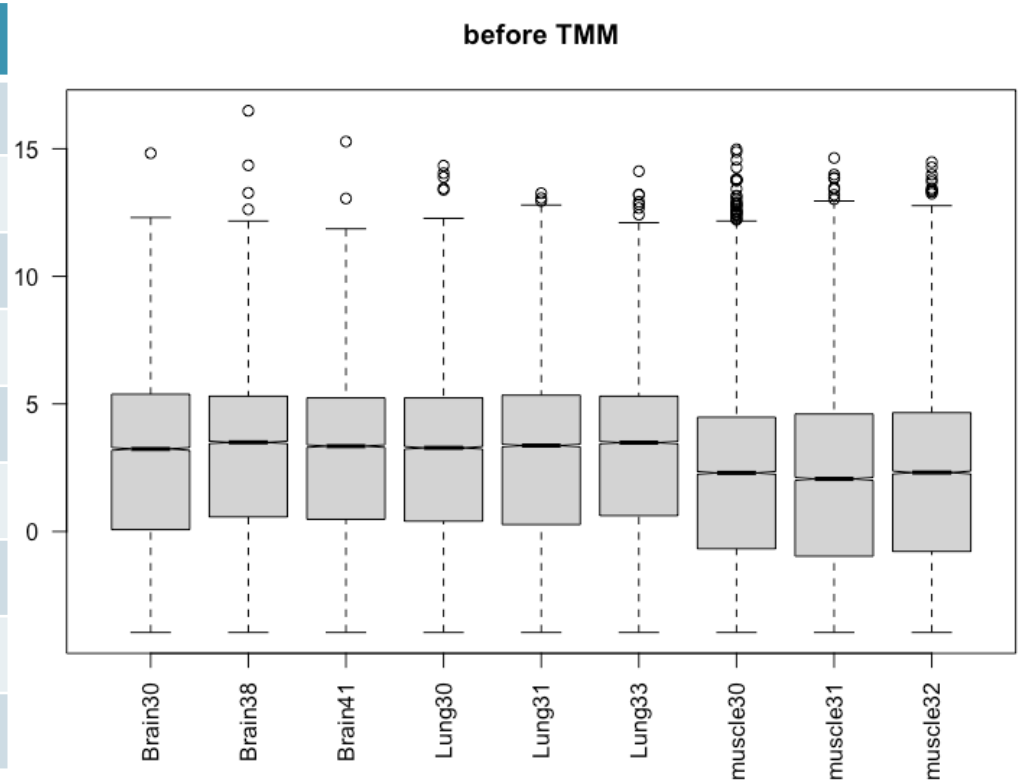
- RIN >= 6
- rRNA fraction <= 10%
- uniquely mapped reads >= 85%

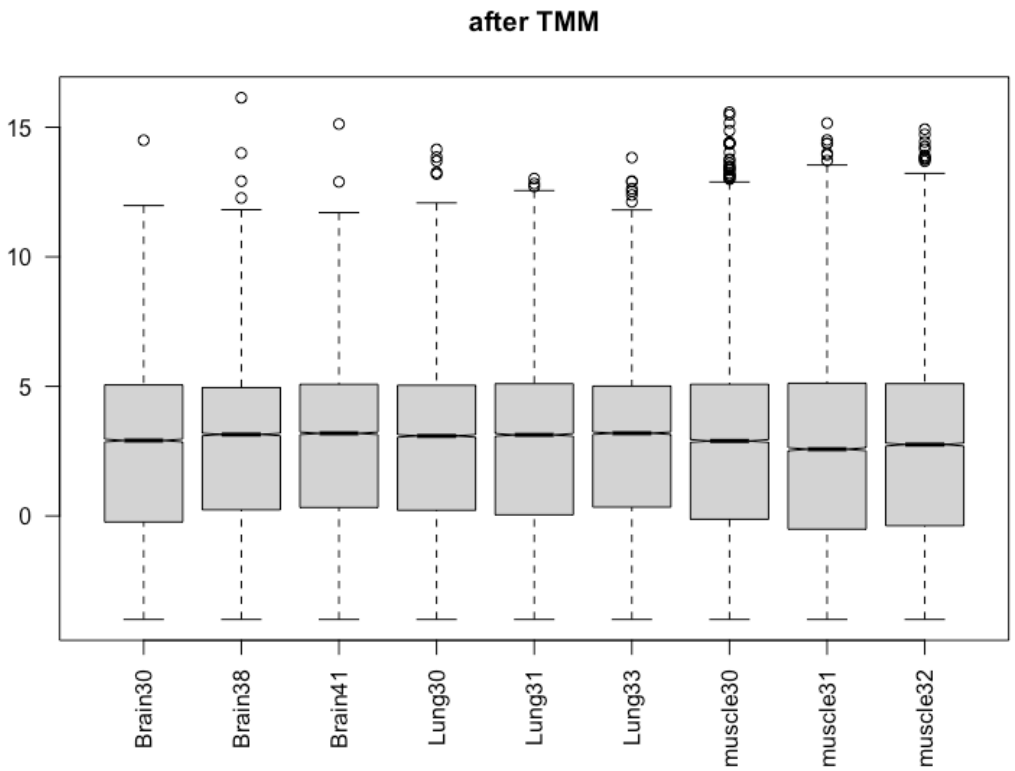
	BRAIN			LUNG			MUSCLE		
SAMPLE	30	38	41	30	31	33	30	31	32
RIN	7.4	7.2	7.3	8.4	8.4	7.7	7	8.4	7.5
%rRNA	0.023	0.078	0.037	0.004	0.008	0.005	0.013	0.012	0.011
%map	87.9	91.3	88	91.2	91.8	89.4	89.2	92.1	89.6

Genes with low/no expression on all 9 samples are removed:
54042 → 23038

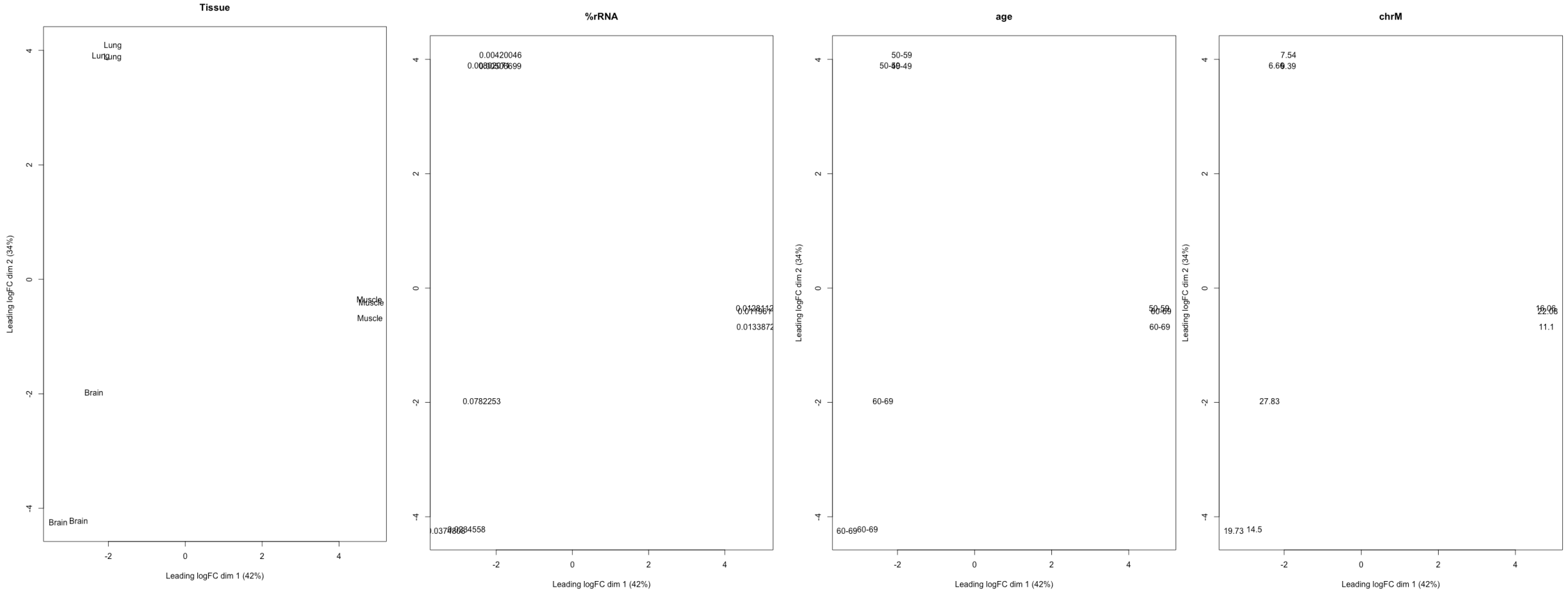
NORMALIZATION

Sample	Norm. factors
BRAIN 30	1.2550309
BARIN 38	1.2764998
BRAIN 41	1.1163924
LUNG 30	1.1445551
LUNG 31	1.1822037
LUNG 33	1.2258074
MUSCLE 30	0.6588416
MUSCLE 31	0.6981477
MUSCLE 32	0.7328724

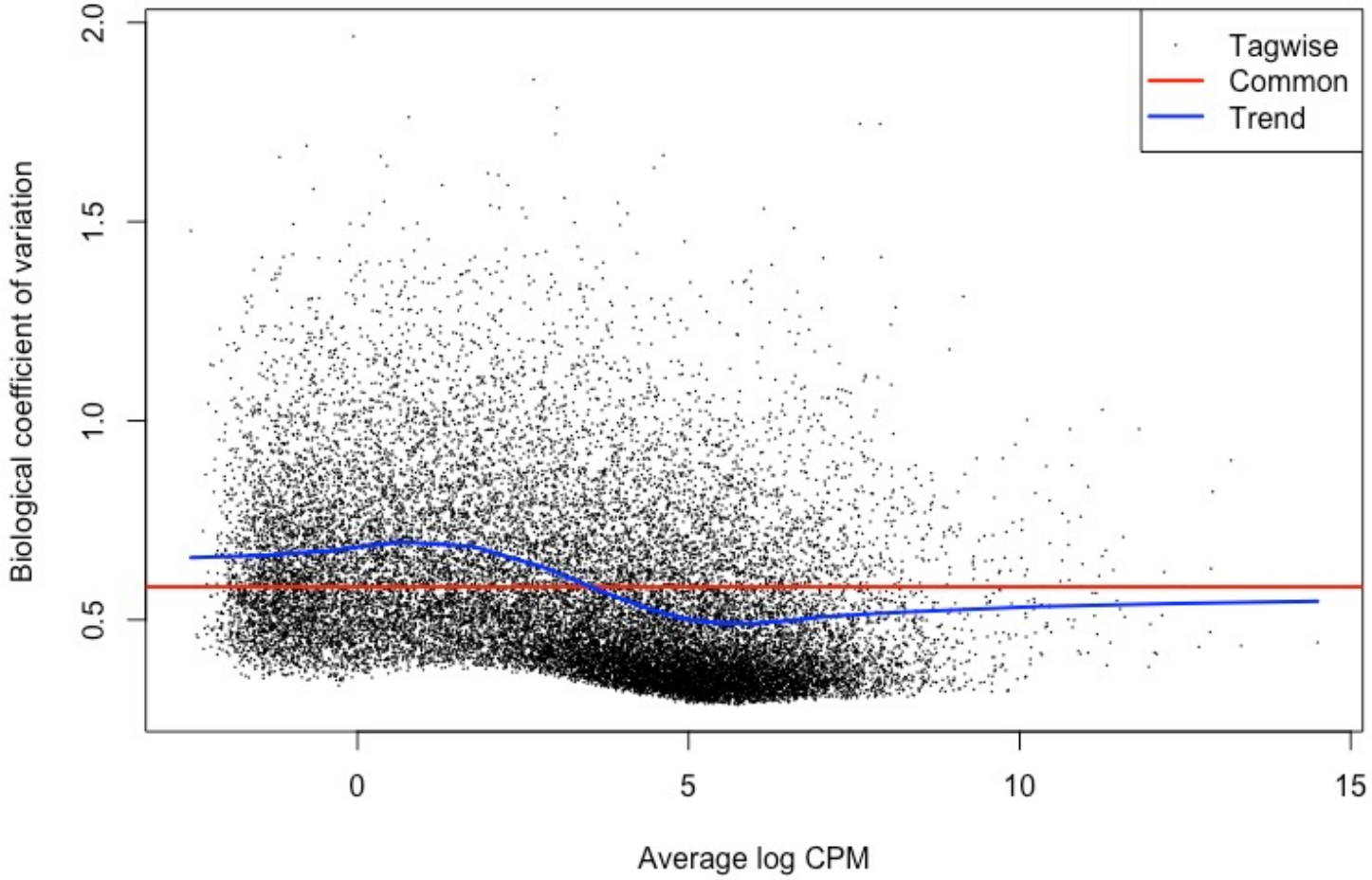




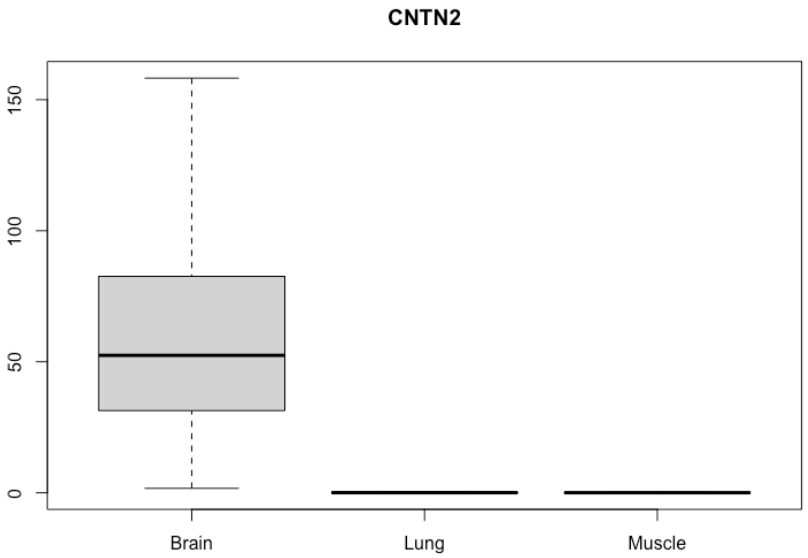
SAMPLES 2D VISUALIZATION

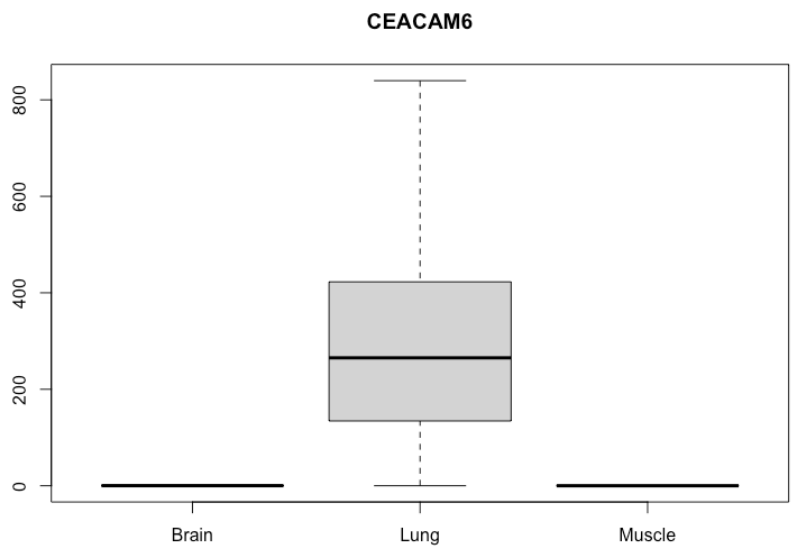


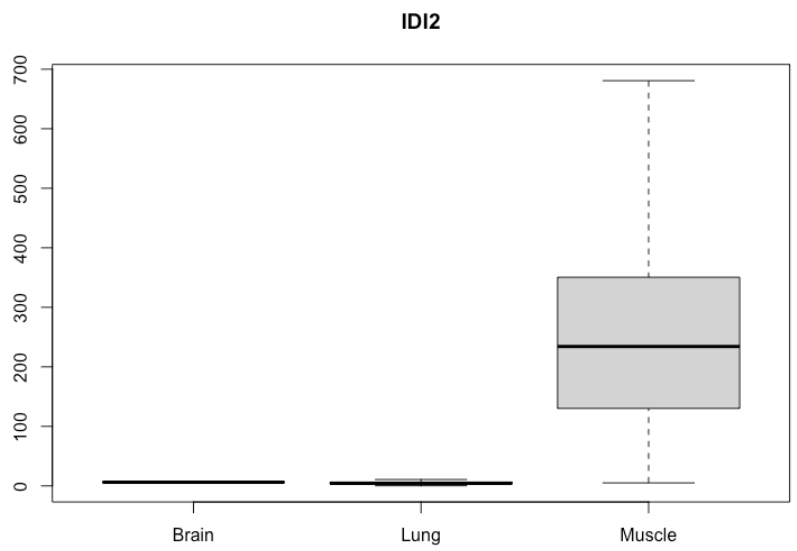
MEAN AND VARIANCE



UP-REGULATED GENES



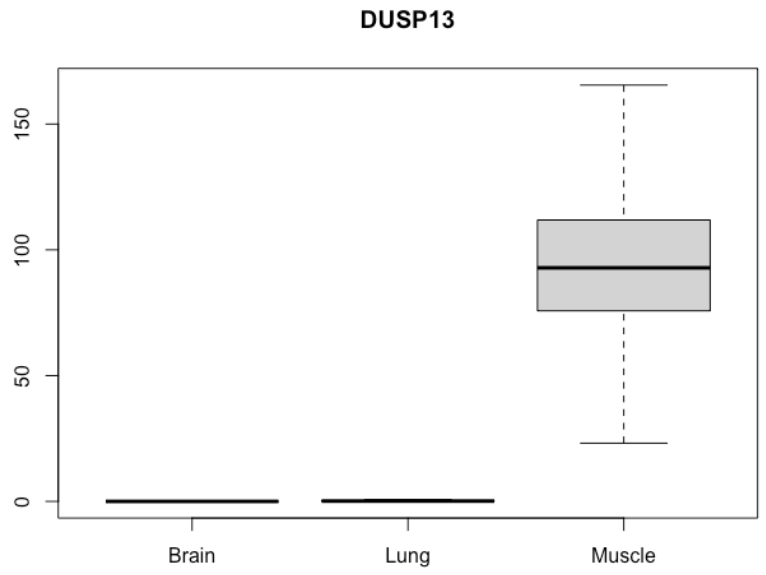




UP-REGULATED GENES IN BRAIN	
vs LUNG	vs MUSCLE
895	1732

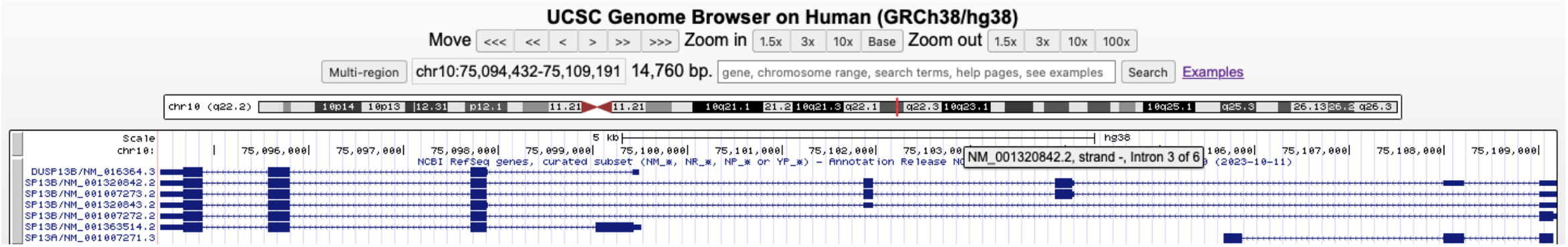
UP-REGULATED GENES IN LUNG	
vs BRAIN	vs MUSCLE
876	1523

UP-REGULATED GENES IN MUSCLE	
vs BRAIN	vs LUNG
1691	1665



DUSP13

DUSP13		
	Dual Specificity Phosphatase 13	
BIOLOGICAL PROCESS	Negative Regulation Of MAPK Cascade	GO:0043409
	Dephosphorylation	GO:0016311
	Phosphate-Containing Compound Metabolic Process	GO:0006796
	Regulation Of MAPK Cascade	GO:0043408
	Negative Regulation Of Intracellular Signal Transduction	GO:1902532
MOLECULAR FUNCTION	MAP Kinase Phosphatase Activity	GO:0033549
	Protein Tyrosine/Serine/Threonine Phosphatase Activity	GO:0008138
	Phosphoric Ester Hydrolase Activity	GO:0042578
	Phosphatase Activity	GO:0016791



FUNCTIONAL ENRICHMENT (TOP 500 DE GENES)

	BRAIN		LUNG		MUSCLE	
	GO ANNOTATION	FDR	GO ANNOTATION	FDR	GO ANNOTATION	FDR
BIOLOGICAL PROCESS	Nervous System Development (GO:0007399)	1.762e-13	B Cell Receptor Signaling Pathway	0.000001936	Cellular Respiration	1.117e-30
MOLECULAR FUNCTION	Voltage-Gated Monoatomic Cation Channel Activity	0.006338	Immunoglobulin Receptor Binding	0.004326	Oxidoreduction-Driven Active Transmembrane Transporter Activity	1.490e-23
CELLULAR COMPONENT	Neuron Projection	5.765e-21	Lamellar Body	3.328e-8	Mitochondrial Inner Membrane	2.608e-27