Write-Up ADDIS Re-run and Verification

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Re-analysis of GTEx Using MRPC-ADDIS

DETAILED DESCRIPTION:

(1) Implementation of the ADDIS improvement to the MRPC algorithm: This involved adapting the existing scripts developed by M. Badsha to rerun the GTEx data using the ADDIS version of the FDR control. **(2)** The distribution of model types (M0, M1, ... M4, Other) relative to each tissue was retained from the analyses for both **MRPC-LOND** and **MRPC-ADDIS** for comparison. Additionally, a host of programs were developed to identify the specific classification of each trio analyzed in each tissue.**(3)** These programs were further adapted to identify the number of trios for each tissue classified as cis or trans mediated (M1 type 1 or M1 type 2). Such information was again compared with results from **MRPC LOND** with the intention of understanding the differences in inferred networks between the two FDR control methods.

MAIN POINTS:

(1) Re-run of GTEx data with MRPC using the ADDIS FDR control

• Used the general format of the scripts created by M.Badsha to run MRPC on GTEx data for all available tissues.
• created a looped version of the script which runs and outputs the list of classifications and model counts for each table for seemless re-analysis

(2) Summarizing of differences between LOND and ADDIS

• The distribution of trio classifications for each tissue were quantified as the number of trios (counts) allocated to each model type (M0, M1, ... M4, Other)
• These counts compared numerically and visually to further analyze differences between distribution of model types between **ADDIS** and **LOND**
• Lastly, we followed up on differences between FDR methods at a finer level by investigating classification changes of individual trios and differences between their adjacency matrix

(3) Summarizing differences between LOND and ADDIS - Cis/Trans Mediation models

• We extracted the M1 classified trios for both **ADDIS** and **LOND** and classified them as Type-1 (cis mediated) and Type-2 (trans-mediated) by the structure of the adjacency matrix

• constructed a table of the frequency (counts) and relative proportion of M1-Type-1 and M2-Type-2 mediation models for each method and all tissues
• Summarized and compared mediation model trios of (Type-1,Type-2) numerically and visually for both **ADDIS** and **LOND**

Summarizing Information For LOND/ADDIS Comparisons

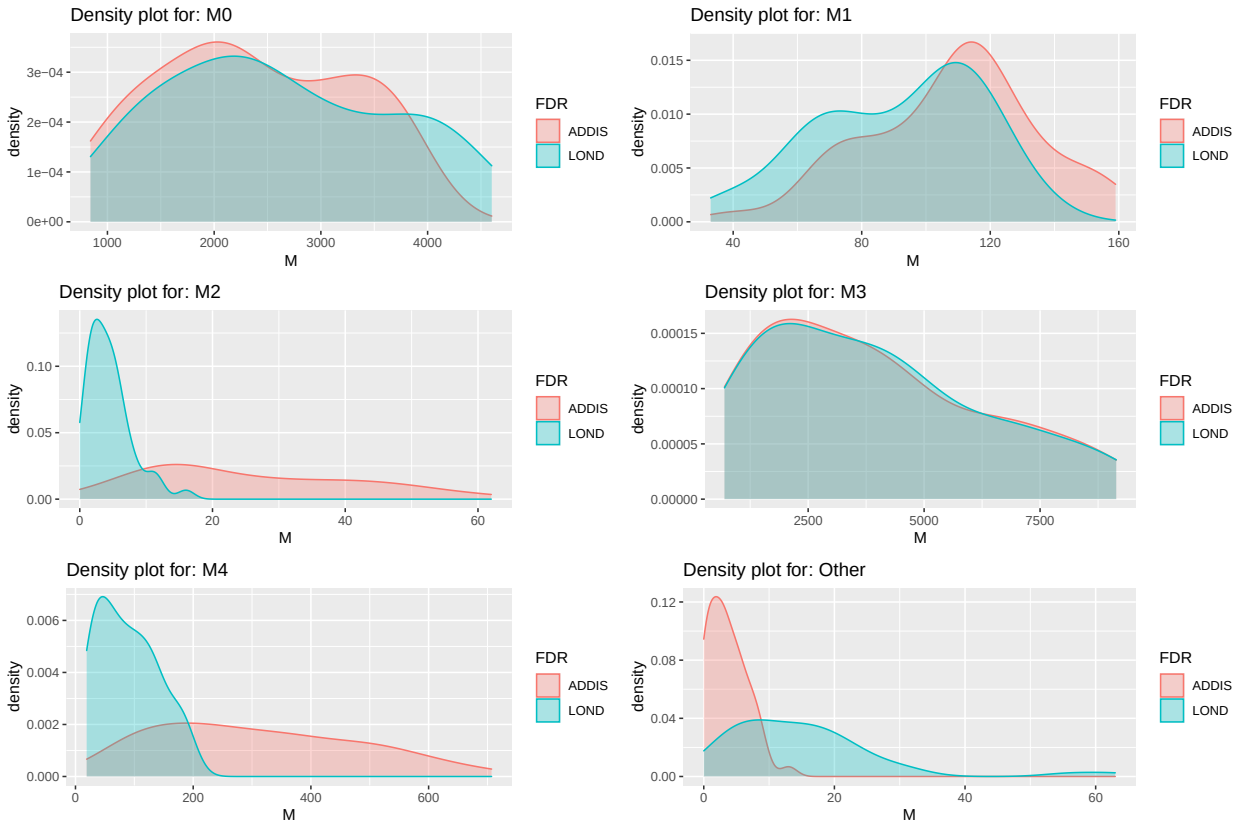

Figure 1: Density plots showing the distribution of each graph type under both ADDIS and LOND

Table 1: table of the average difference in count and percentage between ADDIS and LOND and their standard errors for the differences

	M0	M1	M2	M3	M4	Other
mean.change.ct	-235.06250	16.47917	21.41667	-13.83333	222.45833	-11.45833
SD.change.ct	187.55248	12.39078	13.72191	127.75214	121.25373	10.03814
mean.change%	-0.01742	0.00116	0.00166	-0.00107	0.01653	-0.00085
SD.change%	0.02104	0.00200	0.00186	0.01165	0.01706	0.00125

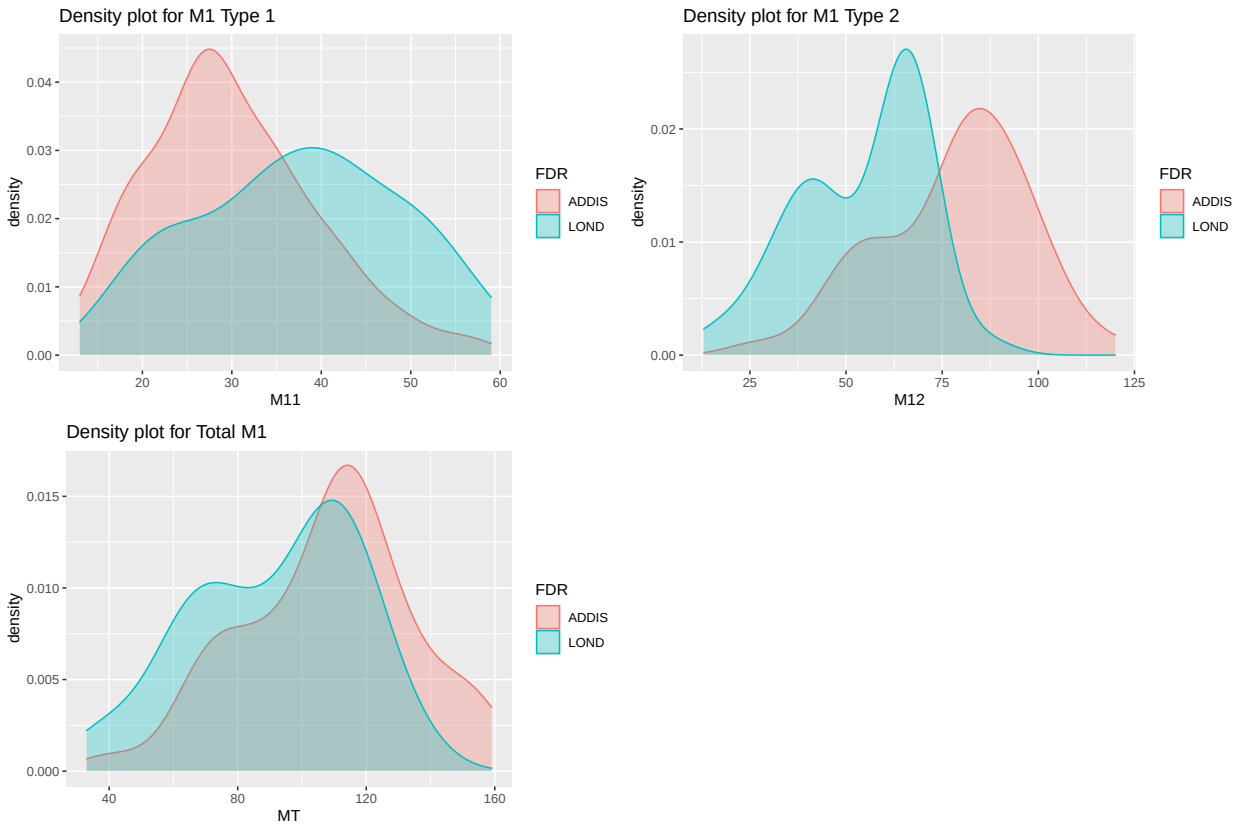

Figure 2: Density plots summarizing the differences between the relative counts for model 1 type 1 (M11) and Model 2 type 2 (M12) as well as the total distribution of Model 1's (MT)