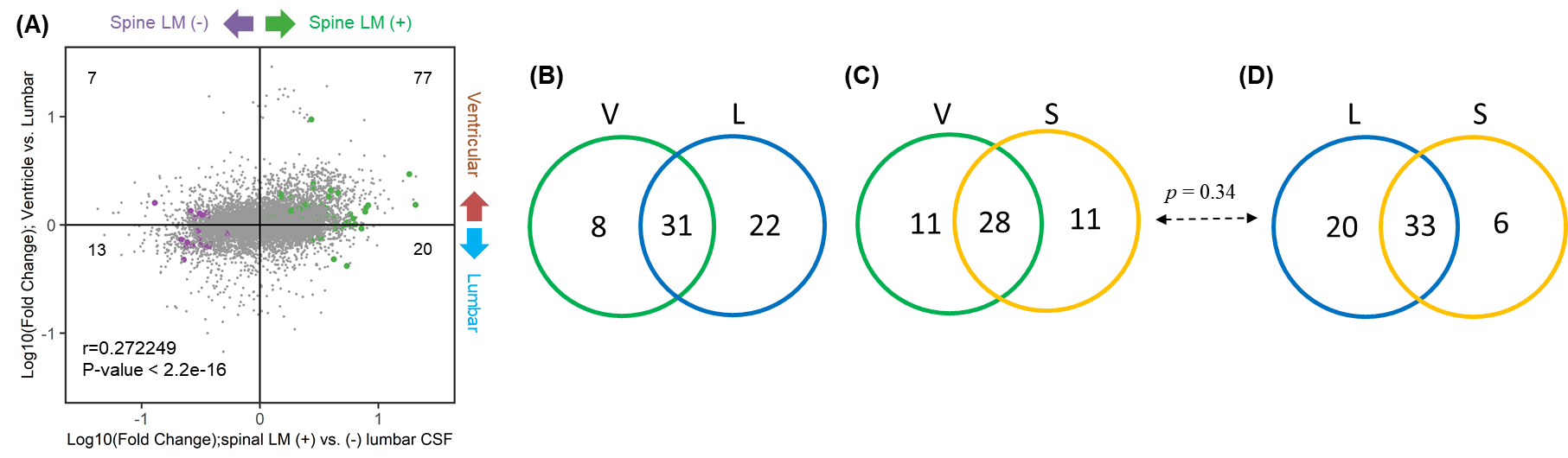


**Supplementary Figure 1.** Kyoto Encyclopedia of Genes and Genomes-based metabolite enrichment analysis at MetaboAnalylst online platform (ver.4.0) using discriminative LMIs of (A) lumbar, (B) ventricular CSF, and spinal LM (+) CSF. The P-value indicates the probability of seeing at least a particular number of metabolites from a certain metabolite set in discriminative LMI candidates.



**Supplementary Figure 2.** (A) Volcano plot illustrating the similarity of LMIs distribution between discriminative lumbar (over ventricular) and spinal LM (+) (over spinal LM (–)) CSF samples. Pearson’s correlation coefficient r was calculated in R (ver. 3.6.0). Venn diagram illustrating number of metabolic pathways designated by (B) lumbar vs. ventricular discriminative LMIs, (C) ventricular and spinal LM (+) discriminative LMIs, and (D) lumbar and spinal LM (+) discriminative LMIs.