Legend: Self-trained PCA, scGPT, scFoundation, GEARS, Random Gene, Random Pert
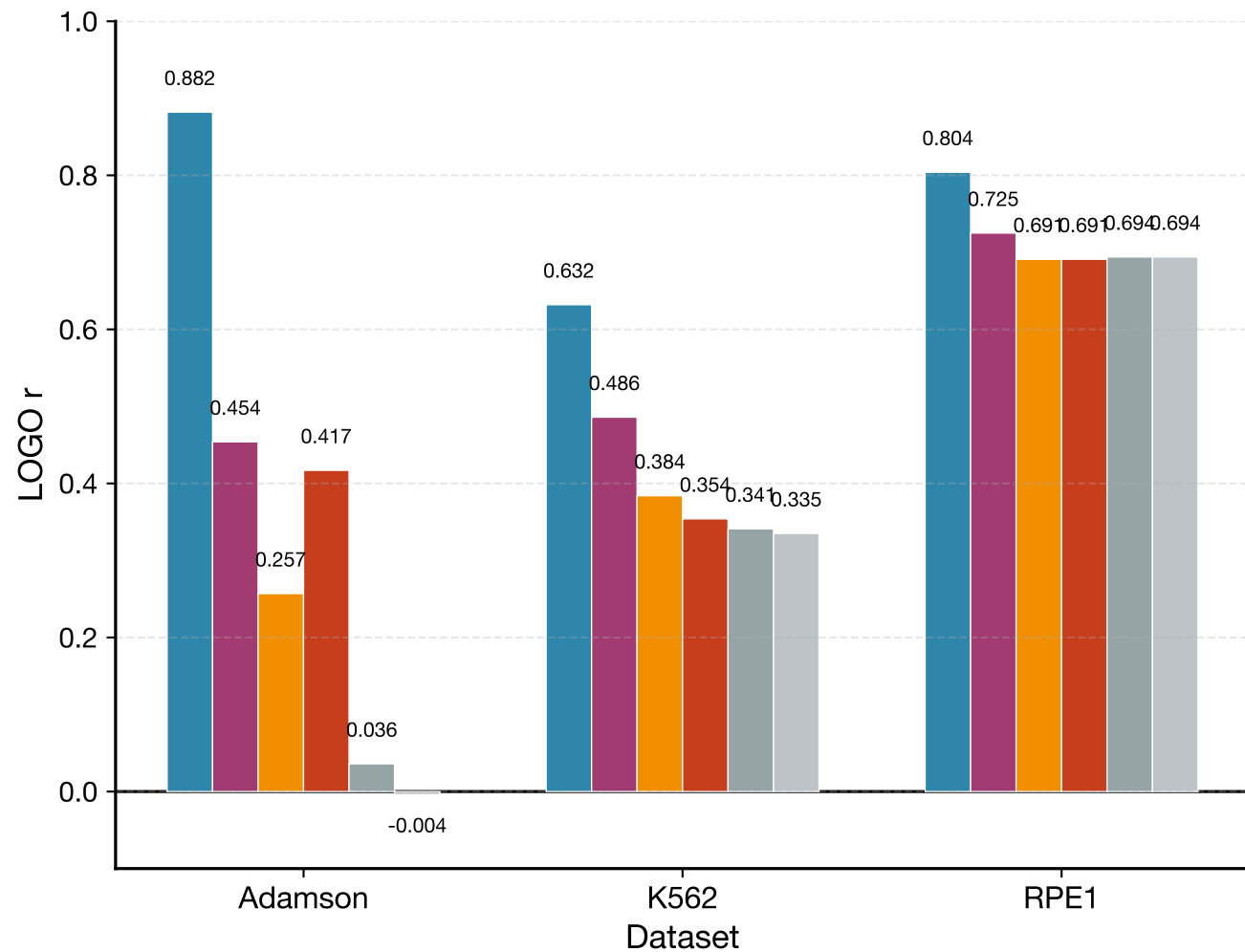
Pseudobulk Resolution

Dataset	Self-trained PCA	scGPT	scFoundation	GEARS	Random Gene	Random Pert
Adamson	0.882	0.454	0.257	0.417	0.036	-0.004
K562	0.632	0.486	0.384	0.354	0.341	0.335
RPE1	0.804	0.725	0.691	0.691	0.694	0.694

Single-Cell Resolution

Dataset	Self-trained PCA	scGPT	scFoundation	GEARS	Random Gene	Random Pert
Adamson	0.309	0.183	0.091	0.139	0.001	0.004
K562	0.259	0.193	0.112	0.073	0.069	0.068
RPE1	0.414	0.344	0.270	0.254	0.254	0.253