

Supplementary Material

1 SUPPLEMENTARY TABLES AND FIGURES

Proportion of LPLSG sample data categories

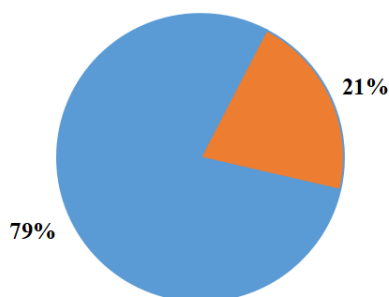


Figure S1. In the LPLSG experiment, 4152 lncRNA-protein interactions, including 982 lncRNAs and 24 proteins, the proportion of lncRNAs and proteins in negative samples to the total sample category is shown in the figure, which the blue area represents 79% of the total sample proportion, and the orange region represents the sample category that has not been selected.

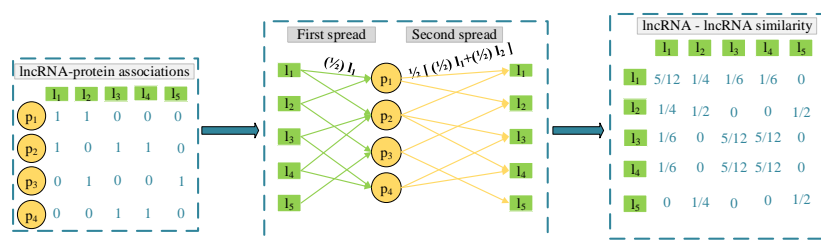


Figure S2. lncRNA-lncRNA similarity calculation process. (1) The binary matrix represents the known lncRNA-protein associations; (2) The green arrows are the process of the starting node lncRNAs to the proteins resource propagation, $(1/2) l_1$ represents the propagation proportion of $l_1 \rightarrow p_1$; The yellow arrows are the proteins to the lncRNAs resource propagation process, $(1/2) [(1/2) l_1 + (1/2) l_2]$ represents the propagation proportion of $p_1 \rightarrow l_1$; (3) Represent the similarity between lncRNA-lncRNA calculated by the Resource Allocation algorithm.

$$\begin{aligned}
(1) \quad & \begin{pmatrix} 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 1 & 0 \end{pmatrix} \xrightarrow{\text{Score}_{lp}} \begin{pmatrix} 0 & 0 & 0.17 & 0.17 & 0.4 \\ 0 & 0.25 & 0 & 0 & 0 \\ 0.2 & 0 & 0 & 0 & 0 \\ 0.33 & 0 & 0 & 0 & 0 \end{pmatrix} \\
(2) \quad & \begin{pmatrix} 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 1 & 0 \end{pmatrix} \xrightarrow{\text{Score}_{pl}} \begin{pmatrix} 0 & 0 & 0.18 & 0.18 & 0.27 \\ 0 & 0.2 & 0 & 0 & 0 \\ 0.25 & 0 & 0 & 0 & 0 \\ 0.4 & 0 & 0 & 0 & 0 \end{pmatrix}
\end{aligned}$$

Figure S3. In the figure, matrix formula 1 indicates that the Score_{lp} prediction score matrix is calculated by taking the lncRNA data set L in the binary network as the starting node set. Matrix formula 2 indicates that the Score_{pl} prediction score matrix is obtained by taking the protein data set P in the binary network as the starting node set. It can be seen from the figure that Score_{lp} and Score_{pl} are not equal and asymmetric, so our proposed LPLSG fusion Score_{lp} and Score_{pl} is not redundant and feasible.

Table S1. According to the experimental evaluation results of RWR algorithm under different restart probability w, the vertical axis index represents six evaluation indicators, and the horizontal axis indicator represents w with different values ($0 < w < 1$).

w	AUPR	AUC	F1_Score	Acc	Recall	Precision
0.1	0.280	0.801	0.350	0.945	0.362	0.340
0.2	0.268	0.798	0.340	0.942	0.364	0.324
0.3	0.256	0.795	0.324	0.940	0.355	0.300
0.4	0.243	0.791	0.302	0.933	0.351	0.269
0.5	0.230	0.786	0.285	0.929	0.341	0.256
0.6	0.216	0.779	0.267	0.922	0.345	0.228
0.7	0.202	0.772	0.251	0.915	0.340	0.216
0.8	0.189	0.762	0.235	0.902	0.360	0.192
0.9	0.174	0.750	0.220	0.916	0.287	0.193

Table S2. According to the experimental evaluation results of LP (label propagation) algorithm under different propagation probability p, the vertical axis index represents six evaluation indicators, and the horizontal axis indicator represents p with different values ($0 < p < 1$).

p	AUPR	AUC	F1_Score	Acc	Recall	Precision
0.1	0.233	0.809	0.319	0.932	0.387	0.271
0.2	0.229	0.808	0.315	0.931	0.387	0.266
0.3	0.224	0.806	0.312	0.933	0.374	0.272
0.4	0.215	0.804	0.309	0.938	0.341	0.285
0.5	0.207	0.801	0.303	0.932	0.360	0.266
0.6	0.201	0.780	0.295	0.934	0.340	0.270
0.7	0.195	0.793	0.281	0.932	0.325	0.254
0.8	0.188	0.788	0.271	0.927	0.335	0.233
0.9	0.182	0.780	0.263	0.933	0.292	0.252

Table S3. In the LPLSG prediction score matrix, the prediction scores are ranked from large to small. We collected the top 10 lncRNAs of each protein, and verified 52 lncRNAs of 14 proteins by NPInter4.0 database.

Protein	Confirmed lncRNA	Protein	Confirmed lncRNA
9606.ENSP00000354951	NONHSAT001511	9606.ENSP00000254108	NONHSAT078782
	NONHSAT084827		NONHSAT079548
	NONHSAT041921		NONHSAT075799
	NONHSAT137541		NONHSAT146833
9606.ENSP00000379144	NONHSAT022115	9606.ENSP00000381031	NONHSAT125791
	NONHSAT145923		NONHSAT068391
9606.ENSP00000350028	NONHSAT022115		NONHSAT112119
	NONHSAT135822		NONHSAT079548
	NONHSAT006360		NONHSAT080206
	NONHSAT001953	9606.ENSP00000413035	NONHSAT022115
	NONHSAT134020		NONHSAT001953
	NONHSAT072962		NONHSAT021830
	NONHSAT104512		NONHSAT041921
	NONHSAT054716		NONHSAT137541
9606.ENSP00000401371	NONHSAT135822	9606.ENSP00000371634	NONHSAT022115
	NONHSAT080206	9606.ENSP00000240185	NONHSAT138142
	NONHSAT084827		NONHSAT001953
	NONHSAT079374		NONHSAT007667
	NONHSAT104512		NONHSAT099431
9606.ENSP00000349428	NONHSAT056046	9606.ENSP00000258729	NONHSAT066082
	NONHSAT145923		NONHSAT125498
	NONHSAT084827		NONHSAT004818
9606.ENSP00000385269	NONHSAT145960		NONHSAT011609
	NONHSAT007673	9606.ENSP00000220592	NONHSAT122291
	NONHSAT021854		NONHSAT123138
9606.ENSP00000338371	NONHSAT145923		NONHSAT101022