Since in all the compared methods, GTAN, VADLP and CNNLDA utilized the same dataset about the lncRNAs, diseases, and miRNAs with our method, we conducted the control experiments on these methods and our method (GSMV). For each method, we randomly generated 1000, 2000, 3000, 4000, and 2687 (the number of original positive samples) connection edges as the positive samples, and then performed 5-fold cross-validation to evaluate the prediction performance. As shown in Supplementary Table ST2, not only GSMV, but also GTAN, VADLP and CNNLDA achieved much better performances than their control experiments. The possible reason is that there are closed relationships among the actual known lncRNA-disease associations (positive samples) and the similarities and associations about the lncRNAs, diseases, and miRNAs. When we randomly generate the lncRNA-disease connections, the closed relationships were damaged.

Supplementary Table ST2. The result of control experiment by randomly selecting lncRNA-disease connections as positive samples

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1000 selected connections | 2000 selected connections | 3000 selected connections | 4000 selected connections | 2687 selected connections | 2687 actual associations |
| GSMV | **AUC: 0.702** | AUC: 0.692 | AUC: 0.713 | AUC: 0.745 | **AUC: 0.724** | **AUC: 0.983** |
| GTAN | AUC: 0.692 | **AUC: 0.735** | **AUC: 0.732** | **AUC: 0.756** | AUC: 0.712 | AUC: 0.983 |
| VADLP | AUC: 0.602 | AUC: 0.625 | AUC: 0.644 | AUC: 0.670 | AUC: 0.633 | AUC: 0.947 |
| CNNLDA | AUC: 0.636 | AUC: 0.601 | AUC: 0.615 | AUC: 0.644 | AUC: 0.623 | AUC: 0.932 |
| GSMV | **AUPR: 0.014** | **AUPR: 0.014** | AUPR: 0.011 | **AUPR: 0.015** | **AUPR: 0.012** | **AUPR: 0.589** |
| GTAN | AUPR: 0.008 | AUPR: 0.012 | AUPR: 0.011 | AUPR: 0.012 | AUPR: 0.009 | AUPR: 0.453 |
| VADLP | AUPR: 0.011 | AUPR: 0.012 | **AUPR: 0.012** | AUPR: 0.008 | AUPR: 0.012 | AUPR: 0.364 |
| CNNLDA | AUPR: 0.008 | AUPR: 0.006 | AUPR: 0.010 | AUPR: 0.009 | AUPR: 0.006 | AUPR: 0.283 |