

Additional File 2

	raw (S_1)			orphan proteins (S_2)			orphan molecules (S_3)			double orphan (S_4)		
	1:1	1:2	1:5	1:1	1:2	1:5	1:1	1:2	1:5	1:1	1:2	1:5
SVM	75.14 ± 1.7	74.95 ± 2.04	74.99 ± 1.76	54.97 ± 4.33	56.5 ± 4.29	56.67 ± 4.44	74.03 ± 3.8	73.89 ± 3.78	74.14 ± 3.72	53.84 ± 8.86	54.46 ± 8.43	53.06 ± 9.63
<i>NRLMF</i>	78.8 ± 3.68	78.88 ± 2.73	78.41 ± 2.69	65.05 ± 7.1	64.96 ± 6.32	65.4 ± 4.9	77.19 ± 1.65	77.21 ± 1.81	77.38 ± 1.81	65.2 ± 7.26	64.59 ± 6.26	63.61 ± 6.51
FNN	75.92 ± 1.17	74.63 ± 1.04	74.88 ± 1.52	58.25 ± 5.34	55.12 ± 4.67	54.88 ± 4.98	74.67 ± 2.38	75.52 ± 2.4	73.96 ± 3.15	56.03 ± 9.22	55.91 ± 8.07	54.68 ± 8.12
chemogenomic neuron network	77.1 ± 1.83	76.5 ± 0.89	76.74 ± 0.85	61.9 ± 4.41	59.64 ± 8.55	64.25 ± 4.0	73.49 ± 3.99	74.04 ± 4.91	74.91 ± 3.98	59.23 ± 9.5	58.4 ± 8.74	58.62 ± 9.1

Table S1 : ROCAUC scores on the *DBEC* dataset in four settings, for a test sample positive:negative ratios in {1:1, 1:2, 1:5}

	raw (S_1)			orphan proteins (S_2)			orphan molecules (S_3)			double orphan (S_4)		
	1:1	1:2	1:5	1:1	1:2	1:5	1:1	1:2	1:5	1:1	1:2	1:5
SVM	81.75 ± 1.75	73.25 ± 2.4	61.55 ± 3.11	59.62 ± 5.55	45.89 ± 6.73	28.95 ± 7.66	80.79 ± 2.37	72.02 ± 3.06	60.96 ± 3.73	58.52 ± 9.21	43.37 ± 9.15	24.4 ± 8.8
<i>NRLMF</i>	82.56 ± 2.82	73.89 ± 2.98	59.89 ± 4.35	67.56 ± 7.04	53.18 ± 8.12	35.62 ± 8.07	81.49 ± 1.48	72.35 ± 2.2	60.06 ± 2.73	67.93 ± 8.63	52.97 ± 8.7	34.5 ± 9.75
FNN	79.82 ± 0.98	68.07 ± 2.35	51.55 ± 2.55	61.92 ± 5.11	42.24 ± 5.27	24.26 ± 3.91	78.57 ± 2.22	68.14 ± 3.43	49.34 ± 3.11	60.04 ± 8.83	43.55 ± 9.84	22.97 ± 6.59
chemogenomic neuron network	79.04 ± 2.24	66.5 ± 2.51	49.08 ± 4.31	60.79 ± 6.24	45.11 ± 8.65	28.38 ± 5.81	76.23 ± 2.23	64.61 ± 4.78	46.14 ± 4.92	61.97 ± 8.72	45.81 ± 8.5	27.0 ± 6.96

Table S2 : AUPR scores on the *DBEC* dataset in four settings, for a test sample positive:negative ratios in {1:1, 1:2, 1:5}

	raw (S_1)			orphan proteins (S_2)			orphan molecules (S_3)			double orphan (S_4)		
	1:1	1:2	1:5	1:1	1:2	1:5	1:1	1:2	1:5	1:1	1:2	1:5
SVM	74.6 ± 0.57	74.6 ± 0.55	74.62 ± 0.54	50.26 ± 3.05	49.88 ± 3.06	49.88 ± 2.95	75.16 ± 1.51	75.28 ± 1.76	75.14 ± 1.69	49.79 ± 1.61	50.25 ± 1.84	50.5 ± 1.68
<i>NRLMF</i>	82.98 ± 0.55	83.06 ± 0.65	83.12 ± 0.63	65.18 ± 1.36	65.18 ± 1.28	65.23 ± 1.2	59.49 ± 0.96	59.56 ± 0.81	59.6 ± 0.93	50.37 ± 1.48	50.29 ± 1.55	50.47 ± 1.35
FNN	90.39 ± 0.42	90.65 ± 0.46	90.45 ± 0.52	74.74 ± 0.54	74.08 ± 2.29	74.25 ± 1.96	83.06 ± 1.48	83.52 ± 1.52	82.9 ± 1.8	69.12 ± 2.3	69.17 ± 1.99	68.79 ± 1.69
chemogenomic neuron network	88.67 ± 1.59	88.21 ± 1.47	88.21 ± 2.23	81.5 ± 1.47	80.83 ± 2.7	80.28 ± 1.4	85.76 ± 1.5	85.4 ± 2.02	85.76 ± 2.23	73.34 ± 5.89	71.21 ± 5.53	73.68 ± 4.87

Table S3 : ROCAUC scores on the *DBH* dataset in four settings, for a test sample positive:negative ratios in {1:1, 1:2, 1:5}

	raw (S_1)			orphan proteins (S_2)			orphan molecules (S_3)			double orphan (S_4)		
	1:1	1:2	1:5	1:1	1:2	1:5	1:1	1:2	1:5	1:1	1:2	1:5
SVM	78.34 ± 0.44	66.85 ± 0.68	48.99 ± 0.5	50.35 ± 2.64	33.46 ± 2.33	16.82 ± 1.54	78.2 ± 1.77	66.86 ± 2.12	48.66 ± 2.74	49.84 ± 1.7	33.26 ± 1.64	16.81 ± 1.02
<i>NRLMF</i>	86.14 ± 0.45	78.73 ± 0.75	66.93 ± 1.06	68.19 ± 1.55	53.68 ± 1.72	34.75 ± 1.65	61.88 ± 0.99	45.93 ± 0.72	26.42 ± 0.52	50.45 ± 1.31	33.71 ± 1.25	16.99 ± 0.8
FNN	91.45 ± 0.45	86.5 ± 0.44	75.91 ± 0.49	78.16 ± 0.44	66.02 ± 1.86	49.13 ± 2.58	85.69 ± 1.05	78.15 ± 1.18	64.06 ± 1.6	71.46 ± 2.02	57.93 ± 2.7	38.61 ± 2.29
chemogenomic neuron network	88.74 ± 1.68	80.29 ± 2.65	65.46 ± 4.53	81.82 ± 1.9	70.39 ± 3.66	47.68 ± 4.38	86.0 ± 1.85	77.02 ± 3.41	62.22 ± 4.66	72.26 ± 6.42	55.98 ± 7.67	38.48 ± 7.5

Table S4 : AUPR scores on the *DBH* dataset in four settings, for a test sample positive:negative ratios in {1:1, 1:2, 1:5}