

Table S1: ROC scores of DEGnext and ML methods for general learning on bio-test data (T3) for all 17 datasets

Dataset	Method	accuracy	recall	precision	F-measure	MCC	ROC-scores
BLCA	DEGnext	98.42	98.42	98.49	0.98	0.97	0.99
	DTC	84.65	84.65	86.08	0.85	0.69	0.88
	KNN	90.18	90.18	90.21	0.9	0.79	0.94
	RFC	90.58	90.58	90.77	0.91	0.8	0.96
	SVC	85.08	85.08	86.25	0.85	0.69	0.94
	XGBoost	92.93	92.93	93.09	0.93	0.85	0.99
BRCA	DEGnext	98.8	98.8	98.83	0.99	0.98	0.99
	DTC	76.54	76.54	77.75	0.76	0.52	0.83
	KNN	89.77	89.77	89.84	0.9	0.79	0.96
	RFC	94.93	94.93	94.96	0.95	0.9	0.98
	SVC	82.81	82.81	86.68	0.82	0.67	0.99
	XGBoost	96.52	96.52	96.55	0.97	0.93	0.99
CHOL	DEGnext	100	100	100	1	1	0.99
	DTC	91.47	91.47	91.4	0.91	0.71	0.83
	KNN	99.28	99.28	99.29	0.99	0.98	0.99
	RFC	98.55	98.55	98.57	0.99	0.95	0.99
	SVC	90.76	90.76	91.77	0.9	0.69	0.99
	XGBoost	98.36	98.36	98.38	0.98	0.95	0.99
COAD	DEGnext	99.64	99.64	99.65	1	0.99	0.99
	DTC	75.12	75.12	76.58	0.75	0.51	0.81
	KNN	95.78	95.78	95.83	0.96	0.91	0.99
	RFC	96.35	96.35	96.39	0.96	0.93	0.99
	SVC	92.5	92.5	93.67	0.92	0.86	0.99
	XGBoost	97.93	97.93	97.94	0.98	0.96	0.99
ESCA	DEGnext	97.95	97.95	98.1	0.98	0.96	0.99
	DTC	77.08	77.08	80.64	0.76	0.5	0.79
	KNN	92.22	92.22	92.53	0.92	0.82	0.95
	RFC	91.2	91.2	91.54	0.91	0.8	0.96
	SVC	76.73	76.73	82.93	0.71	0.44	0.94
	XGBoost	93.76	93.76	94.31	0.94	0.86	0.97
HNSC	DEGnext	99.32	99.32	99.34	0.99	0.98	0.99
	DTC	78.88	78.88	79.09	0.79	0.51	0.77
	KNN	89.5	89.5	89.73	0.89	0.75	0.95
	RFC	94.28	94.28	94.44	0.94	0.87	0.98
	SVC	75.88	75.88	82.22	0.7	0.41	0.97
	XGBoost	95.23	95.23	95.34	0.95	0.89	0.99
KICH	DEGnext	100	100	100	1	1	0.99
	DTC	83.39	83.39	84.81	0.82	0.6	0.82
	KNN	96.69	96.69	96.76	0.97	0.92	0.97
	RFC	94.77	94.77	95.23	0.95	0.88	0.99
	SVC	90.17	90.17	91.15	0.9	0.77	0.99
	XGBoost	95.12	95.12	95.2	0.95	0.89	0.99
KIRC	DEGnext	99.78	99.78	99.78	1	1	0.99
	DTC	74.51	74.51	75.07	0.74	0.49	0.77
	KNN	87.47	87.47	88.19	0.87	0.75	0.95
	RFC	92.75	92.75	92.98	0.93	0.86	0.97
	SVC	71.65	71.65	79.41	0.68	0.48	0.95
	XGBoost	92.75	92.75	92.85	0.93	0.85	0.98
KIRP	DEGnext	100	100	100	1	1	0.99
	DTC	74.77	74.77	75.81	0.74	0.48	0.76
	KNN	88.15	88.15	89.91	0.88	0.77	0.96
	RFC	91.43	91.43	92.1	0.91	0.83	0.98
	SVC	80.34	80.34	85.33	0.79	0.63	0.95
	XGBoost	92.87	92.87	93.33	0.93	0.86	0.98
LIHC	DEGnext	95.93	95.93	96.23	0.96	0.85	0.96
	DTC	89.18	89.18	88.92	0.87	0.46	0.76
	KNN	93.99	93.99	94.03	0.93	0.73	0.93
	RFC	96.66	96.66	96.65	0.97	0.85	0.98
	SVC	88.85	88.85	90.19	0.85	0.41	0.97

*Continue on the next page*

Table S1: ROC scores of DEGnext and ML methods for general learning on bio-test data (T3) for all 17 datasets (cont.).

Dataset	Method	accuracy	recall	precision	F-measure	MCC	ROC-scores
	XGBoost	96.46	96.46	96.44	0.96	0.84	0.99
LUAD	DEGnext	99.82	99.82	99.83	1	1	0.99
	DTC	79.68	79.68	80.18	0.8	0.54	0.82
	KNN	89.26	89.26	89.4	0.89	0.75	0.94
	RFC	93.63	93.63	93.62	0.94	0.85	0.97
	SVC	82.54	82.54	86.32	0.8	0.61	0.98
	XGBoost	95.06	95.06	95.22	0.95	0.89	0.98
LUSC	DEGnext	99.88	99.88	99.88	1	1	0.99
	DTC	78.66	78.66	80.63	0.79	0.58	0.83
	KNN	94.16	94.16	94.47	0.94	0.88	0.98
	RFC	96.31	96.31	96.4	0.96	0.92	0.99
	SVC	90.47	90.47	92.2	0.9	0.81	0.99
	XGBoost	97.85	97.85	97.9	0.98	0.96	0.99
PRAD	DEGnext	99.35	99.35	99.36	0.99	0.99	0.99
	DTC	77.78	77.78	79.42	0.77	0.56	0.84
	KNN	93.7	93.7	93.79	0.94	0.87	0.98
	RFC	94.35	94.35	94.42	0.94	0.89	0.98
	SVC	84.81	84.81	86.87	0.85	0.72	0.96
	XGBoost	95.28	95.28	95.36	0.95	0.91	0.99
READ	DEGnext	95.39	95.39	96.54	0.95	0.92	0.99
	DTC	88.65	88.65	89.12	0.89	0.78	0.89
	KNN	88.8	88.8	89.35	0.89	0.78	0.95
	RFC	88	88	89.52	0.88	0.78	0.96
	SVC	79.54	79.54	83.54	0.79	0.63	0.93
	XGBoost	92	92	92.57	0.92	0.84	0.98
STAD	DEGnext	96.89	96.89	97.06	0.97	0.93	0.99
	DTC	78.35	78.35	78.23	0.77	0.48	0.76
	KNN	88.93	88.93	90.19	0.88	0.75	0.96
	RFC	89.69	89.69	89.72	0.9	0.76	0.95
	SVC	71.15	71.15	77.64	0.62	0.27	0.97
	XGBoost	93.81	93.81	94.06	0.94	0.86	0.98
THCA	DEGnext	99.87	99.87	99.87	1	1	0.99
	DTC	76.24	76.24	76.45	0.75	0.46	0.74
	KNN	92.41	92.41	92.8	0.92	0.83	0.96
	RFC	96.37	96.37	96.43	0.96	0.92	0.99
	SVC	86.54	86.54	88.5	0.86	0.71	0.98
	XGBoost	97.89	97.89	97.91	0.98	0.95	0.99
UCEC	DEGnext	99.6	99.6	99.61	1	0.99	0.99
	DTC	78.08	78.08	78.4	0.78	0.56	0.82
	KNN	90.59	90.59	91.15	0.91	0.82	0.97
	RFC	95.6	95.6	95.68	0.96	0.91	0.99
	SVC	85.59	85.59	87.58	0.86	0.73	0.97
	XGBoost	97.3	97.3	97.33	0.97	0.95	0.99

Table S2: ROC scores of DEGnext and ML methods for transfer learning on 100% of bio data (Q) for 8 testing datasets, namely BLCA, CHOL, COAD, ESCA, HNSC, KICH, READ, and STAD

Dataset	Method	accuracy	recall	precision	F-measure	MCC	ROC-scores
BLCA	DEGnext	95.69	95.69	95.76	0.96	0.91	0.95
	DTC	88.58	88.58	89.03	0.88	0.76	0.96
	KNN	91.34	91.34	91.35	0.91	0.82	0.98
	RFC	99.61	99.61	99.61	1	0.99	1
	SVC	90.94	90.94	91.08	0.91	0.81	0.98
	XGBoost	99.21	99.21	99.22	0.99	0.98	1
CHOL	DEGnext	98.26	98.26	98.49	0.98	0.94	0.99
	DTC	94.2	94.2	94.13	0.94	0.81	0.88
	KNN	99.82	99.82	99.82	1	0.99	1
	RFC	99.82	99.82	99.82	1	0.99	1
	SVC	91.3	91.3	92.16	0.9	0.71	1
	XGBoost	100	100	100	1	1	1
COAD	DEGnext	84.21	84.21	88.44	0.84	0.72	0.86
	DTC	78.98	78.98	80.57	0.79	0.59	0.84
	KNN	97.64	97.64	97.65	0.98	0.95	1
	RFC	99.36	99.36	99.36	0.99	0.99	1
	SVC	96.35	96.35	96.57	0.96	0.93	1
	XGBoost	99.79	99.79	99.79	1	1	1
ESCA	DEGnext	92.97	92.97	94.68	0.93	0.61	0.93
	DTC	91.71	91.71	92.62	0.91	0.82	0.93
	KNN	94.82	94.82	94.89	0.95	0.88	0.99
	RFC	99.48	99.48	99.49	0.99	0.99	1
	SVC	91.19	91.19	91.89	0.91	0.8	0.99
	XGBoost	99.48	99.48	99.49	0.99	0.99	1
HNSC	DEGnext	98.44	98.44	98.49	0.98	0.96	0.98
	DTC	82.43	82.43	83.5	0.83	0.61	0.84
	KNN	92.37	92.37	92.33	0.92	0.82	0.98
	RFC	99.46	99.46	99.46	0.99	0.99	1
	SVC	76.57	76.57	82.53	0.71	0.43	0.99
	XGBoost	99.46	99.46	99.46	0.99	0.99	1
KICH	DEGnext	98.75	98.75	98.79	0.99	0.97	0.98
	DTC	88.24	88.24	88.33	0.88	0.72	0.87
	KNN	98.37	98.37	98.37	0.98	0.96	1
	RFC	99.67	99.67	99.68	1	0.99	1
	SVC	92.81	92.81	93.49	0.93	0.83	0.99
	XGBoost	99.67	99.67	99.68	1	0.99	1
READ	DEGnext	86.05	86.05	89.23	0.86	0.75	0.87
	DTC	95.87	95.87	95.97	0.96	0.92	0.96
	KNN	95.04	95.04	95.04	0.95	0.9	0.99
	RFC	99.17	99.17	99.19	0.99	0.98	1
	SVC	76.03	76.03	80.71	0.75	0.57	0.95
	XGBoost	100	100	100	1	1	1
STAD	DEGnext	97.77	97.77	97.89	0.98	0.95	0.96
	DTC	85.31	85.31	85.21	0.85	0.65	0.83
	KNN	92.78	92.78	93.34	0.93	0.84	0.99
	RFC	98.45	98.45	98.45	0.98	0.96	1
	SVC	82.22	82.22	85.92	0.8	0.6	0.99
	XGBoost	99.74	99.74	99.74	1	0.99	1