

Supplemental Table 1. Performance metrics for three models in distinguishing OA vs. RA

	Model 1: Pathologist-Scored Features	Model 2: Cell Density Alone	Model 3: Pathology-Scored Features + Cell Density
Micro-AUC ($\pm$ SD)	0.85 $\pm$ 0.06	0.87	0.92 $\pm$ 0.06
Macro-AUC	0.85	0.88	0.91
Micro-Precision ($\pm$ SD)	0.82 $\pm$ 0.10	0.91 $\pm$ 0.14	0.93 $\pm$ 0.08
Macro-Precision	0.89	0.89	0.92
Micro-Recall ($\pm$ SD)	0.86 $\pm$ 0.11	0.84 $\pm$ 0.10	0.81 $\pm$ 0.09
Macro-Recall	0.8	0.84	0.9
Micro-F1 score ($\pm$ SD)	0.84 $\pm$ 0.10	0.87 $\pm$ 0.05	0.87 $\pm$ 0.06
Macro-F1 score	0.83	0.86	0.91
Out-of-bag-error ($\pm$ SD)	0.12 $\pm$ 0.01	---	0.09 $\pm$ 0.02

AUC = area under the receiver operating curve