



**Figure 8—figure supplement 1. MRI-molecule connections.**

(A) Diagram showing the stacks of MRI per disc level and the 11 locations per disc. (B) Dashed curves overlaying the young discs' 3T MRI images, showing the compartments taken for proteomic profiling. (C) A heatmap with compartment and level bi-clustering, showing the relationship between regional MRI intensities. (D) Stacks of MRI images of the aged sample. (E) Scatter-plot showing the actual original MRI intensities of the young discs, and their predicted intensities of an LASSO model trained based on the ECM proteins most correlated with the aged disc MRI intensities. (F) A receiver operating characteristic (ROC) curve of the predicted MRI intensities between inner disc regions and