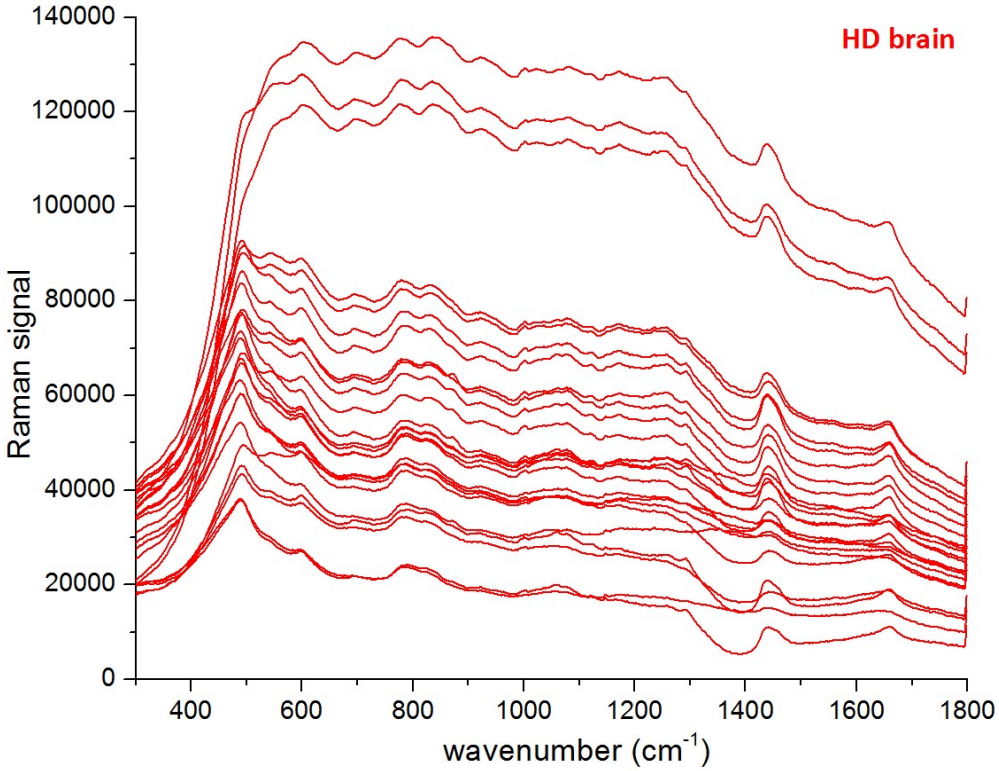
Electronic Supplementary Material (ESI) for Analytical Methods.

Supplementary material



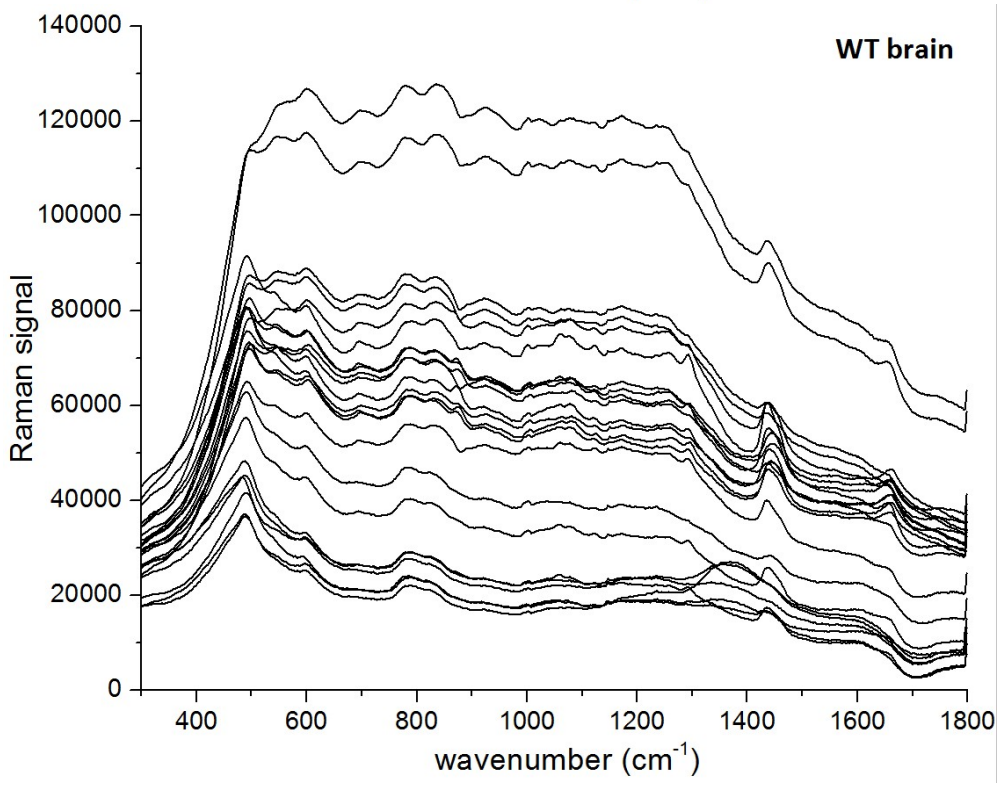


Fig S1. Unprocessed Raman spectra acquired on minipig brain tissue for wild type (WT) and a Huntington's disease model (HD). Individual spectra were acquired on different samples from different animals, or on different regions of the sample.

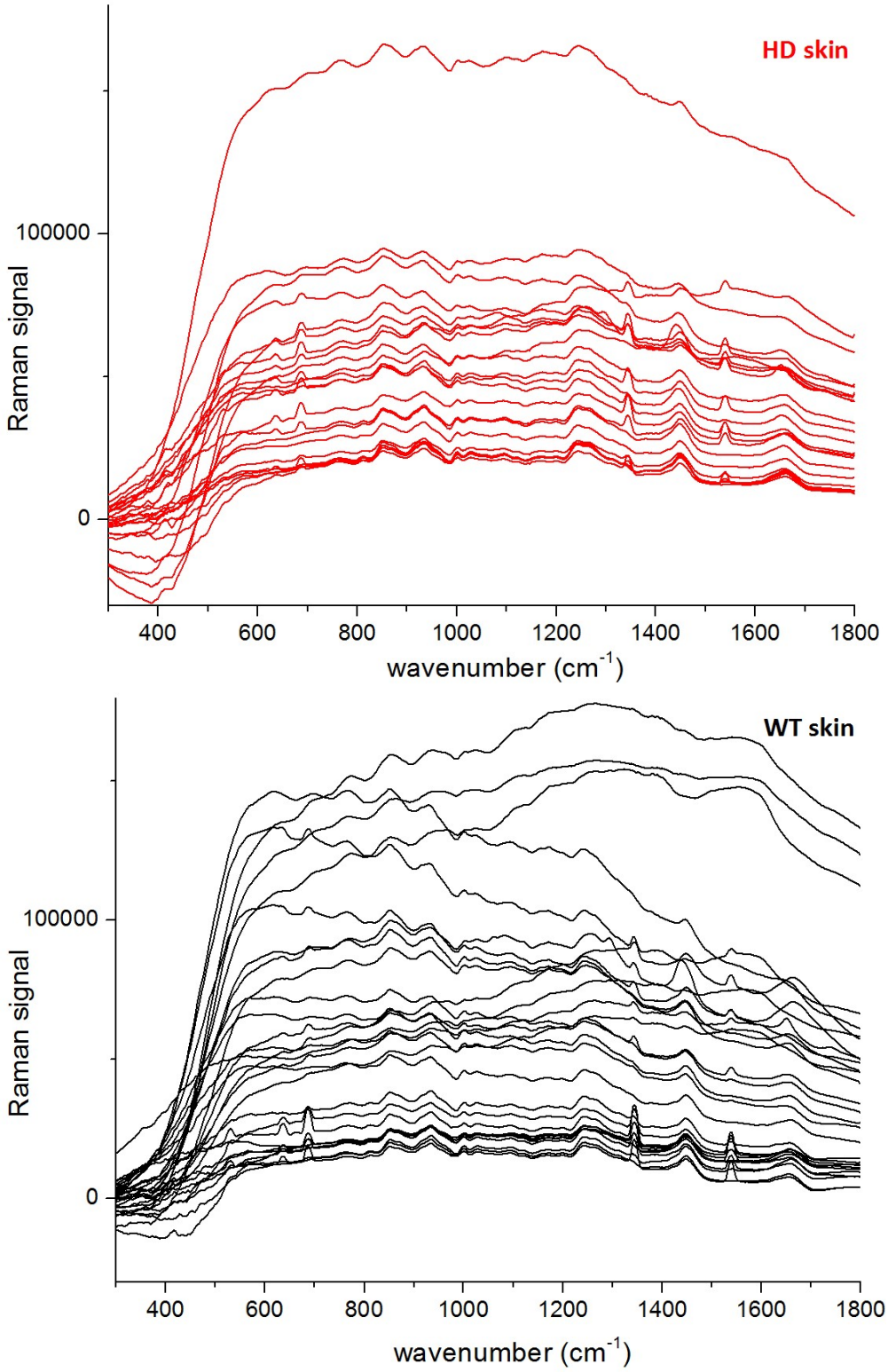
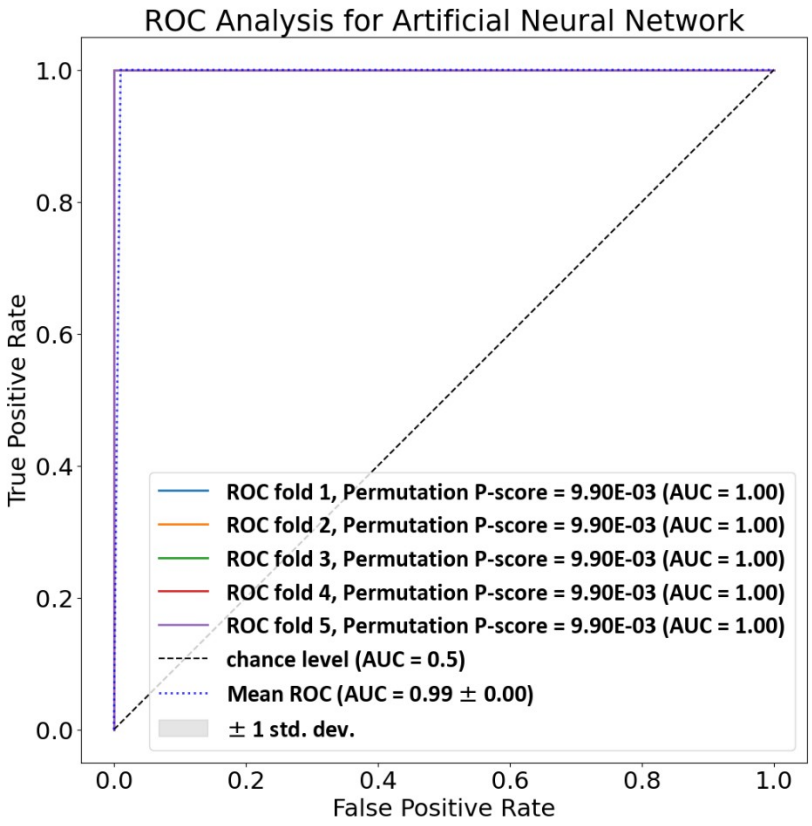


Fig S2. Unprocessed Raman spectra acquired on minipig skin tissue for wild type (WT) and a Huntington's disease model (HD). Individual spectra were acquired on different samples from different animals, or on different regions of the sample.


ROC Analysis for Artificial Neural Network
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
ROC fold 1, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 2, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 3, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 4, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 5, Permutation P-score = 9.90E-03 (AUC = 1.00)
chance level (AUC = 0.5)
Mean ROC (AUC = 0.99 ± 0.00)
± 1 std. dev.

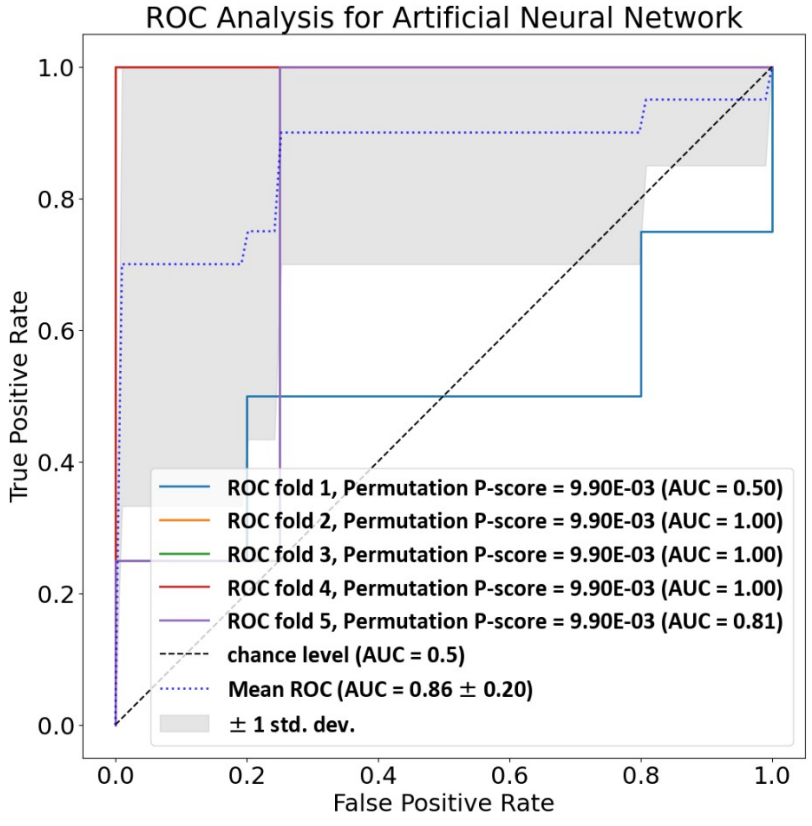
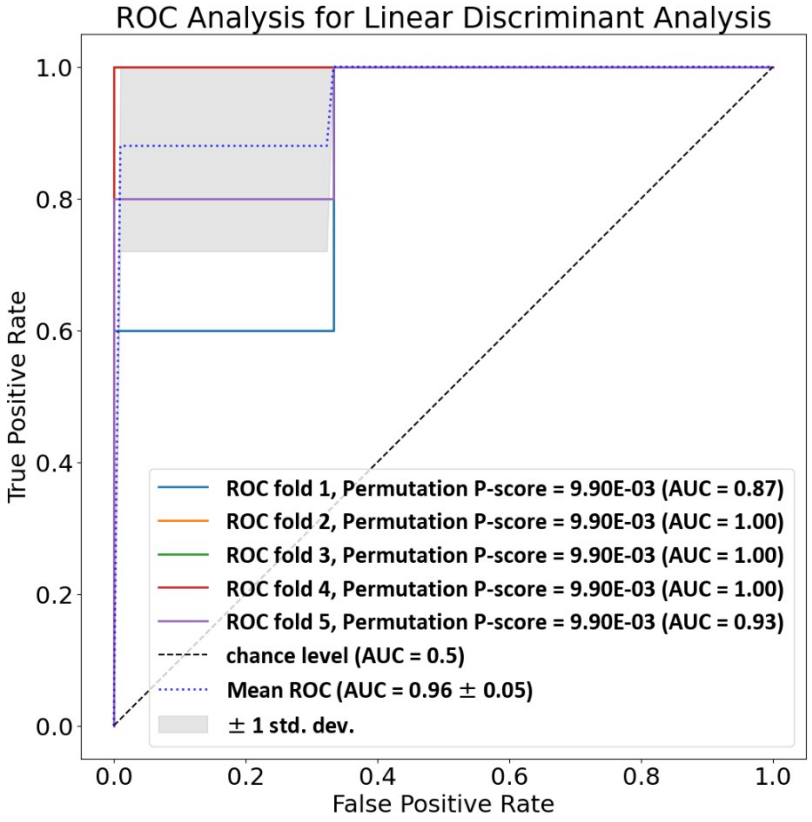

ROC Analysis for Artificial Neural Network
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
ROC fold 1, Permutation P-score = 9.90E-03 (AUC = 0.50)
ROC fold 2, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 3, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 4, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 5, Permutation P-score = 9.90E-03 (AUC = 0.81)
chance level (AUC = 0.5)
Mean ROC (AUC = 0.86 ± 0.20)
± 1 std. dev.

Fig S3. Top: ROC plot for brain tissue using artificial neural networks (ANN) as the method of classification, with a mean area under curve of 0.99, indicating a predictive accuracy of 99%. Bottom: ROC plot for skin tissue using ANN as the method of classification, with a mean area under curve of 0.86, indicating a predictive accuracy of 86%.



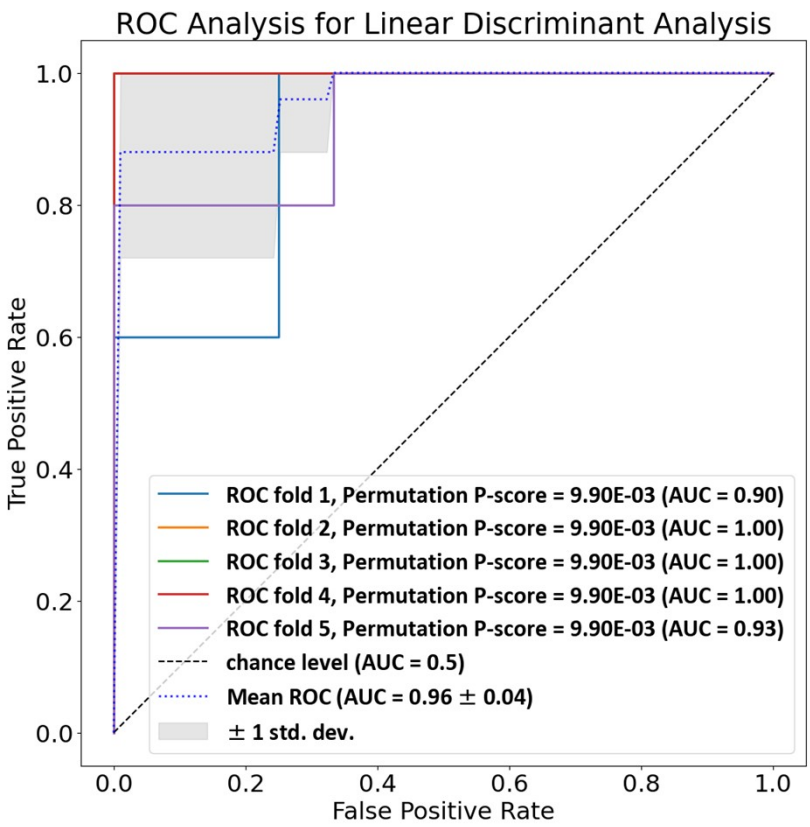
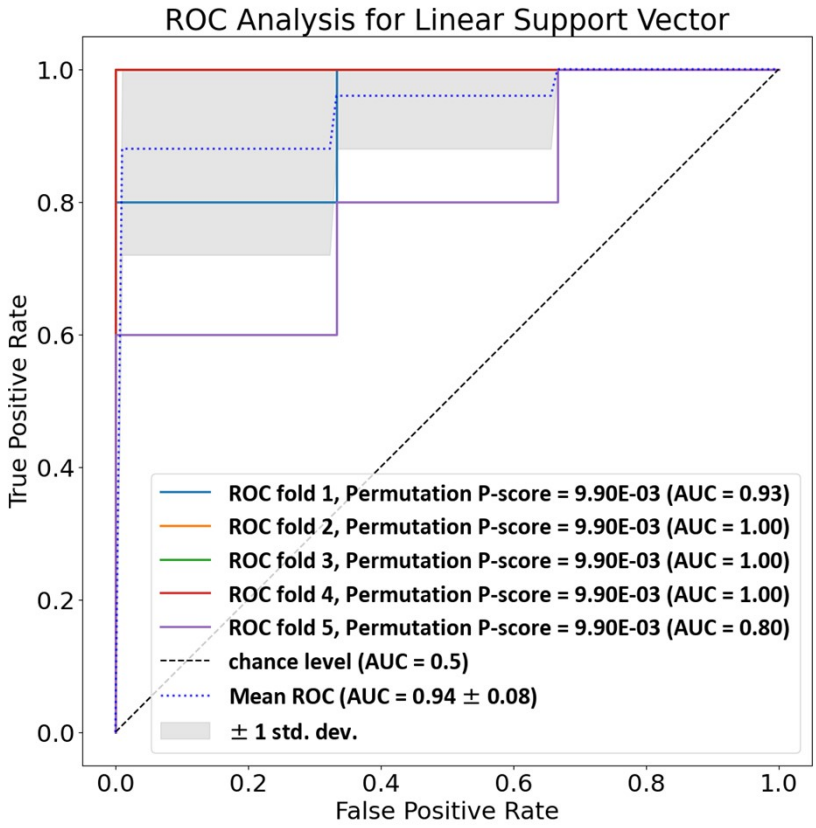


Fig S4. Top: ROC plot for brain tissue using linear discriminant analysis (LDA) as the method of classification, with a mean area under curve of 0.96, indicating a predictive accuracy of 96%. Bottom: ROC plot for skin tissue using LDA as the method of classification, also with a mean area under curve of 0.96, indicating a predictive accuracy of 96%.


ROC Analysis for Linear Support Vector
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
ROC fold 1, Permutation P-score = 9.90E-03 (AUC = 0.93)
ROC fold 2, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 3, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 4, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 5, Permutation P-score = 9.90E-03 (AUC = 0.80)
chance level (AUC = 0.5)
Mean ROC (AUC = 0.94 ± 0.08)
± 1 std. dev.

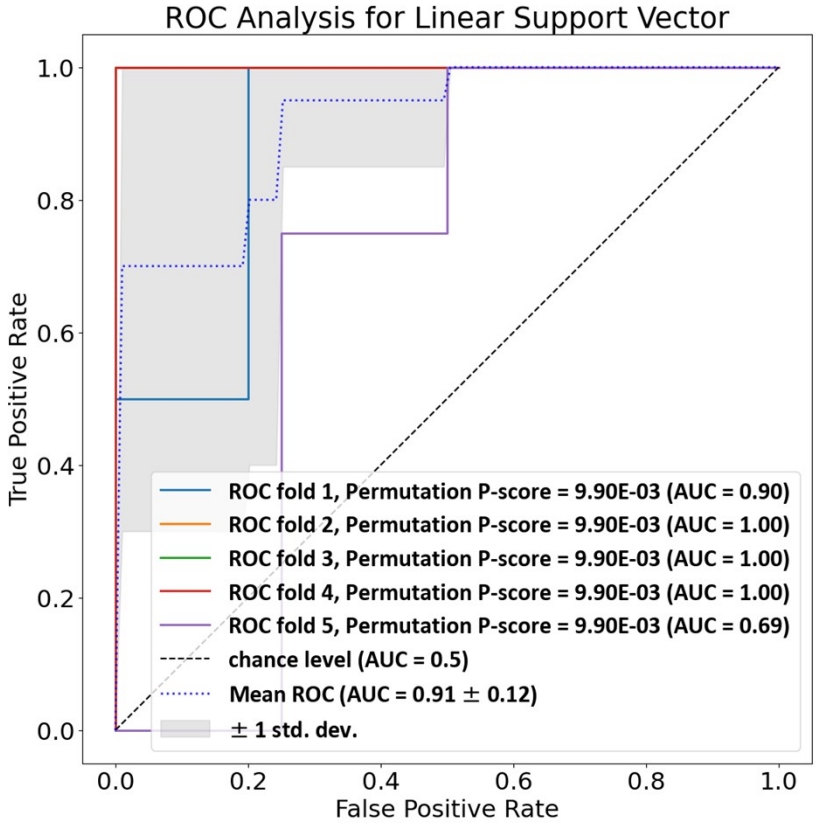
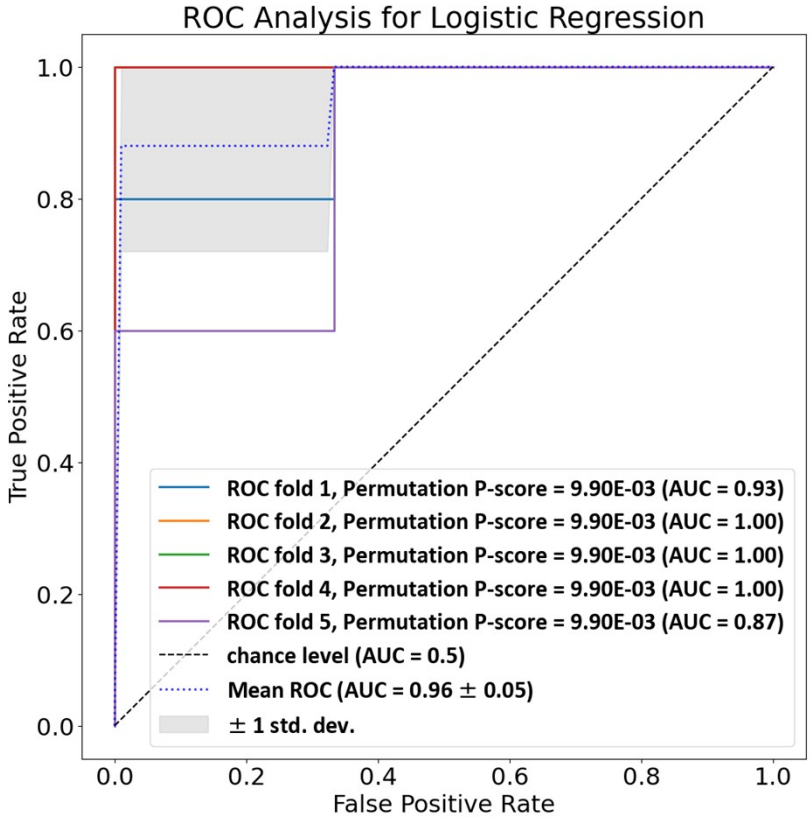

ROC Analysis for Linear Support Vector
True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
ROC fold 1, Permutation P-score = 9.90E-03 (AUC = 0.90)
ROC fold 2, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 3, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 4, Permutation P-score = 9.90E-03 (AUC = 1.00)
ROC fold 5, Permutation P-score = 9.90E-03 (AUC = 0.69)
chance level (AUC = 0.5)
Mean ROC (AUC = 0.91 ± 0.12)
± 1 std. dev.

Fig S5. Top: ROC plot for brain tissue using linear support vector classification (linear SVC) as the method of classification, with a mean area under curve of 0.94, indicating a predictive accuracy of 94%. Bottom: ROC plot for skin tissue using linear SVC as the method of classification, with a mean area under curve of 0.91, indicating a predictive accuracy of 91%.



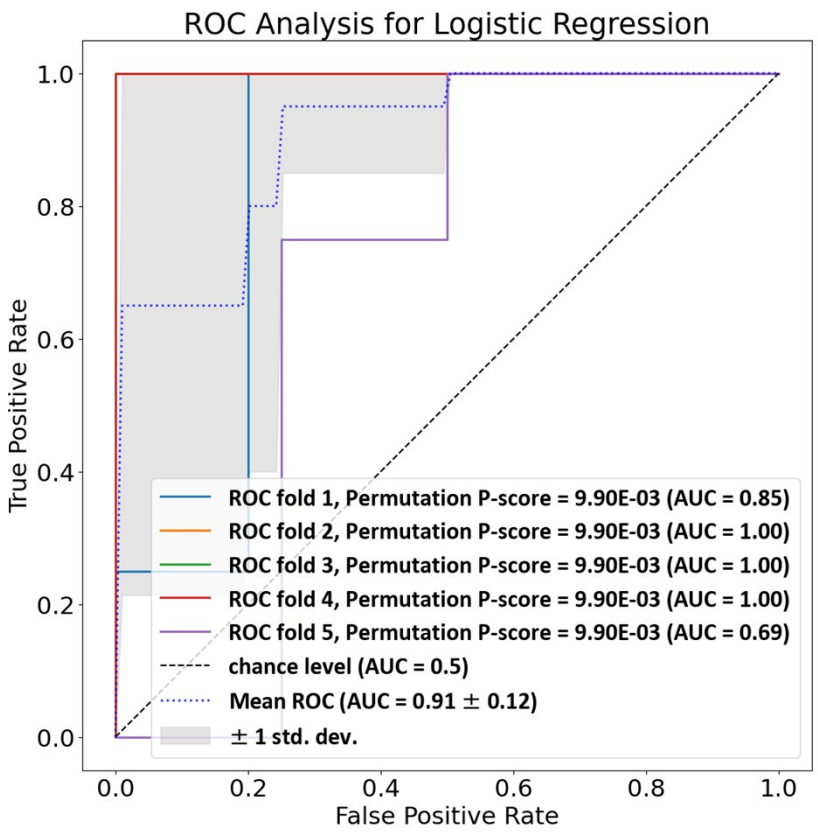


Fig S6. Top: ROC plot for brain tissue using Logistic regression (LR) as the method of classification, with a mean area under curve of 0.96, indicating a predictive accuracy of 96%. Bottom: ROC plot for skin tissue using LR as the method of classification, with a mean area under curve of 0.91, indicating a predictive accuracy of 91%.