

Supplementary Table 1. Clustered Feature Lists of TumorPrism3D and 3D Slicer

TumorPrism3D				3D Slicer			
Rater 1		Rater 2		Rater 1		Rater 2	
Cluster No.	Feature Name	Cluster No.	Feature Name	Cluster No.	Feature Name	Cluster No.	Feature Name
1	Area_CE	1	Area_CE	1	Proportion_CE	1	Volume_CE
1	Longestaxis_CE	1	Longestaxis_CE	1	Area_CE	1	Proportion_CE
1	Proportion_CE	1	Area_NH	1	Longestaxis_NH	1	Longestaxis_CE
1	Spherical.disproportion_NC	1	Longestaxis_NH			1	Area_CE
1	Surface.to.volume.ratio_CE	1	Surface.area_NH	2	Slope_NC		
1	Spherical.disproportion_CE	1	Skewness_CE	2	Slope_CE	2	Energy_CE
1	Surface.to.volume.ratio_NC	1	Longestaxis_NC	2	Edgesharpness_CE	2	Slope_CE
1	Area_NH	1	Volume_CE	2	Energy_CE	2	Maximum_CE
1	Longestaxis_NH			2	Maximum_CE	2	Mean_CE
1	Surface.area_NH	2	Slope_CE	2	Mean_CE	2	Mean.absolute.deviation_CE
		2	Energy_CE	2	Mean.absolute.deviation_CE	2	Median_CE
2	Maximum_CE	2	Maximum_CE	2	Median_CE	2	Minimum_CE
2	Slope_CE	2	Mean_CE	2	Minimum_CE	2	Range_CE
2	Mean_CE	2	Mean.absolute.deviation_CE	2	Range_CE	2	RMS_CE
2	Mean.absolute.deviation_CE	2	Median_CE	2	RMS_CE	2	Standard.deviation_CE
2	Median_CE	2	Minimum_CE	2	Standard.deviation_CE	2	Variance_CE
2	Minimum_CE	2	Range_CE	2	Variance_CE	2	Slope_NC
2	Range_CE	2	RMS_CE	2	Maximum_NC	2	Maximum_NC
2	RMS_CE	2	Standard.deviation_CE	2	Mean_NC	2	Mean_NC
2	Standard.deviation_CE	2	Variance_CE	2	Mean.absolute.deviation_NC	2	Mean.absolute.deviation_NC
2	Variance_CE	2	Slope_NC	2	Median_NC	2	Median_NC
2	Maximum_NC	2	Energy_NC	2	Minimum_NC	2	Minimum_NC
2	Mean_NC	2	Maximum_NC	2	RMS_NC	2	RMS_NC
2	Mean.absolute.deviation_NC	2	Mean_NC	2	Standard.deviation_NC	2	Variance_NC
2	Median_NC	2	Mean.absolute.deviation_NC	2	Variance_NC	2	Auto.correlation_CE
2	Minimum_NC	2	Median_NC	2	Auto.correlation_CE	2	Sum.average_CE
2	Range_NC	2	Minimum_NC	2	Cluster.prominence_CE	2	Sum.variance_CE
2	RMS_NC	2	Range_NC	2	Sum.average_CE	2	Variance_CE_T
2	Standard.deviation_NC	2	RMS_NC	2	Sum.variance_CE	2	LRE_CE
2	Variance_NC	2	Standard.deviation_NC	2	Variance_CE_T	2	LRLGLE_CE
2	Auto.correlation_CE	2	Variance_NC	2	LRE_CE	2	Auto.correlation_NC
2	Cluster.prominence_CE	2	Auto.correlation_CE	2	LRLGLE_CE	2	Cluster.prominence_NC
2	Sum.average_CE	2	Cluster.prominence_CE	2	LRHGLE_CE	2	Cluster.shade_NC
2	Sum.variance_CE	2	Cluster.tendency_CE	2	Auto.correlation_NC	2	Cluster.tendency_NC
2	Variance_CE_T	2	Contrast_CE	2	Cluster.prominence_NC	2	Sum.average_NC
2	LRE_CE	2	Sum.average_CE	2	Cluster.shade_NC	2	Sum.variance_NC
2	LRLGLE_CE	2	Sum.variance_CE	2	Cluster.tendency_NC	2	Variance_NC_T
2	LRHGLE_CE	2	Variance_CE_T	2	Contrast_NC	2	LRE_NC
2	Auto.correlation_NC	2	LRE_CE	2	Sum.average_NC	2	LRLGLE_NC
2	Cluster.prominence_CE	2	LRLGLE_CE	2	Sum.variance_NC	2	LRHGLE_NC
2	Cluster.shade_NC	2	LRHGLE_CE	2	Variance_NC_T	2	Standard.deviation_NC
2	Cluster.tendency_NC	2	Auto.correlation_NC	2	LRE_NC	2	Range_NC
2	Contrast_NC	2	Cluster.prominence_CE	2	LRLGLE_NC	2	Contrast_NC
2	Sum.average_NC	2	Cluster.shade_NC	2	LRHGLE_NC	2	Energy_NC
2	Sum.variance_NC	2	Cluster.tendency_NC	2	Range_NC	2	Edgesharpness_NC
2	Variance_NC_T	2	Contrast_NC	2	Edgesharpness_NC	2	Edgesharpness_CE
2	LRE_NC	2	Dissimilarity_NC	2	Dissimilarity_NC	2	Dissimilarity_NC
2	LRLGLE_NC	2	Sum.average_NC	2	Energy_NC		
2	LRHGLE_NC	2	Sum.variance_NC			3	Maximum.3D.diameter_NC
2	Contrast_CE	2	Variance_NC_T	3	Volume_CE	3	Entropy_NC
2	Cluster.tendency_CE	2	LRE_NC	3	Compactness1_CE	3	Surface.area_NC
2	Energy_NC	2	LRLGLE_NC	3	Dissimilarity_CE	3	Volume_NC
2	Energy_CE	2	LRHGLE_NC	3	Difference.entropy_CE	3	Maximum.3D.diameter_NH
2	Dissimilarity_NC	2	Surface.area_CE	3	Surface.to.volume.ratio_NC	3	Difference.entropy_CE
		2	Dissimilarity_CE	3	Spherical.disproportion_NC	3	Dissimilarity_CE
3	Volume_CE			3	IMC2_CE	3	Entropy_CE_T
3	Compactness1_CE	3	Edgesharpness_CE	3	Difference.entropy_NC	3	IMC2_CE
3	Compactness1_NH	3	Compactness1_CE	3	Entropy_NC_T	3	GLN_CE
3	Sphericity_NC	3	Maximum.3D.diameter_CE	3	IMC2_NC	3	RP_CE
3	Compactness2_NC	3	Area_NC	3	Sum.entropy_NC	3	LGLRE_CE
3	RP_NC	3	Edgesharpness_NC	3	GLN_NC	3	Homogeneity1_NC
3	Skewness_NC	3	Proportion_NC	3	RP_NC	3	Homogeneity2_NC
3	Entropy_NC	3	Entropy_NC	3	Sum.entropy_CE	3	IDMN_NC
3	Uniformity_NC	3	Kurtosis_NC	3	Entropy_CE_T	3	HGLRE_NC
3	Compactness1_NC	3	Skewness_NC	3	LGLRE_CE	3	Area_NC
3	Maximum.3D.diameter_NC	3	Uniformity_NC	3	GLN_CE	3	Longestaxis_NC
3	Maximum.3D.diameter_NH	3	Compactness1_NC	3	Entropy_NC	3	Proportion_NC
3	Volume_NH	3	Compactness2_NC	3	RP_CE	3	Cluster.tendency_CE
3	Difference.entropy_CE	3	Maximum.3D.diameter_NC	3	Inverse.variance_NC	3	Sum.entropy_CE
3	Entropy_CE_T	3	Sphericity_NC	3	LGLRE_NC	3	IDN_NC
3	IMC2_CE	3	Surface.area_NC	3	Correlation_NC	3	RLN_NC
3	Sum.entropy_CE	3	Volume_NC	3	Correlation_CE	3	Energy_NC_T
3	GLN_CE	3	Edgesharpness_NH	3	Cluster.tendency_CE	3	Kurtosis_NC
3	RP_CE	3	Compactness1_NH	3	Contrast_CE	3	Maximum.Probability_NC
3	LGLRE_CE	3	Maximum.3D.diameter_NH	3	IDN_NC	3	Contrast_CE
3	Correlation_NC	3	Entropy_CE	3	IDMN_NC	3	Cluster.prominence_CE
3	Homogeneity2_NC	3	Proportion_NH	3	Maximum.3D.diameter_NH	3	Volume_NH
3	IDMN_NC	3	Volume_NH	3	Area_NC	3	Compactness1_NH
3	IDN_NC	3	Correlation_CE	3	Maximum.3D.diameter_CE	3	Inverse.variance_NC
3	Inverse.variance_NC	3	Difference.entropy_CE	3	Proportion_NC	3	Entropy_NC_T
3	LGLRE_NC	3	Entropy_CE_T	3	Kurtosis_NC	3	GLN_NC
3	HGLRE_NC	3	IMC2_CE	3	Skewness_NC	3	Difference.entropy_NC
3	Area_NC	3	IDMN_CE	3	Uniformity_NC	3	Correlation_NC
3	Maximum.3D.diameter_CE	3	IDN_CE	3	Maximum.3D.diameter_NC	3	IMC2_NC
3	Longestaxis_NC	3	Sum.entropy_CE	3	Volume_NC	3	Sum.entropy_NC
3	Proportion_NC	3	GLN_CE	3	Energy_NC_T	3	RP_NC
3	Kurtosis_NC	3	RP_CE	3	Homogeneity1_NC	3	LGLRE_NC
3	Volume_NC	3	LGLRE_CE	3	Homogeneity2_NC	3	Skewness_NC
3	Energy_NC_T	3	Correlation_NC	3	Maximum.Probability_NC	3	Correlation_CE
3	Homogeneity1_NC	3	Difference.entropy_NC	3	RLN_NC	3	Proportion_NH
3	Maximum.Probability_NC	3	Energy_NC_T	3	HGLRE_NC	3	Entropy_CE
3	RLN_NC	3	Entropy_NC_T	3	Longestaxis_NC		

Supplementary Table 1. Clustered Feature Lists of TumorPrism3D and 3D Slicer (Continued)

TumorPrism3D				3D Slicer			
Rater 1		Rater 2		Rater 1		Rater 2	
Cluster No.	Feature Name	Cluster No.	Feature Name	Cluster No.	Feature Name	Cluster No.	Feature Name
3	Difference.entropy_NC	3	Homogeneity1_NC	3	Volume_NH	4	Proportion_NH
3	Slope_NC	3	Homogeneity2_NC	3	Compactness1_NH	4	Compactness2_NC
3	Entropy_NC_T	3	IMC2_NC	3	Surface.area_NC	4	Compactness1_NC
3	IMC2_NC	3	IDMN_NC	3	Surface.area_CE	4	Sphericity_NC
3	Sum.entropy_NC	3	IDN_NC	3	Longestaxis_CE	4	Uniformity_NC
3	GLN_NC	3	Inverse.variance_NC			4	Compactness1_CE
3	Correlation_CE	3	Maximum.Probability_NC	4	Sphericity_NC	4	Uniformity_CE
3	Dissimilarity_CE	3	Sum.entropy_NC	4	Compactness1_NC	4	Compactness2_CE
3	Edgesharpness_NC	3	GLN_NC	4	Skewness_CE	4	Maximum.3D.diameter_CE
3	Edgesharpness_CE	3	RLN_NC	4	Kurtosis_CE	4	Sphericity_CE
3	Edgesharpness_NH	3	RP_NC	4	Uniformity_CE	4	Surface.area_CE
3	Surface.area_NC	3	LGLRE_NC	4	Compactness2_CE	4	SRE_CE
3	Surface.area_CE	3	HGLRE_NC	4	Sphericity_CE	4	SRHGLE_CE
				4	Compactness2_NC	4	Skewness_CE
4	Entropy_CE	4	Proportion_CE	4	Compactness2_NH	4	Kurtosis_CE
4	Kurtosis_CE	4	Kurtosis_CE	4	Sphericity_NH	4	Entropy_NH
4	Skewness_CE	4	Uniformity_CE	4	Cluster.shade_CE	4	Compactness2_NH
4	Uniformity_CE	4	Compactness2_CE	4	Energy_CE_T	4	Sphericity_NH
4	Compactness2_CE	4	Spherical.disproportion_CE	4	Homogeneity1_CE	4	Cluster.shade_CE
4	Sphericity_CE	4	Sphericity_CE	4	Homogeneity2_CE	4	Inverse.variance_CE
4	Proportion_NH	4	Surface.to.volume.ratio_CE	4	IMC1_CE	4	SRLGLE_CE
4	Entropy_NH	4	Spherical.disproportion_NC	4	IDMN_CE	4	IMC1_NC
4	Uniformity_NH	4	Surface.to.volume.ratio_NC	4	IDN_CE	4	Cluster.shade_NH
4	Compactness2_NH	4	Entropy_NH	4	Inverse.variance_CE	4	Energy_NH_T
4	Spherical.disproportion_NH	4	Compactness2_NH	4	Maximum.Probability_CE	4	Homogeneity1_NH
4	Sphericity_NH	4	Spherical.disproportion_NH	4	SRE_CE	4	Homogeneity2_NH
4	Surface.to.volume.ratio_NH	4	Sphericity_NH	4	RLN_CE	4	IMC1_NH
4	Cluster.shade_CE	4	Surface.to.volume.ratio_NH	4	HGLRE_CE	4	IDMN_NH
4	Energy_CE_T	4	Cluster.shade_CE	4	SRLGLE_CE	4	IDN_NH
4	Homogeneity1_CE	4	Energy_CE_T	4	SRHGLE_CE	4	Maximum.Probability_NH
4	Homogeneity2_CE	4	Homogeneity1_CE	4	IMC1_NC	4	SRE_NH
4	IMC1_CE	4	Homogeneity2_CE	4	Cluster.shade_NH	4	RLN_NH
4	IDMN_CE	4	IMC1_CE	4	Energy_NH_T	4	HGLRE_NH
4	IDN_CE	4	Inverse.variance_CE	4	Homogeneity1_NH	4	SRLGLE_NH
4	Inverse.variance_CE	4	Maximum.Probability_CE	4	Homogeneity2_NH	4	SRHGLE_NH
4	Maximum.Probability_CE	4	SRE_CE	4	IMC1_NH	4	Correlation_NH
4	SRE_CE	4	RLN_CE	4	IDMN_NH	4	LRHGLE_CE
4	RLN_CE	4	HGLRE_CE	4	IDN_NH	4	Homogeneity2_CE
4	HGLRE_CE	4	SRLGLE_CE	4	Maximum.Probability_NH	4	Homogeneity1_CE
4	SRLGLE_CE	4	SRHGLE_CE	4	SRE_NH	4	IMC1_CE
4	SRHGLE_CE	4	IMC1_NC	4	RLN_NH	4	IDMN_CE
4	IMC1_NC	4	Cluster.shade_NH	4	HGLRE_NH	4	IDN_CE
4	Cluster.shade_NH	4	Energy_NH_T	4	SRLGLE_NH	4	RLN_CE
4	Energy_NH_T	4	Homogeneity1_NH	4	SRHGLE_NH	4	Maximum.Probability_CE
4	Homogeneity1_NH	4	Homogeneity2_NH	4	Entropy_NH	4	Energy_CE_T
4	Homogeneity2_NH	4	IMC1_NH	4	Proportion_NH	4	HGLRE_CE
4	IMC1_NH	4	IDMN_NH	4	Entropy_CE		
4	IDMN_NH	4	IDN_NH			5	Surface.to.volume.ratio_CE
4	IDN_NH	4	Maximum.Probability_NH	5	Surface.to.volume.ratio_CE	5	Spherical.disproportion_CE
4	Maximum.Probability_NH	4	SRE_NH	5	Spherical.disproportion_CE	5	Spherical.disproportion_NC
4	SRE_NH	4	RLN_NH	5	Spherical.disproportion_NH	5	Surface.to.volume.ratio_NC
4	RLN_NH	4	HGLRE_NH	5	Surface.area_NH	5	Kurtosis_NH
4	HGLRE_NH	4	SRLGLE_NH	5	Surface.to.volume.ratio_NH	5	Skewness_NH
4	SRLGLE_NH	4	SRHGLE_NH	5	Area_NH	5	Uniformity_NH
4	SRHGLE_NH			5	Energy_NH	5	Spherical.disproportion_NH
		5	Slope_NH	5	Slope_NH	5	SRLGLE_NC
5	Slope_NH	5	Energy_NH	5	Maximum_NH	5	SRHGLE_NC
5	Energy_NH	5	Maximum_NH	5	Mean_NH	5	Surface.area_NH
5	Kurtosis_NH	5	Mean_NH	5	Mean.absolute.deviation_NH	5	Slope_NH
5	Maximum_NH	5	Mean.absolute.deviation_NH	5	Median_NH	5	Energy_NH
5	Mean_NH	5	Median_NH	5	Minimum_NH	5	Maximum_NH
5	Mean.absolute.deviation_NH	5	Range_NH	5	Range_NH	5	Mean_NH
5	Median_NH	5	RMS_NH	5	RMS_NH	5	Mean.absolute.deviation_NH
5	Minimum_NH	5	Standard.deviation_NH	5	Standard.deviation_NH	5	Median_NH
5	Range_NH	5	Variance_NH	5	Variance_NH	5	Minimum_NH
5	RMS_NH	5	SRE_NC	5	Auto.correlation_NH	5	Range_NH
5	Skewness_NH	5	SRLGLE_NC	5	Cluster.prominence_NH	5	RMS_NH
5	Standard.deviation_NH	5	SRHGLE_NC	5	Cluster.tendency_NH	5	Standard.deviation_NH
5	Variance_NH	5	Auto.correlation_NH	5	Contrast_NH	5	Variance_NH
5	SRE_NC	5	Cluster.prominence_NH	5	Correlation_NH	5	Surface.to.volume.ratio_NH
5	SRLGLE_NC	5	Cluster.tendency_NH	5	Difference.entropy_NH	5	SRE_NC
5	SRHGLE_NC	5	Contrast_NH	5	Dissimilarity_NH	5	Auto.correlation_NH
5	Auto.correlation_NH	5	Correlation_NH	5	Entropy_NH_T	5	Cluster.prominence_NH
5	Cluster.prominence_NH	5	Difference.entropy_NH	5	IMC2_NH	5	Cluster.tendency_NH
5	Cluster.tendency_NH	5	Dissimilarity_NH	5	Inverse.variance_NH	5	Contrast_NH
5	Contrast_NH	5	Entropy_NH_T	5	Sum.average_NH	5	Difference.entropy_NH
5	Correlation_NH	5	IMC2_NH	5	Sum.entropy_NH	5	Dissimilarity_NH
5	Difference.entropy_NH	5	Inverse.variance_NH	5	Sum.variance_NH	5	Entropy_NH_T
5	Dissimilarity_NH	5	Sum.average_NH	5	Variance_NH_T	5	IMC2_NH
5	Entropy_NH_T	5	Sum.entropy_NH	5	LRE_NH	5	Inverse.variance_NH
5	IMC2_NH	5	Sum.variance_NH	5	GLN_NH	5	Sum.average_NH
5	Inverse.variance_NH	5	Variance_NH_T	5	RP_NH	5	Sum.entropy_NH
5	Sum.average_NH	5	LRE_NH	5	LGLRE_NH	5	Sum.variance_NH
5	Sum.entropy_NH	5	GLN_NH	5	LRLGLE_NH	5	Variance_NH_T
5	Variance_NH_T	5	RP_NH	5	LRHGLE_NH	5	LRE_NH
5	LRE_NH	5	LGLRE_NH	5	Edgesharpness_NH	5	GLN_NH
5	GLN_NH	5	LRLGLE_NH	5	Skewness_NH	5	RP_NH
5	RP_NH	5	LRHGLE_NH	5	Kurtosis_NH	5	LGLRE_NH
5	LGLRE_NH	5	Skewness_NH	5	Uniformity_NH	5	LRLGLE_NH
5	LRLGLE_NH	5	Kurtosis_NH	5	SRE_NC	5	LRHGLE_NH
5	LRHGLE_NH	5	Uniformity_NH	5	SRHGLE_NC	5	Longestaxis_NH
5	LRHGLE_NH	5	Minimum_NH	5	SRLGLE_NC	5	Area_NH

CE = contrast enhancing, NC = necrotic, NH = non-enhancing T2 high signal intensity, T = texture feature