WHAT IS CLAIMED IS:

1. An ex vivo method for predicting a subject's diagnostic status with respect to a disease or disorder, comprising:

(a) exposing a biological sample of a subject to a light source;

(b) acquiring a plurality of Raman spectra from the biological sample;

(c) processing the plurality of Raman spectra to generate a spatial map of the plurality of Raman spectra; and

(d) predicting the subject's diagnostic status with respect to the disease or disorder based at least in part on the spatial map of the plurality of Raman spectra, wherein the predicting the subject's diagnostic status with respect to the disease or disorder comprises processing the spatial map using a trained model, wherein the trained model is configured to process one or more features selected from the group consisting of Lmax, determination of a linear slope of the temporal stress profile, determination of a plurality of non-linear parameters describing curvature of the temporal stress profile, determination of an abrupt change in intensity of the temporal stress profile, determination of one or more changes in a baseline intensity of the temporal stress profile, determination of a change of a frequency-domain representation of the temporal stress profile, determination of a change of the power-spectral domain representation of the temporal stress profile, determination of one or more recurrence quantification analysis parameters, determination of one or more cross-recurrence quantification analysis parameters, determination of one or more joint recurrence quantification analysis parameters, determination of one or more multi-dimensional recurrence quantification analysis parameters, estimation of a Lyapunov spectra, determination of a maximum Lyapunov exponent and any combination thereof.

2. The method of claim 1, wherein the biological sample comprises a tooth sample, a hair sample, a nail sample, or any combination thereof.

3. The method of claim 1, further comprising detecting or monitoring changes in a temporal stress profile of the spatial map that are indicative of a temporal response of the subject, wherein the temporal response comprises a biological response, a physiological response, an anatomical response, a treatment response, a stress-related response, or a combination thereof response.

4. The method of claim 1, wherein the plurality of Raman spectra comprises from about 200 to about 3700 wave numbers.

5. The method of claim 1, wherein the light source comprises a laser, wherein the laser comprises a wavelength of about 785 nm, a wavelength of about 532 nm, or any combination thereof.

6. The method of claim 1, wherein the acquiring is performed using an integration time of about 0.2 seconds to about 0.3 seconds.

7. The method of claim 1, wherein the acquiring comprises moving the biological sample with a step size of about 2 microns to about 5 microns, subsequent to acquiring a Raman spectrum of the plurality of Raman spectra.

8. The method of claim 1, wherein the disease or disorder comprises autism spectrum disorder (ASD), attention deficit/hyperactivity disorder (ADHD), amyotrophic lateral sclerosis (ALS), schizophrenia, irritable bowel disease (IBD), pediatric kidney disease, kidney transplant rejection, pediatric cancer or any combination thereof.

9. The method of claim 1, wherein the trained model is selected from the group consisting of: a gradient-boosted ensemble model, a neural network algorithm, a support vector machine algorithm, a decision tree algorithm, an unsupervised clustering algorithm, a supervised clustering algorithm, a regression algorithm, a gradient-boosting algorithm, and any combination thereof.

10. The method of claim 1, wherein the trained model is configured to process two or more features selected from the group consisting of, a determination of a linear slope of the temporal stress profile, determination of a plurality of non-linear parameters describing curvature of the temporal stress profile, determination of an abrupt change in intensity of the temporal stress profile, determination of one or more changes in a baseline intensity of the temporal stress profile, determination of a change of a frequency-domain representation of the temporal stress

profile, determination of a change of the power-spectral domain representation of the temporal stress profile, determination of one or more recurrence quantification analysis parameters, determination of one or more cross-recurrence quantification analysis parameters, determination of one or more joint recurrence quantification analysis parameters, determination of one or more multi-dimensional recurrence quantification analysis parameters, estimation of a Lyapunov spectra, determination of a maximum Lyapunov exponent and any combination thereof.

11. A device comprising one or more processors, and memory storing one or more programs for execution by the one or more processors, the one or more programs comprising instructions for:

(a) sampling each respective position in a plurality of positions along a reference line on a biological sample of a subject associated with a Raman signature of the subject, thereby obtaining a plurality of Raman spectra, each Raman spectrum in the plurality of Raman spectra corresponding to a different position in the plurality of positions, and each position in the plurality of positions representing a different period of growth of the biological sample associated with the Raman signature;

(b) analyzing each of the plurality of Raman spectra across a reference line on the biological sample thereby obtaining a first dataset;

(c) deriving a respective second dataset from the corresponding plurality of the Raman spectra measurements, each respective feature in the corresponding set of features being determined by a sequential variation in the Raman spectra; and

(d) processing the features using a trained model to predict a subject's diagnostic status with respect to disease or disorder associated with the Raman signature, wherein the predicting the subject's diagnostic status with respect to the disease or disorder comprises processing changes in the Raman spectra across the plurality of positions with a trained model, wherein the trained model is configured to process one or more features selected from the group consisting of determination of a linear slope of the plurality of Raman spectra across a reference line, determination of a plurality of non-linear parameters describing curvature of the plurality of Raman spectra across a reference line, determination of an abrupt change in intensity of the plurality of Raman spectra across a reference line, determination of one or more changes in a baseline intensity of the plurality of Raman spectra across a reference line, determination of a change of a frequency-domain representation of the plurality of Raman spectra across a reference

line, determination of a change of the power-spectral domain representation of the plurality of Raman spectra across a reference line, determination of one or more recurrence quantification analysis parameters, determination of one or more cross-recurrence quantification analysis parameters, determination of one or more joint recurrence quantification analysis parameters, determination of one or more multi-dimensional recurrence quantification analysis parameters, estimation of a Lyapunov spectra, determination of a maximum Lyapunov exponent and any combination thereof.

12. The device of claim 11, wherein the biological sample comprises a tooth sample, a hair sample, a nail sample, or any combination thereof.

13. The device of claim 11, wherein the instructions further comprise detecting or monitoring changes in the Raman spectra across the plurality of positions indicative of a temporal response of the subject.

14. The device of claim 13, wherein the temporal response comprises a biological response, a physiological response, an anatomical response, a treatment response, a stress-related response, or a combination thereof response.

15. The device of claim 11, wherein the plurality of Raman spectra comprises from about 200 to about 3700 wave numbers.

16. The device of claim 11, wherein the sampling (a) comprises using a Raman spectroscopy microscope.

17. The device of claim 11, wherein the sampling comprises exposing the biological sample to a light source to generate the Raman spectra of the plurality of Raman spectra at the plurality of positions.

18. The device of claim 17, wherein the light source comprises a laser, wherein the laser comprises a wavelength of about 785 nm, a wavelength of about 532 nm, or any combination thereof.

19. The device of claim 11, wherein the instructions further comprise translating, wherein translating comprises moving the biological sample with a step size of about 2 microns to about 5 microns from a first position to a second position of the plurality of positions subsequent to acquiring a Raman spectrum of the plurality of Raman spectra.

20. The device of claim 19, wherein the translating is performed using an integration time of about 0.2 seconds to about 0.3 seconds.

21. The device of claim 11, wherein the disease or disorder comprises autism spectrum disorder (ASD), attention deficit/hyperactivity disorder (ADHD), amyotrophic lateral sclerosis (ALS), schizophrenia, irritable bowel disease (IBD), pediatric kidney disease, kidney transplant rejection, pediatric cancer or any combination thereof.

22. The device of claim 11, wherein the trained model is selected from the group consisting of: a gradient-boosted ensemble model, a neural network algorithm, a support vector machine algorithm, a decision tree algorithm, an unsupervised clustering algorithm, a supervised clustering algorithm, a regression algorithm, a gradient-boosting algorithm, and any combination thereof.

23. The device of claim 11, wherein the trained model is configured to process two or more features selected from the group consisting of a determination of a linear slope of the plurality of Raman spectra across a reference line, determination of a plurality of non-linear parameters describing curvature of the plurality of Raman spectra across a reference line, determination of an abrupt change in intensity of the plurality of Raman spectra across a reference line, determination of one or more changes in a baseline intensity of the plurality of Raman spectra across a reference line, determination of a change of a frequency-domain representation of the plurality of Raman spectra across a reference line, determination of a change of the power-

spectral domain representation of the plurality of Raman spectra across a reference line, determination of one or more recurrence quantification analysis parameters, determination of one or more cross-recurrence quantification analysis parameters, determination of one or more joint recurrence quantification analysis parameters, determination of one or more multi-dimensional recurrence quantification analysis parameters, estimation of a Lyapunov spectra, determination of a maximum Lyapunov exponent and any combination thereof.

24. A non-transitory computer readable storage medium and one or more computer programs embedded therein for classification, the one or more computer programs comprising instructions which, when executed by a computer system, cause the computer system to perform a method comprising:

(a) sampling each respective position in a plurality of positions along a reference line on a biological sample of a subject associated with a Raman signature of the subject, thereby obtaining a plurality of Raman spectra, each Raman spectra in the plurality of Raman spectra corresponding to a different position in the plurality of positions, and each position in the plurality of positions representing a different period of growth of the biological sample associated with the Raman signature;

(b) analyzing each of the plurality of Raman spectra across a reference line on the biological sample thereby obtaining a first dataset;

(c) deriving a respective second dataset from the corresponding plurality of the Raman spectra measurements, each respective feature in the corresponding set of features being determined by a sequential variation in the Raman spectra; and

(d) processing the features using a trained model to predict a subject's diagnostic status with respect to disease or disorder associated with the Raman signature wherein predicting the subject's diagnostic status with respect to the disease or disorder comprises processing changes in the Raman spectra across the plurality of positions with a trained model, wherein the trained model is configured to process one or more features selected from the group consisting of a determination of a linear slope of the plurality of Raman spectra across a reference line, determination of a plurality of non-linear parameters describing curvature of the plurality of Raman spectra across a reference line, determination of an abrupt change in intensity of the plurality of Raman spectra across a reference line, determination of one or more changes in a

baseline intensity of the plurality of Raman spectra across a reference line, determination of a change of a frequency-domain representation of the plurality of Raman spectra across a reference line, determination of a change of the power-spectral domain representation of the plurality of Raman spectra across a reference line, determination of one or more recurrence quantification analysis parameters, determination of one or more cross-recurrence quantification analysis parameters, determination of one or more joint recurrence quantification analysis parameters, determination of one or more multi-dimensional recurrence quantification analysis parameters, estimation of a Lyapunov spectra, determination of a maximum Lyapunov exponent and any combination thereof.

25. The non-transitory computer readable storage medium of claim 24, wherein the biological sample comprises a tooth sample, a hair sample, a nail sample, or any combination thereof.

26. The non-transitory computer readable storage medium of claim 24, wherein the trained model is configured to process two or more features selected from the group consisting of a determination of a linear slope of the plurality of Raman spectra across a reference line, determination of a plurality of non-linear parameters describing curvature of the plurality of Raman spectra across a reference line, determination of an abrupt change in intensity of the plurality of Raman spectra across a reference line, determination of one or more changes in a baseline intensity of the plurality of Raman spectra across a reference line, determination of a change of a frequency-domain representation of the plurality of Raman spectra across a reference line, determination of a change of the power-spectral domain representation of the plurality of Raman spectra across a reference line, determination of one or more recurrence quantification analysis parameters, determination of one or more cross-recurrence quantification analysis parameters, determination of one or more joint recurrence quantification analysis parameters, determination of one or more multi-dimensional recurrence quantification analysis parameters, estimation of a Lyapunov spectra, determination of a maximum Lyapunov exponent and any combination thereof.