

What is claimed is:

- ~~1. A computer-implemented method for processing an electronic image corresponding to a specimen, the method comprising:~~

 - ~~receiving one or more digital images associated with a tissue specimen, a related case, a patient, and/or a plurality of clinical information;~~
 - ~~determining one or more of a prediction, a recommendation, and/or a plurality of data for the one or more digital images using a machine learning system, the machine learning system having been trained using a plurality of training images, to predict a biomarker and a plurality of genomic panel elements; and~~
 - ~~determining, based on the prediction, the recommendation, and/or the plurality of data, whether to log an output and at least one visualization region as part of a case history within a clinical reporting system.~~
- ~~2. The computer-implemented method of claim 1, wherein the method further comprises generating a notification indicating that a prediction or a visualization for the one or more digital images is available.~~
- ~~3. The computer-implemented method of claim 1, wherein the method further comprises generating an option for a user to review the prediction or the visualization.~~
- ~~4. The computer-implemented method of claim 1, wherein the method further comprises generating one or more displays of at least one recommended treatment based on the prediction.~~

5.——~~The computer-implemented method of claim 4, wherein the one or more displays may be generated through one of a plurality of following methods: an overlay of at least one region of interest layered on top of an original image, a side by side visualization, a report with at least one quantification method, and a summary of at least one digital test run with a plurality of results.~~

6.——~~The computer-implemented method of claim 1, wherein a visualization of digital immunohistochemistry or genomic panel results comprises one of a plurality of methods: an overlay of at least one region of interest layered on top of an original image, a side by side visualization, a report with at least one quantification measure, and a summary of digital tests run with at least one result.~~

7.——~~The computer-implemented method of claim 1, wherein the recommendation of at least one treatment pathway is based on a plurality of clinical practice guidelines.~~

8.——~~The computer-implemented method of claim 1, wherein generating at least one prediction comprises:~~

~~receiving one or more digitized images of a pathology specimen, related information, clinical information, and patient information;~~

~~developing a system that stores and archives a plurality of images and a plurality of corresponding patient data;~~

~~determining at least one predicted biomarker and at least one predicted genomic panel element, based on the plurality of images and the plurality of corresponding patient data;~~

~~generating a list of recommended treatment pathways based on a plurality of predicted biomarker and genomic panel elements; and~~

~~converting one or more prediction value and at least one treatment pathway recommendation to a form readable by a user.~~

~~9. The computer implemented method of claim 8, further comprising outputting the one or more prediction value and the at least one treatment pathway recommendation to a user interface.~~

~~10. A system for processing an electronic image corresponding to a specimen, the system comprising:~~

~~at least one memory storing instructions; and~~

~~at least one processor configured to execute the instructions to perform operations comprising:~~

~~receiving one or more digital images associated with a tissue specimen, a related case, a patient, and/or a plurality of clinical information;~~

~~determining one or more of a prediction, a recommendation, and/or a plurality of data for the one or more digital images using a machine learning system, the machine learning system having been trained using a plurality of training images, to predict a biomarker and a plurality of genomic panel elements; and~~

determining, based on the prediction, the recommendation, and/or the plurality of data, whether to log an output and at least one visualization region as part of a case history within a clinical reporting system.

11.—The system of claim 10, wherein the method further comprises generating a notification indicating that a prediction or a visualization for the one or more digital images is available.

12.—The system of claim 10, wherein the method further comprises generating an option for a user to review the prediction or the visualization.

13.—The system of claim 10, wherein the method further comprises generating one or more displays of at least one recommended treatment based on the prediction.

14.—The system of claim 10, wherein the one or more displays may be generated through one of a plurality of following methods: an overlay of at least one region of interest layered on top of an original image, a side by side visualization, a report with at least one quantification method, and a summary of at least one digital test run with a plurality of results.

15.—The system of claim 10, wherein a visualization of digital immunohistochemistry or genomic panel results comprises one of a plurality of methods: an overlay of at least one region of interest layered on top of an original

~~image, a side by side visualization, a report with at least one quantification measure, and a summary of digital tests run with at least one result.~~

~~16.—The system of claim 10, wherein the recommendation of at least one treatment pathway is based on a plurality of clinical practice guidelines.~~

~~17.—The system of claim 10, wherein generating at least one prediction comprises:~~

~~receiving one or more digitized images of a pathology specimen, related information, clinical information, and patient information;~~

~~developing a system that stores and archives a plurality of images and a plurality of corresponding patient data;~~

~~determining at least one predicted biomarker and at least one predicted genomic panel element, based on the plurality of images and the plurality of corresponding patient data;~~

~~generating a list of recommended treatment pathways based on a plurality of predicted biomarker and genomic panel elements; and~~

~~converting one or more prediction value and at least one treatment pathway recommendation to a form readable by a user.~~

~~18.—The system of claim 10, further comprising outputting the one or more prediction value and the at least one treatment pathway recommendation to a user interface.~~

~~19. A non-transitory computer readable medium storing instructions that, when executed by a processor, cause the processor to perform a method for monitoring health of a population, the method comprising:~~

~~receiving one or more digital images associated with a tissue specimen, a related case, a patient, and/or a plurality of clinical information;~~

~~determining one or more of a prediction, a recommendation, and/or a plurality of data for the one or more digital images using a machine learning system, the machine learning system having been trained using a plurality of training images, to predict a biomarker and a plurality of genomic panel elements; and~~

~~determining, based on the prediction, the recommendation, and/or the plurality of data, whether to log an output and at least one visualization region as part of a case history within a clinical reporting system.~~

~~20. The method of claim 19, wherein the method further comprises generating a notification indicating that a prediction or a visualization for the one or more digital images is available.~~

1. A computer-implemented method for processing an electronic image corresponding to a specimen, the method comprising:

receiving one or more digital images associated with a tissue specimen, a related case, a patient, and/or a plurality of clinical information;

determining a prediction of a biomarker and a plurality of genomic panel elements, for the one or more digital images using a machine learning system, the machine learning system having been trained using a plurality of training images, to predict the biomarker and the plurality of genomic panel elements;

generating, based on the prediction of the predicted biomarker and genomic panel elements, a list of recommended treatment pathways;

determining, based on the prediction of the predicted biomarker and genomic panel elements, whether to log an output and at least one visualization region as part of a case history within a clinical reporting system; and

generating one or more displays of at least one recommended treatment of the list of recommended treatment pathways based on the prediction of the predicted biomarker and genomic panel elements, through at least one of an overlay of at least one region of interest layered on top of the one or more digital images and a side by side visualization of the one or more digital images with the prediction displayed and the one or more digital images without the prediction displayed.

2. The computer-implemented method of claim 1, wherein the method further comprises generating a notification indicating that the prediction or the side by side visualization for the one or more digital images is available.

3. The computer-implemented method of claim 1, wherein the method further comprises generating an option for a user to review the prediction or the side by side visualization.

4. The computer-implemented method of claim 1, wherein the side by side visualization comprises digital immunohistochemistry or genomic panel results comprising a summary of digital tests run with at least one result.

5. The computer-implemented method of claim 1, wherein determining the prediction comprises:

receiving one or more digitized images of a pathology specimen, related information, clinical information, and patient information;

developing a system that stores and archives a plurality of images and a plurality of corresponding patient data;

determining at least one predicted biomarker and at least one predicted genomic panel element, based on the plurality of images and the plurality of corresponding patient data; and

converting one or more prediction value and at least one treatment pathway recommendation to a form readable by a user.

6. The computer-implemented method of claim 5, further comprising outputting the one or more prediction value and the at least one treatment pathway recommendation to a user interface.

7. A system for processing an electronic image corresponding to a specimen, the system comprising:

at least one memory storing instructions; and

at least one processor configured to execute the instructions to perform operations comprising:

receiving one or more digital images associated with a tissue specimen, a related case, a patient, and/or a plurality of clinical information;

determining a prediction of a biomarker and a plurality of genomic panel elements, for the one or more digital images using a machine learning system, the machine learning system having been trained using a plurality of training images, to predict the biomarker and the plurality of genomic panel elements;

generating, based on the prediction of the predicted biomarker and genomic panel elements, a list of recommended treatment pathways;

determining, using the machine learning system and based on the prediction, whether to log an output and at least one visualization region as part of a case history within a clinical reporting system; and

generating a visualization of digital immunohistochemistry or genomic panel results based on the prediction of the predicted biomarker and genomic panel elements by at least one of an overlay of at least one region of interest layered on top of the one or more digital images and a side by side visualization of the one or more digital images with the prediction displayed and the one or more digital images without the prediction displayed.

8. The system of claim 7, the operations further comprising:

generating a notification indicating that the prediction or the visualization for the one or more digital images is available.

9. The system of claim 7, the operations further comprising: generating an option for a user to review the prediction or the side by side visualization.

10. The system of claim 7, the operations further comprising: generating one or more displays of at least one recommended treatment based on the prediction.

11. The system of claim 7, the operations further comprising: generating one or more displays of at least one recommended treatment based on the prediction, through at least one of through at least one of an overlay of at least one region of interest layered on top of the one or more digital images and a side by side visualization of the one or more digital images with the prediction displayed and the one or more digital images without the prediction displayed.

12. The system of claim 7, wherein the recommendation of at least one treatment pathway is based on a plurality of clinical practice guidelines.

13. The system of claim 7, wherein determining the prediction comprises: receiving one or more digitized images of a pathology specimen, related information, clinical information, and patient information;

developing a system that stores and archives a plurality of images and a plurality of corresponding patient data;

determining at least one predicted biomarker and at least one predicted genomic panel element, based on the plurality of images and the plurality of corresponding patient data; and

converting one or more prediction value and at least one treatment pathway recommendation to a form readable by a user.

14. The system of claim 13, the operations further comprising outputting the one or more prediction value and the at least one treatment pathway recommendation to a user interface.

15. A non-transitory computer readable medium storing instructions that, when executed by a processor, cause the processor to perform operations for monitoring health of a population, the operations comprising:

receiving one or more digital images associated with a tissue specimen, a related case, a patient, and/or a plurality of clinical information;

determining a prediction of a biomarker and a plurality of genomic panel elements, the one or more digital images using a machine learning system, the machine learning system having been trained using a plurality of training images, to predict the biomarker and the plurality of genomic panel elements;

generating a list of recommended treatment pathways based on the prediction of the predicted biomarker and genomic panel elements;

determining, based on the prediction of the predicted biomarker and genomic panel elements, to log an output and at least one visualization region as part of a case history within a clinical reporting system; and

generating one or more displays of at least one recommended treatment, based on the prediction of the predicted biomarker and genomic panel elements, through at least one of an overlay of at least one region of interest layered on top of the one or more digital images and a side by side visualization of the one or more digital images with the prediction displayed and the one or more digital images without the prediction displayed.

16. The computer readable medium of claim 15, wherein the operations further comprise generating a notification indicating that the prediction or the side by side visualization for the one or more digital images is available.

17. The computer-implemented method of claim 5, wherein the at least one treatment pathway is based on a plurality of clinical practice guidelines.

18. The computer-implemented method of claim 1, wherein the at least one treatment pathway comprises a validated treatment pathway, a new treatment pathway, and/or a clinical treatment pathway based on the prediction.

19. The system of claim 7, wherein the at least one treatment pathway comprises a clinical trial and/or a treatment based on the prediction.