

What is claimed is:

1. A computer-implemented method for processing electronic images, the method comprising: receiving a digital image corresponding to a target specimen associated with a pathology category, wherein the digital image is an image of human or animal tissue and/or an image algorithmically generated to replicate human or animal tissue; determining a quality control (QC) machine learning model, the QC machine learning model being generated by processing a plurality of training images, associated with the pathology category, to predict a quality designation based on one or more artifacts; providing the digital image as an input to the QC machine learning model; receiving the quality designation for the digital image as an output from the QC machine learning model; determining a quality assurance (QA) machine learning model different than the QC machine learning model, the QA machine learning model being generated by processing a plurality of training images, associated with the pathology category, to predict a disease designation based on one or more biomarkers; providing the digital image as an input to the QA machine learning model based on the quality designation being an approved quality designation; receiving the disease designation for the digital image as an output from the QA machine learning model; receiving an external designation for one of the digital image or the target specimen, the external designation generated by a user and comprising a disease property; evaluating the external designation by comparing the disease designation to the external designation; rejecting the external designation based on the evaluation, based on the external designation deviating from the disease designation; and outputting a comparison result based on evaluating the external designation by comparing the disease designation to the external designation.

2. The computer-implemented method of claim 1, wherein the pathology category is one of histology, cytology, frozen section, or immunohistochemistry.

3. The computer-implemented method of claim 1, wherein the QC machine learning model is trained such that its parameters are set to detect a presence, absence, or degree of an artifact in each training image.

4. The computer-implemented method of claim 1, further comprising automatically generating a notification based on quality characteristic, the notification comprising an artifact presence, absence, or degree designation.

5. The computer-implemented method of claim 1, wherein outputting the quality designation of the digital image further comprises a visual indicator corresponding to an artifact of the digital image.

6. The computer-implemented method of claim 1, wherein outputting the quality designation of the digital image further comprises generating a report comprising at least one of a type of artifact found, a number of artifacts found, clinical impact of an artifact found, a time to rectify an artifact, potential pattern, or correlation in a plurality of artifacts.

7. The computer-implemented method of claim 1, wherein the one or more artifacts comprise a missing tissue, a glass crack, a bubble, a blur amount, a missing tissue, a folded tissue, a line, a scratch, dust, pen, or a stain amount.

8. A computer-implemented method for processing electronic images, the method comprising: receiving at least one digital image corresponding to a target specimen associated with a pathology category, wherein the digital image is an image of human or animal tissue and/or an image algorithmically generated to replicate human or animal tissue; determining a quality assurance (QA) machine learning model, the QA machine learning model being generated by processing a plurality of training images, associated with the pathology category, to predict a disease designation based on one or more biomarkers; providing the digital image as an input to the QA machine learning model; receiving the disease designation for the digital image as an output from the QA machine learning model; receiving an external designation for one of the digital image or the target specimen, the external designation generated by a user and comprising a disease property; evaluating the external designation by comparing the disease designation to the external designation; rejecting the external designation based on the evaluation, based on the external designation deviating from the disease designation; and outputting a comparison result based on evaluating the external designation by comparing the disease designation to the external designation.

9. The computer-implemented method of claim 8, wherein the comparison result is a discrepancy indication.

10. The computer-implemented method of claim 9, further comprising determining a discrepancy level based on the discrepancy indication; generating a warning if the discrepancy level is below a threshold; and generating a trigger if the discrepancy

level is above the threshold.

11. The computer-implemented method of claim 10, wherein the trigger comprises at least one of a manual re-designation of the digital image or a generation of an alert.

12. The computer-implemented method of claim 8, wherein the disease designation is at least one of a cancer detection, cancer grade, cancer origin, diagnosis, a presence or absence of a microorganism, specimen type, cancer type, cancer status, tumor size, lesions risk level, or grade.

13. The computer-implemented method of claim 12, wherein the QA machine learning model is trained based on the presence, absence, or degree of a disease designation in each training image.

14. The computer-implemented method of claim 8, wherein the external designation is at least one of a manual designation or an automated designation.

15. The computer-implemented method of claim 8, further comprising generating a notification based on the comparison result if the comparison result is a discrepancy designation.

16. The computer-implemented method of claim 8, wherein an external designation is provided by a health care professional, a third-party entity, or a secondary system.

17. The computer-implemented method of claim 8, further comprising outputting a

visual indicator corresponding to the comparison result.

18. The computer-implemented method of claim 8, further comprising: receiving a plurality of additional comparison results; and generating a report based on the comparison result and the additional comparison results, the report comprising at least one of a type of discordance, type of concordance, number of discordances rectified to be concordant, or follow-up discordance.

19. A system for processing electronic images, the system comprising: at least one memory storing instructions; and at least one processor executing the instructions to perform operations comprising: receiving at least one digital image corresponding to a target specimen associated with a pathology category, wherein the digital image is an image of human or animal tissue and/or an image algorithmically generated to replicate human or animal tissue; determining a quality assurance (QA) machine learning model, the QA machine learning model generated by processing a plurality of training images, associated with the pathology category, to predict a disease designation based on one or more biomarkers; providing the digital image as an input to the QA machine learning model; receiving the disease designation for the digital image as an output from the QA machine learning model; receiving an external designation for one of the digital image or the target specimen, the external designation generated by a user and comprising a disease property; evaluating the external designation by comparing the disease designation to the external designation; rejecting the external designation based on the evaluation, based on the external designation deviating from the disease designation; and outputting a

comparison result based on evaluating the external designation by comparing the disease designation to the external designation.