[0004] Therefore, it is desirable to provide systems and methods for processing and imaging the biological samples with enhanced throughput and reduced idle time. It is also desirable to provide an automated process that reduces manual intervention and overall cost associated with the idle time of components of the system.

BRIEF DESCRIPTION

[0005] A method for processing and imaging a first and second plurality of samples, comprising processing at least one sample from the first plurality of samples, imaging the at least one sample from the first plurality of samples, while simultaneously processing at least one sample from the second plurality of samples; imaging the at least one processed sample from the second plurality of samples and imaging one of the first or the second plurality of samples, prior to processing, while the other set of sample is being processed, to establish background images, wherein the sample is grouped into said first and second plurality of samples based on the scan area of each sample, as well as information about the processing, to achieve minimum time-to-completion grouping of samples.

[0006] An automated method for processing and imaging a first and second plurality of samples, comprising processing at least one sample from the first or the second plurality of samples while imaging another one or more samples from the first or the second plurality of samples, wherein processing comprises staining, rinsing, bleaching, applying an imaging solution, optionally applying a coverslip, optionally removing a coverslip, or combinations thereof; and imaging one of the first or the second plurality of samples, prior to processing, while the other sample is being processed, to establish background images, wherein the sample is grouped into the first or the second plurality of samples based on the scan area of each sample, as well as information about the processing, to achieve minimum time-to-completion grouping of samples.

[0007] In one embodiment, a system for processing and imaging a first and second plurality of samples comprises a sample processing unit configured to process one or

more of the first and the second plurality of samples, an image acquisition unit operatively coupled to the sample processing unit; and a sample conveyance unit configured to transport one or more of the first and the second plurality of samples to the sample processing unit, image acquisition unit, or both, wherein the system is configured to process at least one sample from the first or the second plurality of samples while simultaneously imaging another sample from the first or the second plurality of samples and is further configured to image one of the first or the second plurality of samples, prior to processing, while the other sample is being processed, to establish background images, wherein the at least one sample is grouped into the first or the second plurality of samples based on the scan area of each sample, as well as information about the processing, to achieve minimum time-to-completion grouping of samples.

DRAWINGS

[0008] These and other features, aspects, and advantages of the invention will become better understood when the following detailed description is read with

CLAIMS:

1. An automated method for processing and imaging a first and second plurality of samples, comprising:

processing at least one sample from the first plurality of samples;

imaging the at least one sample from the first plurality of samples, while simultaneously processing at least one sample from the second plurality of samples;

imaging the at least one processed sample from the second plurality of samples; and

imaging one of the first or the second plurality of samples, prior to processing, while the other set of sample is being processed, to establish background images,

wherein the sample is grouped into said first and second plurality of samples based on the scan area of each sample, as well as information about the processing, to achieve minimum time-to-completion grouping of samples.

2. The method of claim 1, wherein the step of processing the first or second plurality of samples may comprise rinsing, staining, bleaching, applying imaging media, optionally applying a coverslip, optionally removing a coverslip, and combinations thereof.

3. The method of claim 1, wherein the first and second plurality of samples are deposited in two discrete locations on a sample stage.

4. The method of claim 1, wherein the step of processing the at least one sample from the first plurality of samples comprises simultaneously processing the first plurality of samples.

5. The method of claim 1, wherein the step of imaging the at least one sample from the first plurality of sample comprises sequentially imaging samples from the first plurality of samples.

6. The method of claim 1, wherein the step of processing the at least one sample from the second plurality of samples comprises simultaneously processing the second plurality of samples.

7. The method of claim 1, wherein the step of imaging the at least one sample from the second plurality of samples comprises sequentially imaging samples from the second plurality of samples.

8. The method of claim 3, wherein the sample stage is a stage of an imaging device.

9. The method of claim 1, further comprising imaging the processed samples from the second plurality of samples while processing at least one sample from the first plurality of samples.

10. The method of claim 1, further comprising transporting the first and second plurality of samples to a sample processing unit or imaging unit by moving a sample stage in a translational motion, rotational motion, or both.

11. An automated method for processing and imaging a first and second plurality of samples, comprising:

processing at least one sample from the first or the second plurality of samples while imaging another one or more samples from the first or the second plurality of samples, wherein processing comprises staining, rinsing, bleaching, applying an imaging solution, optionally applying a coverslip, optionally removing a coverslip, or combinations thereof; and

imaging one of the first or the second plurality of samples, prior to processing, while the other sample is being processed, to establish background images,

wherein the sample is grouped into the first or the second plurality of samples based on the scan area of each sample, as well as information about the processing, to achieve minimum time-to-completion grouping of samples.

12. The method of claim 11, comprising simultaneously processing two or more samples from the first and the second plurality of samples.

13. A system for processing and imaging a first and second plurality of samples, comprising:

a sample processing unit configured to process one or more of the first and the second plurality of samples;

an image acquisition unit operatively coupled to the sample processing unit; and

a sample conveyance unit configured to transport one or more of the first and the second plurality of samples to the sample processing unit, image acquisition unit, or both,

wherein the system is configured to process at least one sample from the first or the second plurality of samples while simultaneously imaging another sample from the first or the second plurality of samples and is further configured to image one of the first or the second plurality of samples, prior to processing, while the other sample is being processed, to establish background images,

wherein the at least one sample is grouped into the first or the second plurality of samples based on the scan area of each sample, as well as information about the processing, to achieve minimum time-to-completion grouping of samples.

14. The system of claim 13, wherein the sample conveyance unit comprises:

a sample stage configured to receive the first and the second plurality of samples; and

a driving member configured to provide a translational movement, rotational movement, or both to the sample stage.

15. The method of claim 1, further comprising acquiring a low magnification image of each sample that relates scan area of each sample and grouping the samples into the first and second plurality of samples based on at least the scan area of each sample.