CLAIMS

1. A method for acquiring images of objects (122) distributed within a specimen (119) affixed to a surface of a slide (102) using a camera (202) having an objective lens (202) with an optical axis (204) that forms a non-orthogonal angle with the surface of the slide (102), the specimen (119) having an uneven height relative to the slide surface, the method comprising:

acquiring a first plurality of images of a first linear portion of the specimen (119);

evaluating a focus of objects (122) within the first linear portion (130) of the specimen (119) captured in the first plurality of images, including determining whether a total number of out-of-focus objects exceeds a threshold number and determining a best focus height of the specimen (119) along the first linear portion (130);

calculating a z focus height curve (810) of the best focus height of the specimen (119) along the first linear portion (130);

if the total number of out-of-focus objects in the first plurality of images exceeds the threshold number, then re-imaging the first linear portion (130) of the specimen (119) to acquire a second plurality of images, wherein a height of the objective lens relative to the slide surface is varied during acquisition of the second plurality of images based on the z focus height curve (810); and

if the total number of out-of-focus objects in the first plurality of images does not exceed the threshold number, then acquiring a second plurality of images of a second linear portion (130) of the specimen (119) directly adjacent to the first linear portion (130), wherein a height of the objective lens relative to the slide surface is varied during acquisition of the second plurality of images based on the z focus height curve (810).

2. The method of claim 1, wherein a height of the objective lens relative to the slide surface (102) is substantially constant during acquisition of the first plurality of images.

3. The method of claim 1 or 2, wherein evaluating the focus of the objects captured in the first plurality of images comprises determining respective heights of the out-of-focus objects relative to the slide surface.

4. The method of claim 3, wherein evaluating the focus of the objects in the first plurality of images comprises determining whether the respective out-of-focus objects are located at a height relative to the slide surface that is outside of an in-focus range of the objective lens during acquisition in the first plurality of images.

5. The method of claim 3 or 4, wherein evaluating the focus of the objects in the first plurality of images comprises determining whether the respective out-of-focus objects are located at a height relative to the slide surface that is higher than a maximum height or lower than a minimum height, respectively, of an in-focus range of the objective lens during acquisition in the first plurality of images.

6. The method of any of claims 1-5, wherein evaluating the focus of the objects in the first plurality of images includes determining respective locations of out-of-focus objects within the first linear portion (130).

7. The method of any of claims 1-6, wherein one or both of the camera (202) and slide (102) is moved laterally relative to the other one during acquisition of the images.

8. The method of claim 7, wherein the height of the objective lens (202) relative to the slide surface is varied by increasing and/or decreasing a height of the slide surface relative to the camera as a function of a linear position of the camera with respect to a lengthwise location of the respective linear portion (130).

9. The method of claim 7, wherein the height of the objective lens (202) relative to the slide surface is varied by increasing and/or decreasing a height of the camera (202) relative to the slide surface as a function of a linear position of the camera (202) with respect to a lengthwise location of the respective first or second linear portion (130).

10. The method of any of claims 1-9, wherein the second plurality of images is acquired of the second linear portion, the method further comprising

evaluating a focus of the objects captured in the second plurality of images including determining whether a total number of out-of-focus objects exceeds a threshold number and determining a best focus height of the specimen (119) along the second linear portion (130);

calculating a second z focus height curve (810) of the best focus height of the specimen along the second linear portion (130); and

acquiring a third plurality of images of a third linear portion (130), the third linear portion (130) being directly adjacent to the second linear portion (130), wherein a height of the objective lens (202) relative to the slide surface is varied during acquisition of the third plurality of images based on the second z focus height curve (810).

11. A system for acquiring images of objects (122) distributed within a specimen (119) affixed to a surface of a slide (102), the specimen (119) having an uneven height relative to the slide surface, the system comprising:

a camera (202) having an objective lens (202) with an optical axis (204), wherein the camera (202) is positioned such that the optical axis (204) forms a non-orthogonal angle with the surface of the slide (102);

an image processor operatively coupled with the camera (202); and

wherein the system is configured to perform the method of any of claims 1-10.