CLAIMS:

1. A system comprising:

a light source unit, and at least one imaging unit comprising a detector array,

wherein the detector array comprises at least first and second types of detector cells having corresponding first and second different spectral response functions defining respectively first and second spectral peaks; and a light source unit is configured for emitting light forming illumination including at least first and second discrete wavelength ranges, said at least first and second discrete wavelength ranges being aligned with said first and second spectral peaks of said first and second types of detector cells.

2. The system of claim 1, wherein said light source unit is adapted to provide the illumination within said at least first and second discrete wavelength ranges simultaneously, and at least partially concurrently with operation of said imaging unit for acquisition of image data, such that exposure time of the imaging unit at least partially overlaps with a time period of said illumination.

3. The system of claim 1 or 2, wherein said detector array has at least one of the following configurations:

the detector array is adapted for collecting image data using said at least first and second types of detector arrays simultaneously;

the detector array comprises wavelength selective filter array filtering collected light and defining at least a portion of said first and second spectral response functions of said at least first and second types of detector cells;

the detector array comprises three or more different types of detector cells comprising at least said first and second types of detector cells and at least a third type of detector cells.

4. The system of any one of claims 1 to 3, wherein said detector array is characterized by at least one of the following:

the detector array comprises at least first and second types of detector cells arranged in an interlaced order within a common plane of the detector array, such that image data generated by said detector array comprises at least first and second image portions of a common field of view and associated with said first and second different spectral response functions;

the at least first and second types of detector cells have the first and second different spectral response functions defining respectively first and second spectral peaks corresponding to blue and orange-red colors;

the detector array is selected in accordance with said first and second spectral peaks for obtaining enhanced image data of a biological tissue in the region of interest.

5. The system of any one of claims 1 to 4, wherein said detector array comprises three or more different types of detector cells comprising at least said first and second types of detector cells and at least a third type of detector cells, said three or more types of detector cells comprise detector cells having spectral response functions having spectral peak corresponding to red, green and blue light.

6. The system of any one of claims 1 to 5, wherein said light source unit has at least one of the following configurations:

the light source unit is adapted for emitting at least first and second beams of said illumination corresponding to said at least first and second discrete wavelength ranges toward at least a portion of a field of view of the imaging unit;

the light source unit comprises at least first and second light sources configured for respectively emitting said light formed of said at least first and second discrete wavelength ranges.

7. The system of any one of claims 1 to 6, wherein said at least first and second discrete wavelength ranges in the emitted light are spectrally substantially non-overlapping.

8. The system of any one of claims 1 to 7, wherein said imaging unit further comprises at least one of the following:

a wavelength blocking filter configured for blocking selected input radiation; and

an optical lens arrangement adapted for selectively varying a focusing state for imaging in accordance with data on light collected by selected one of said at least first and second types of detector cells individually.

9. The system of any one of claims 1 to 8, wherein said imaging unit comprises a wavelength blocking filter configured for blocking selected input radiation, said blocking filter comprises an infrared blocking filter configured for filtering out infrared illumination.

10. The system of any one of claims 1 to 9, further comprising a processing unit adapted for receiving image data from said detector array during image acquisition by said imaging unit of light collected from a region of interest subjected to said illumination, and for processing said image data to extract therefrom first and second image data pieces corresponding to collected light in the at least two different wavelength ranges and generate output data indicative of an enhanced image of the region of interest.

11. The system of claim 10, wherein said processing unit is characterized by at least one of the following:

the processing unit generates said output data indicative of an image map based on a relation between selected functions of the at least first and second image data pieces, providing enhancement to contrast of a selected portion of the region of interest over surrounding portions of said region of interest;

the processing unit comprises an intensity calibration module adapted for operating in calibration mode defining an intensity calibration condition according to which intensity of illumination, generated by said light source unit in at least first and second discrete wavelength ranges, provides for obtaining substantially similar intensity response by said first and second types of detector cells;

said processing unit is adapted for operating said light source unit and said imaging unit for illuminating a field of view and collecting image data simultaneously, in either one or both of continuous illumination mode and flash illumination mode.

12. The system of claim 11, wherein said output data is indicative of an image map based on a ratio between selected functions of the at least first and second image data pieces.

13. The system of claim 11 or 12, wherein said intensity calibration module is adapted for operating said light source unit and said imaging unit for collecting image data under illumination of said at least first and second discrete wavelength ranges, determining saturation level for said first and second types of detector cells, and calibrating the intensity of illumination for said at least first and second discrete wavelength ranges in accordance with selected saturation level.

14. The system of any one of claims 1 to 13, wherein said detector array is selected in accordance with said first and second spectral peaks for obtaining enhanced image data associated with blood vessels of a biological tissue in the region of interest.

15. The system of claim 14, configured for obtaining enhanced image data associated with blood vessels in at least one of retina and sclera of a patient's eye.

16. A method for acquiring image of biological tissue, the method comprising: providing image data, which corresponds to a light response of a region of interest to illumination of at least first and second different wavelength ranges, and is collected by a detector array comprising at least first and second different types of detector cells having corresponding first and second different spectral response functions defining respectively first and second spectral peaks aligned with said at least first and second different wavelength ranges, respectively; processing said image data by extracting therefrom at least first and second image data pieces associated with the collected light response by said at least first and second different types of detector cells, and generating output data indicative of an image map in accordance with a relation between said at least first and second image data pieces, said image map thereby providing enhanced contrast image of the region of interest.

17. The method of claim 16, wherein said enhanced contrast image of the region of interest is characterized in enhancement of contrast of a selected portion of the region of interest over surrounding portions of said region of interest being imaged.

18. The method of claim 16 or 17, characterized by at least one of the following:

said image data is collected during an exposure time of said detector array at least partially overlaps with a time period of said illumination;

said image data corresponds to simultaneous illumination of the region of interest by said at least first and second different wavelength ranges;

said at least first and second wavelength ranges are selected to be spectrally non-overlapping.

19. The method of any one of claims 16 to 18, comprising determining a focusing state of an optical arrangement for collection of said image data in accordance with at least one of the following: collection of light of one of said at least first and second different wavelength ranges; and a selected type of detector cells adapted for collection of light.

20. The method of claim 19, further comprising: determining an initial focusing state providing a relatively sharp image, varying a focusing state by a selected amount to provide a relatively blurred image, returning a focusing state toward said initial focusing state in a plurality of small focus steps, for each of said plurality of small focus steps

determining a focusing level indicative of sharpness of the collected image is said one of said at least first and second wavelength ranges, and determining the focusing state in accordance with a focus step having a maximal value of the focusing level.

21. The method of claim 20, wherein said plurality of small focus steps pass said initial focusing state to its other focal side.

22. The method of any one of claims 16 to 21, wherein said region of interest being imaged comprises a biological tissue.

23. The method of claim 22, wherein said enhanced contrast image of the biological tissue is characterized in enhancement of contrast of blood vessels over surrounding portions of the tissue being imaged.

24. The method of any one of claims 16 to 23, further comprising calibrating illumination intensity for said first and second wavelength ranges; said calibration comprising determining initial intensity level for illumination with said first and second wavelength ranges, collecting first image data, determining saturation levels for detector cells of said first and second types of detector cells, and adjusting intensity level for illumination with one or more of said first and second wavelength ranges to provide predetermined saturation levels, said calibrating illumination intensity being characterized by at least one of the following:

comprising iteratively repeating said calibration until reaching at least one of said predetermined saturation levels and predetermine iterative cycles;

comprising determining one or more contrast measures for at least first and second image portions and determining variation in illumination level for at least one of the first and second wavelength ranges to optimize contrast of the first and second image portions.

25. The method of claim 24, wherein said saturation levels are characterized by at least one of the following: said saturation levels are determined by intensity histogram of detector cells of the same type; said saturation levels are associated with difference between intensity histogram of the first and second types of detector cells being within predetermined limits.