Claims

1. A method of determining a concentration of an analyte in a bodily fluid by using a mobile device having a camera, the method comprising:
   a) taking a series of calibration images of at least one region of interest of an object by using the camera, wherein the calibration images differ in their brightness;
   b) deriving from each calibration image of the series taken in step a) at least one key calibration figure characteristic for a tone mapping function of the mobile device;
   c) determining at least one probable tone mapping function of the mobile device by taking into account the key calibration figures from the calibration images of the series taken in step a);
   d) taking at least one analysis image of at least part of a test field of an optical test strip, the test field having the bodily fluid applied thereto; and
   e) determining the concentration of the analyte in the bodily fluid from the analysis image of the test field by taking into account the probable tone mapping function of the mobile device.

2. The method according to the preceding claim, wherein steps d)-e) are performed repeatedly, wherein steps a)-c) either only once initially for a plurality of repetitions of steps d)-e) or each time before performing steps d)-e) or at a predetermined frequency.

3. The method according to any one of the preceding claims, wherein the object comprises the optical test strip, wherein the analysis image coincides with at least one of the calibration images, such that the analysis image is taken as part of the series of calibration images.

4. The method according to any one of the preceding claims, wherein the region of interest comprises at least one element of the group consisting of: a white field; a black field; a grey field; a grey scale step wedge.

5. The method according to any one of the preceding claims, wherein each calibration image comprises at least two regions of interest, wherein particularly a physical brightness ratio between the two regions of interest is known.

6. The method according to any one of the preceding claims, wherein for each calibration image the key calibration figure is derived from at least one brightness value of the region of interest of the calibration image.

7. The method according to any one of the preceding claims, wherein the brightness of the calibration images is varied in step a) by varying a parameter value of at least one of the following parameters: an exposure time; a light sensitivity of an image sensor of the camera; a light intensity of an illuminant.

8. The method according to the preceding claim, wherein step c) comprises determining at least one sampling point for each calibration image wherein the sampling point comprises the key calibration figure and the parameter value.

9. The method according to the preceding claim, wherein step c) comprises determining the probable tone mapping function by at least one of the following: determining a correlation, particularly a fit curve, for the sampling points of the series of calibration images; choosing a correlation, in particular a function, from a predetermined set of correlations, wherein the chosen correlation fits the sampling points of the series of calibration images.

10. The method according to any one of the preceding claims, wherein step e) comprises deriving at least one key analysis figure from at least one brightness value of at least one part of the analysis image showing the at least one part of the test field.

11. The method according to the preceding claim, wherein from each key analysis figure at least one probable analyte measurement figure is derived by applying the inverted probable tone mapping function to the key analysis figure.

12. The method according to any one of the preceding claims, wherein in step e) the analyte concentration is determined from a brightness ratio between the test field having the bodily fluid applied and the region of interest of the object.

13. A computer program comprising computer-executable instructions which, when the computer program is executed by a computer, specifically a processor of a mobile device, cause the computer to carry out method steps b), c) and e) of any one of the preceding claims.

14. A mobile device having a camera and a processor, the processor being configured to perform the following steps:

i.) prompting a user to take a series of calibration images of at least one region of interest of an object by using the camera, wherein the calibration images differ in their brightness;

ii.) deriving from each calibration image of the series taken in step i.) at least one key calibration figure characteristic for a tone mapping function of the mobile device;

iii.) determining at least one probable tone mapping function of the mobile device by taking into account the key calibration figures from the calibration images of the series taken in step i.);

iv.) prompting the user to take at least one analysis image of at least part of a test field of an optical test strip, the test field having the bodily fluid applied thereto; and

v.) determining a concentration of an analyte in a bodily fluid from the analysis image of the test field by taking into account the probable tone mapping function of the mobile device.

15. A kit for determining a concentration of an analyte in a bodily fluid, the kit comprising:

- at least one mobile device according to any one of the preceding claims referring to a mobile device; and
- at least one optical test strip having at least one test field.