What is currently claimed:

1. A digital spatial profiling (DSP) system comprising:

a housing or other structure for containing at least one component of the DSP system, comprising;

a power source;

an ultraviolet (UV) light source (UVS);

a visible light source (VLS) for bright field imaging;

a chamber comprising a slot configured to receive at least a portion of a slide having a tissue sample thereon;

a personal mobile computing device (PMD) comprising a user interface and a camera sensor, the PMD being arranged relative to the chamber in order to image the tissue sample on the slide within the chamber;

photomasking means configured to selectively illuminate the tissue sample with UV light from the UVS and/or visible light from the VLS;

optic means configured to at least one of direct and/or focus the UVS and/or VLS toward at least one of the tissue sample, the chamber, the photomasking means, and the camera sensor; and

processing circuitry configured to:

acquire, via the camera sensor, an image of the tissue sample,

display, via the user interface of the PMD, the image of the tissue sample,

receive, via the user interface of the PMD, user input regarding a region of interest (ROI) of the tissue sample, and

illuminate, using the photomasking means, the ROI with UV light,

wherein the PMD is removably attachable to the housing and/or the chamber.

2. The system of claim 1, wherein:

the photomasking means comprises an LCD having a backlight, and wherein the VLS comprises the LCD backlight or external VLS,

the optics means comprises a first set for the UVS comprising a condenser lens or scan lens, a dichroic mirror, and a second set of optics comprising an objective lens,

the dichroic mirror is configured to redirect light from multiple sources into one optical axis;

the photomasking means comprises an LCD configured as a programmable aperture so as to structure at least one of UV light or visible light to reach the tissue sample only in the ROI;

and/or

the photomasking means comprises at least one of a digital micro-mirror device (DMD), a liquid crystal on silicon (LCoS) display, organic light-emitting diode (OLED), micro light-emitting diode (μLED) array, fiber optic bundle, a liquid crystal displays (LCD), a scanning laser, and a physical barrier.

3. The system of claim 2, wherein:

the photomasking means comprises an LCD including a pixel grid, and wherein the LCD is arranged at a predetermined distance from the tissue;

the predetermined distance is configured such that the tissue sample is not obscured by the pixel grid;

the predetermined distance is selected to be between approximately 0.01 to 5 mm, 0.50 to 2.5 mm, 0.75 to 2.25 mm, or 1 to 2 mm;

and/or

the predetermined distance is configured to provide clear visualization of the tissue sample, and/or to minimize diffusion of UV light.

4. The system of claim 1, wherein:

the system further comprises:

a pump system configured to provide a flow of a solution to the chamber,

and/or

a software application operating on the processing circuitry and configured to cause the PMD to display, as the user interface, a graphical-user-interface (GUI) configured to receive user input to select at least one ROI of the image acquired by the camera sensor and displayed via the user interface of the PMD, and

the photomasking means is configured to provide at least one of: an illumination resolution of between approximately 50 and 300 nm, a field of view between approximately 5-12 cm^2, and a magnification of between approximately 1-5x;

at least one of the housing, the chamber and the slot is configured to receive and/or retrieve at least one solution,

the housing comprises or includes a plurality of scaffolds, a PMD frame, at least one objective lens frame, at least one slide frame, a photomasking frame, at least one condenser frame, and at least one thermal management means,

the housing is configured to removably receive a single objective lens frame of a plurality of objective lens frames each having a different objective lens and corresponding magnification,

and/or

the system is further configured for at least one of dark-field microscopy, bright-field microscopy, phase-contrast microscopy, fluorescence microscopy and microscopy with ultraviolet surface excitation.

5. The system of claim 1, wherein

at least one of the housing, the chamber, and the slot are configured to enable the slide to move relative thereto, and/or

the housing, the chamber and the slot is configured to receive and/or retrieve at least one solution.

6. The system of claim 5, wherein receiving and/or retrieving of the at least one solution is via fluid transport.

7. The system of claim 6, wherein fluid transport comprises at least one of pipetting and capillary action, and wherein pipetting may be either manual or automatic via robotic means.

8. The system of claim 1, wherein the housing comprises or includes a plurality of scaffolds, a PMD frame, at least one objective lens frame, at least one slide frame, a photomasking frame, at least one condenser frame, and at least one thermal management means.

9. The system of claim 8, wherein the thermal management means comprises at least one of a heat sink, a heat pump, a fan, a liquid cooling system, and a peltier device.

10. The system of claim 1, wherein the housing is configured to removably receive a single objective lens frame of a plurality of objective lens frames each having a different objective lens and corresponding magnification.

11. The system of claim 10, wherein each objective lens frame is configured so as to provide a different spacing from the camera sensor.

12. The system of claim 11, wherein the PMD includes a PMD processor, a display, first wireless communication means for communicating information to a remote device either directly or via a network, and a second wireless communications means for communication with a local device.

13. The system of claim 1, further comprising a temperature sensor configured to determine the temperature in at least one of the housing and the chamber.

14. The system of claim 1, wherein the processor is configured to:

receive input from the temperature sensor corresponding to a sensed temperature, and

to at least one of:

turn off the UVS upon the sensed temperature being greater than a predetermined temperature; and

provide at least one of a visual and audible warning upon the sensed temperature being greater than a predetermined amount.

15. The system of claim 1, further comprising:

sealing means to maintain a liquid environment over the tissue sample within the chamber, and/or

manual fluid collection guiding means arranged proximate the tissue sample and configured to enable pipetting solution from the tissue.

16. The system of claim 15, wherein the manual fluid collection guiding means comprises a microarray configured as or with a flow cell, and/or is arranged within or proximate to the chamber; and/or wherein the manual fluid collection guiding means comprises a grid barrier arranged within or proximate to the sealing means.

17. A digital spatial profiling (DSP) method comprising:

providing the system according to claim 1, wherein the processing circuitry is further configured to;

provide illuminating light to the tissue sample on the slide received within the slot of the chamber, wherein the tissue sample has previously been conjugated with an antibody solution and, prior to insertion, covered in a buffer solution, wherein the slide is received within the slot of the chamber for imaging and is aligned with the photomasking means;

imaging the tissue sample with the camera sensor of the PMD under visible light and display the image via the user interface of the PMD display;

receiving a selection of a plurality via the GUI, wherein the selection forms an outline of a rectangle;

define a ROI based on the selected plurality of biomarkers;

cease illuminating visible light; and

expose the ROI of the tissue sample to UV light illumination for a predetermined period of time sufficient to cleave oligos in the ROI in the tissue sample,

wherein the method further comprises

collecting a solution from the tissue sample containing cleaved oligos.

18. The method of claim 17, wherein the processing circuitry is further configured to:

image the photomasking means prior to receipt of the slide so as to calibrate the photomasking means, and/or change the size of the rectangle outlined by the selected markers.

19. A non-transitory computer readable medium having stored thereon instructions for enabling one or more computer processors to conduct one or more steps of the method of claim 17.