SUMMARY OF INVENTION

A first aspect of the present invention provides a method comprising:

positioning a guide plate at a donor site;

aligning a scalpet array of a device with the guide plate at the donor site, wherein the scalpet array comprises at least one scalpet;

incising skin pixels at the donor site with the scalpet array;

preparing a recipient site by positioning the guide plate at the recipient site, and generating with the scalpet array skin defects; and

applying the incised skin pixels at the recipient site.

A second aspect of the present invention provides a method comprising:

positioning a harvest pattern at a donor site;

aligning a scalpet array of a device with the harvest pattern at the donor site, wherein the scalpet array comprises at least one scalpet;

incising skin pixels at the donor site with the scalpet array;

preparing a recipient site by positioning the harvest pattern at the recipient site, and generating with the scalpet array skin defects; and

applying the incised skin pixels at the recipient site.

A third aspect of the present invention provides a method comprising:

positioning a guide plate at a donor site, wherein the guide plate comprises perforations arranged in a configuration;

aligning a scalpet array of a device with the guide plate at the donor site, wherein the scalpet array comprises a plurality of scalpets arranged in the configuration, and the aligning comprises aligning the scalpet array with at least one set of the perforations;

incising skin pixels at the donor site with the scalpet array;

preparing a recipient site by positioning the guide plate at the recipient site, aligning the scalpet array with the guide plate, and generating with the scalpet array skin defects having a same geometry as the incised skin pixels; and

applying the incised skin pixels at the recipient site.

A fourth aspect of the present invention provides a method comprising:

positioning a guide plate at a donor site, wherein the guide plate comprises perforations arranged in a configuration;

aligning a scalpet array of a device with the guide plate at the donor site, wherein the scalpet array comprises a plurality of scalpets arranged in the configuration, and the aligning comprises aligning the scalpet array with at least one set of the perforations;

incising skin pixels at the donor site with the scalpet array;

preparing a recipient site by generating with the scalpet array skin defects in the configuration; and

applying the incised skin pixels at the recipient site.

A fifth aspect of the present invention provides a method comprising:

positioning a guide plate at a donor site, wherein the guide plate comprises perforations arranged in a configuration;

aligning a scalpet array of a device with the guide plate at the donor site, wherein the scalpet array comprises a plurality of scalpets arranged in the configuration, and the aligning comprises aligning the scalpet array with at least one set of the perforations;

incising skin pixels at the donor site with the scalpet array; and

capturing the incised skin pixels and maintaining the captured incised pixels in the configuration.

A sixth aspect of the present invention provides a method comprising:

aligning a scalpet array of a device at a donor site, wherein the scalpet array comprises a plurality of scalpets arranged in a configuration;

incising skin pixels at the donor site with the scalpet array;

capturing the incised skin pixels and removing the incised skin pixels from the donor site; and

transferring the captured incised pixels away from the donor site while maintaining the captured incised pixels in the configuration.

A seventh aspect of the present invention provides a method comprising:

aligning a scalpet array of a device at a donor site, wherein the scalpet array comprises at least one scalpet arranged in a configuration;

incising skin pixels at the donor site with the scalpet array;

capturing the incised skin pixels and transferring them to a recipient site while maintaining the configuration;

generating skin defects at the recipient site with the scalpet array; and

applying the incised skin pixels at the recipient site.

An eighth aspect of the present invention provides a system comprising:

a harvest pattern positioned at a donor site and a recipient site;

a device comprising a scalpet array that includes at least one scalpet, wherein the at least one scalpet is configured to align with the harvest pattern, wherein the at least one scalpet is configured to incise skin pixels at the donor site and generate skin defects at the recipient site; and

an adherent substrate configured to capture the incised skin pixels at the donor site and maintain relative positioning of the incised skin pixels during transfer to the recipient site and application of the incised skin pixels at the recipient site.

A ninth aspect of the present invention provides a system comprising:

a harvest pattern including indicators arranged in a configuration, wherein the harvest pattern is configured to be positioned at a target site and a recipient site;

a device comprising a scalpet array that includes a plurality of scalpets arranged in the configuration, wherein the plurality of scalpets is configured to align with at least one set of the indicators, wherein the plurality of scalpets is configured to incise skin pixels at the target site and generate skin defects at the recipient site; and

an adherent substrate configured to capture the incised skin pixels at the target site and maintain the configuration during application of the incised skin pixels at the recipient site.

A tenth aspect of the present invention provides a system comprising:

a harvest pattern including indicators arranged in a configuration, wherein the harvest pattern is configured to be positioned at a target site and a recipient site; and

a device comprising a scalpet array that includes a plurality of scalpets arranged in the configuration, wherein the plurality of scalpets is configured to align with at least one set of the indicators, wherein the plurality of scalpets is configured to incise skin pixels at the target site and generate skin defects at the recipient site.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows the PAD Kit placed at a target site, under an embodiment.

Figure 2 is a cross-section of a scalpet punch or device including a scalpet array, under an embodiment.

Figure 3 is a partial cross-section of a scalpet punch or device including a scalpet array, under an embodiment.

Figure 4 shows the adhesive membrane with backing (adherent substrate) included in a PAD Kit, under an embodiment.

Figure 5 shows the adhesive membrane (adherent substrate) when used with the PAD Kit frame and blade assembly, under an embodiment.

Figure 6 shows the removal of skin pixels, under an embodiment.

Figure 7 is a side view of blade transection and removal of incised skin pixels with the PAD Kit, under an embodiment.

Figure 8 is an isometric view of blade/pixel interaction during a procedure using the PAD Kit, under an embodiment.

Figure 9 is another view during a procedure using the PAD Kit (blade removed for clarity) showing both harvested skin pixels or plugs transected and captured and non-transected skin pixels or plugs prior to transection, under an embodiment.

Figure 10A is a side view of a portion of the pixel array showing scalpets secured onto an investing plate, under an embodiment.

Figure 10B is a side view of a portion of the pixel array showing scalpets secured onto an investing plate, under an alternative embodiment.

Figure 10C is a top view of the scalpet plate, under an embodiment.

Figure 10D is a close view of a portion of the scalpet plate, under an embodiment.

Figure 11A shows an example of rolling pixel drum, under an embodiment.

Figure 11B shows an example of a rolling pixel drum assembled on a handle, under an embodiment.