

## CLAIMS

1. A microneedle (101) provided on a substrate (102), comprising:

an elongated body (503) extending from a distal end (504) thereof with a bevel (505) to a proximal end (506) on the substrate along a longitudinal axis, wherein

the elongated body comprises a capillary bore (507) extending in a longitudinal direction thereof and defines a fluid path (508);

the proximal end is connected to the substrate and the capillary bore is in fluid communication with a fluid channel (309) of the substrate;

said microneedle being characterized in, that

the cross-sectional area of the capillary bore in the distal end is larger than the cross-sectional area of the capillary bore in the proximal end.

2. A microneedle according to claim 1, wherein the cross sectional area of the capillary bore gradually decreases from the distal end towards the proximal end along the longitudinal direction.

3. A microneedle according to claim 1 or 2, wherein the cross-section of the capillary bore comprises a triangular cross-section (610) in a perpendicular direction relative the longitudinal direction of the microneedle.

4. A microneedle according to claim 3, wherein the triangular cross-section of the capillary bore further comprises at least one rounded corner (611).

5. A microneedle according to any preceding claim, wherein the capillary bore comprises a hydrophilic surface.

6. A microneedle according to any preceding claim, wherein the fluid channel is configured to provide an under-pressure, relative the atmospheric pressure, to the capillary bore, whereby fluid flow through the capillary bore is promoted.

7. A microneedle according to any preceding claims, wherein the elongated body further comprises a lateral hole from a side of the microneedle and extends in a radial direction relative the longitudinal direction, wherein the lateral hole is in fluid communication with the capillary hole.
- 5 8. A chip (115), comprising:
- a plurality of microneedles (101) integrally formed on a substrate (102), each microneedle comprising:
- an elongated body (503) extending from a distal end (504) thereof with a bevel (505) to a proximal end (506) thereof on the substrate along a longitudinal axis;
- 10 wherein the elongated body comprises a capillary bore (507) extending in a longitudinal direction thereof and defining a fluid path, wherein a cross-sectional area (610) of the capillary bore in the distal end is larger than the cross-sectional area of the capillary bore in the proximal end; and
- 15 wherein the proximal end is integrally formed with the substrate and the first fluid path is in fluid communication with a fluid channel (309) of the substrate.
9. A chip (115) according to claim 8, wherein the substrate comprises a fluid
- 20 channel which forms a fluid path, wherein the fluid channel has a width (W) larger than the depth (D) of the fluid channel.
10. A chip according to claim 8 or 9, wherein at least a part of a wall (916) of the capillary bore forms a part of a wall of the fluid channel (309).
11. A chip according to any of claims 8 to 10, wherein the fluid channel comprises
- 25 directional changes with an angle ( $\Theta$ ) smaller than 90 degrees.
12. A chip according to any of claims 8 to 11, further comprising a base substrate (413), which comprises a fluid port (414) in fluid communication with the fluid channel (309), and which opens in the backside of the base substrate.

13. A chip according to claim 12, wherein the fluid port comprises an increasing area in the longitudinal direction of the port towards the back of the base substrate.

5 14. A chip according to any of claims 8 to 13, wherein the base substrate (413) is operatively connected to the substrate (102) by means of bonding.

15. A chip according to any of claims 8 to 14, wherein the plurality of microneedles (101) are surrounded by an edge (117) which is in level with the distal end of the microneedles.