CLAIMS

1. A method of preparing an implant (70) comprising a culture of cells (73) on a membrane (34), the method comprising the steps of: fixing the membrane on a support (30), disposing the support in a housing recess (16) of a housing (10) leaving two spaces (38, 39) having adjusted heights, above and below the membrane, injecting into the spaces a liquid capable of transforming into gel at a temperature of transport below an injection temperature of the liquid, and bring the housing to the transport temperature, so as to form an implant comprising the membrane and two layers of gel (71, 72) having adjusted thicknesses, respectively on two opposite faces of the membrane.

2. Method according to claim 1, comprising a step of cutting the implant (70) in the membrane (34) and the two layers of gel (71, 72), the membrane being fixed to the support (30) and disposed in the housing recess (16).

3. Method according to one of claims 1 and 2, comprising a step of closing the housing recess (16) of the housing (10) receiving the membrane by an extraction cover (50), the extraction cover being configured to receive and guide a cutting tool (60) configured to cut the implant (70) in the membrane (34) and the two layers of gel (71, 72).

4. Method according to one of claims 1 to 3, wherein the implant (70) has an asymmetrical shape.

5. Method according to one of claims 1 to 4, wherein the spaces (38, 39) above and below the membrane (34) are formed between the bottom of the housing recess (16) and a preparation cover (20) suitable for closing the housing recess.

6. Method according to claim 5, comprising a step of replacing the preparation cover (20) by a transport cover (40) closing the housing recess (16) in a sealed manner, when the liquid injected into the housing recess is gel polymerized.

7. Method according to one of claims 1 to 6, in which the liquids injected into the upper (38) and lower (39) spaces are different, so that the upper gel layer (71) is less rigid than the layer lower gel (72).

8. Method according to one of claims 1 to 7, in which the cells arranged on the membrane are derived from pluripotent stem cells, from multipotent adult stem cells or else are derived from primary cultures or cell lines, or else correspond to a cell type of the implantation area, or are simple epithelial cells of different subtypes, such as photoreceptors, ganglion cells, bipolar cells, amacrine cells, retinal pigment epithelial cells, endothelial cells .

9. Device for preparing an implant from a cell culture on a membrane, the device comprising: a support (30) holding the membrane (34), a housing (10) comprising a housing recess (16) for receiving the support associated with the membrane, the housing providing two spaces (38, 39) having adjusted heights, above and below the membrane, and a two filling orifices (18,

28) for injecting liquid into the two spaces , the liquid being capable of transforming into a gel at a transport temperature below an injection temperature of the liquid, the device being configured to implement the method according to one of claims 1 to 8.

10. Device according to claim 9, further comprising a preparation cover (20) configured to close the housing recess (16) with the support (30), the preparation cover delimiting with the membrane (34) the upper space (38), the lower space (39) being delimited by the bottom of the housing recess and the membrane, the preparation cover comprising a filling orifice (28) opening into the upper space, the housing comprising a filling orifice (18) opening into the lower space.

11. Device according to claim 9 or 10, comprising a transport cover (40) provided to close the housing (16) in a sealed manner.

12. Device according to one of claims 9 to 11, comprising an extraction cover (50) provided to close the housing recess (16) and comprising a tubular extension (56) for the passage of a cutting tool (60) configured to cut a piece of the membrane (34) including cultured cells, the cut piece of membrane forming the implant (70).

13. Device according to one of Claims 9 to 12, comprising at least one of the following characteristics:

the two spaces (38, 39) have a height of between 0.05 and 0.2 mm, or else between 0.13 and 0.17 mm,

the implant (70) has an area of between 10 and 20 mm^2,

the membrane (34) is an amniotic membrane, or a Bruch's membrane, or a basal membrane, or a matrix of protein fibers such as collagen and / or fibrin fibers or a membrane made of a biocompatible synthetic material, biodegradable or not,

the liquid turning into gel is a natural or synthetic biocompatible hydrogel, which is liquid at the internal temperature of the human body,

the membrane support (30) has a truncated cone shape with a large opening and a small opening, the membrane being attached on the support so as to close the small opening, the cell culture being carried out on one face of the membrane disposed inside the support, and

the cutting tool (60) configured to cut a piece of membrane of asymmetric shape.

14. Use of the device according to one of claims 9 to 13, for producing an implant of cells cultured on a membrane (34).