Patent Claims:

1. Medical microelectrode for implantation into soft tissue of a person or animal resistant to displacement in the tissue by inertia, the electrode having a front end, a rear end and a density at 20 °C of from 0.80 to 1.15, in particular from 0.90 to 1.07, more particularly from 0.95 to 1.03, comprising any of:

an electrically conductive tubiform lead comprising or consisting of a metal and/or an electrically conductive polymer, the lead having an outer face and a sealed lumen;

an electrically conductive wire lead comprising or consisting of a metal and/or an electrically conductive polymer, the lead having a surface and a buoyant element of a density of less than 1.0 attached to the surface;

wherein a portion of the outer surface or the surface, respectively, is electrically insulated.

2. The electrode of claim 1, wherein the density is 0.99 ± 0.02.

3. The electrode of claim 1, wherein the lumen is void.

4. The electrode of claim 1, wherein the lumen comprises one or more sections filled with filler and optionally one or more void sections.

5. The electrode of claim 4, wherein the density of the filler is 0.8 or less, in particular 0.6 or less.

6. The electrode of claim 4, wherein the filler comprises a porous material.

7. The electrode of claim 4, wherein the filler comprises a polymer.

8. The electrode of claim 7, wherein the polymer is flexible, in particular resiliently flexible.

9. The electrode of claim 7, wherein the polymer comprises closed pores.

10. The electrode of claim 9, wherein the density at 20 °C of the polymer is less than 0.8, preferably less than 0.6.

11. The electrode of claim 1, wherein the buoyant element comprises a polymer comprising closed pores.

12. The electrode of claim 11, wherein the density at 20 °C of the polymer is less than 0.8, preferably less than 0.6.

13. The electrode of claim 11, wherein the polymer is flexible, in particular resiliently flexible.

14. The electrode of claim 1 fully or partially embedded in a matrix dissolvable or degradable in a body fluid.

15. The electrode of claim 1 comprising an electronic amplifying means and/or a microprocessor means, with the proviso that the combination of electrode and electronic amplifying/microprocessor means has a density at 20 °C of from 0.80 to 1.15, in particular from 0.90 to 1.07, more particularly from 0.95 to 1.03.

16. The electrode of claim 15, wherein the density is 0.99 ± 0.02.

17. The electrode of claim 15, wherein the electronic amplifying/microprocessor means is disposed at or near the rear end.

18. The electrode of claim 1 attached at or near its rear end to an ultra-thin insulated wire for electric communication with an electronic amplifying/microprocessor means disposed at a distance therefrom.

19. The electrode of claim 18, wherein the ultra-thin insulated wire is integral with the electrode wire.

20. The electrode of claim 15, wherein said electronic amplifying/microprocessor means is disposed in soft tissue of said person or animal.

21. The electrode of claim 15, wherein said electronic amplifying/microprocessor means comprises a source of electric energy.

22. The electrode of claim 15, wherein said electronic amplifying/microprocessor means comprises a means for transmitting and/or receiving radiation to/from a control unit disposed externally of said patient or animal.

23. The electrode of claim 1, comprising anchoring means disposed at or near its front end.

24. An electrode bundle comprising two or more electrodes of any of claims 1-23.

25. The electrode bundle of claim 24 partially or fully enclosed in a material dissolvable or degradable in a body fluid.

26. An electrode array comprising two or more electrodes of any of claims 1-23.

An electrode array comprising two or more electrode bundles of claim 24 or 25.

27. The electrode array of claim 26 partially or fully enclosed in a material dissolvable or degradable in a body fluid.

28. The electrode array of claim 27 partially or fully enclosed in a material dissolvable or degradable in a body fluid.

29. The electrode of any of claims 1–23, the electrode bundle of any of claims 24-25 or the electrode array of any of claims 26-29 comprising a sealed porous material.

CLAIMS

1. Medical microelectrode for implantation into soft tissue of a person or animal resistant to displacement in the tissue by inertia, the electrode having a front end, a rear end and a density at 20°C of from 0.95 to 1.03, comprising any of:
an electrically conductive tubiform lead comprising or consisting of a metal and/or an electrically conductive polymer, the lead having an outer face and a sealed lumen;
an electrically conductive wire lead comprising or consisting of a metal and/or an electrically conductive polymer, the lead having a surface and a buoyant element of a density of less than 1.0 attached to the surface;
wherein a portion of the outer surface or the surface, respectively, is electrically insulated.

2. The electrode of claim 1, wherein the density is 0.99 ± 0.02.

3. The electrode of claim 1, wherein the lumen is void.

4. The electrode of claim 1 or 2, wherein the lumen comprises one or more sections filled with filler and optionally one or more void sections.

5. The electrode of claim 4, wherein the density of the filler is 0.8 or less, in particular 0.6 or less.

6. The electrode of claim 4 or 5, wherein the filler comprises a porous material.

7. The electrode of claim 4 or 5, wherein the filler comprises a polymer.

8. The electrode of claim 7, wherein the polymer is flexible, in particular resiliently flexible.

9. The electrode of claim 7, wherein the polymer comprises closed pores.

10. The electrode of claim 9, wherein the density at 20°C of the polymer is less than 0.8, preferably less than 0.6.

11. The electrode of claim 1 or 2, wherein the buoyant element comprises a polymer comprising closed pores.

12. The electrode of claim 11, wherein the density at 20 °C of the polymer is less than 0.8, preferably less than 0.6.

13. The electrode of claim 11 or 12, wherein the polymer is flexible, in particular resiliently flexible.

14. The electrode of claims 1-13 fully or partially embedded in a matrix dissolvable or degradable in a body fluid.

15. The electrode of any one of claims 1-14 comprising an electronic amplifying means and/or a microprocessor means, with the proviso that the combination of electrode and electronic amplifying/microprocessor means has a density at 20 °C of from 0.95 to 1.03.

16. The electrode of claim 15, wherein the density is 0.99 ± 0.02.

17. The electrode of claim 15 or 16, wherein the electronic amplifying/microprocessor means is disposed at or near the rear end.

18. The electrode of any of claims 1-14 attached at or near its rear end to an ultra-thin insulated wire for electric communication with an electronic amplifying/microprocessor means disposed at a distance therefrom.

19. The electrode of claim 18, wherein the ultra-thin insulated wire is integral with the electrode wire.

20. The electrode of any of claims 15-19, wherein said electronic amplifying/microprocessor means is disposed in soft tissue of said person or animal.

21. The electrode of any of claims 15-20, wherein said electronic amplifying/microprocessor means comprises a source of electric energy.

22. The electrode of any of claims 15-21, wherein said electronic amplifying/microprocessor means comprises a means for transmitting and/or receiving radiation to/from a control unit disposed externally of said patient or animal.

23. The electrode of any of claims 1-22, comprising anchoring means disposed at or near its front end.

24. An electrode bundle comprising two or more electrodes of any of claims 1-23.

25. An electrode array comprising two or more electrodes of any of claims 1-23.

26. An electrode array comprising two or more electrode bundles of claim 24.

27. The electrode bundle of claim 24 or electrode array of claim 25 or 26 partially or fully enclosed in a material dissolvable or degradable in a body fluid.

28. The electrode of any one of claims 1-23 or the electrode bundle of any one of claims 24 and 27 or the electrode array of any one of claims 25-27 comprising a sealed porous material.