

IN THE CLAIMS

Please amend the claims as follows:

Claim 1. (Currently Amended) A flexible, thin film, compliant electrode apparatus, comprising:

a biocompatible, compliant dielectric having a top edge defined by a top and a side along a length of the dielectric;

electrical traces within the dielectric and oriented substantially along the length of the dielectric, a respective electrical trace of the electrical traces insulated from a second electrical trace of the electrical traces; and

electrode contacts situated on the side along the length of the dielectric,

wherein the electrical contacts are confined to a side edge along the length of the dielectric, and

wherein an exposed portion of a respective electrode contact is entirely below the top edge of the dielectric and is beyond the side edge along the length of the dielectric, and wherein the respective electrode contact is coupled to the respective electrical trace,

wherein a bottom of the exposed portion of the respective electrode contact is covered with a dielectric base.

Claim 2. (Previously Presented) The compliant electrode apparatus of claim 1, further comprising:

a reference electrode configured to read a reference signal from a fluid in a biological tissue, the reference electrode connected with one of the electrical traces, wherein the reference electrode is communicatively coupled to a processor configured to read the reference signal.

Claim 3. (Original) The compliant electrode apparatus of claim 1, wherein the electrode contacts include between 20 and 50 electrode contacts spaced along the length of the dielectric by between 45 micrometers and 55 micrometers center-on-center spacing, and wherein an area of each electrode contact is less than 350 square micrometers.

Claim 4. (Previously Presented) The compliant electrode apparatus of claim 1, wherein the electrode contact has a substantially oval shape.

Claim 5. (Previously Presented) The compliant electrode apparatus of claim 1, wherein the dielectric comprises polyimide, and the electrical traces and the electrode contacts comprise gold or another metal.

Claim 6. (Previously Presented) The compliant electrode apparatus of claim 1, wherein the dielectric comprises one or more of:
epoxy;
polyparaxylylene;
parylene; and
acrylic.

Claim 7. (Original) The compliant electrode apparatus of claim 1, further comprising:
an engagement component coupled to an end of the dielectric for detachably coupling to an insertion needle.

Claim 8. (Original) The compliant electrode apparatus of claim 1, wherein a thickness of the dielectric is between 4 micrometers and 8 micrometers, and wherein the length of the dielectric is between 15 millimeters and 25 millimeters.

Claim 9. (Cancelled).

Claims 10-29. (Canceled).

Claim 30. (Previously Presented) The compliant electrode apparatus of claim 1, wherein the electrical contacts are implanted in a brain at a depth of approximately two millimeters.

Claim 31. (Previously Presented) The compliant electrode apparatus of claim 1, wherein the electrode contacts comprise gold treated with poly-ethylenedioxythiophene doped with polystyrene sulfonate (PEDOT:PSS).

Claim 32. (Previously Presented) The compliant electrode apparatus of claim 1, wherein the electrode contacts comprise gold electrode treated with iridium oxide.

Claim 33. (Previously Presented) The compliant electrode apparatus of claim 1, wherein the electrode contacts have rectangular cross-sections.

Claim 34. (Withdrawn) The compliant electrode apparatus of claim 1, wherein the compliant electrode apparatus is one of a plurality of compliant electrode apparatuses forming an array of more than 3,000 electrodes.

Claim 35. (Previously Presented) The compliant electrode apparatus of claim 1, wherein the compliant electrode apparatus is deposited onto parylene-c to form a film on which the electrode apparatus remains attached until removed for implantation.

Claim 36. (Currently Amended) The compliant electrode apparatus of claim 1, wherein the biocompatible compliant dielectric is a partial dielectric cover ~~and the compliant electrode apparatus further comprises a dielectric base.~~

Claim 37. (Currently Amended) The compliant electrode apparatus of claim 36, wherein the respective electrode contact is below ~~[[a]]~~ the top edge of the partial dielectric cover but entirely above a top edge of the dielectric base.