

CLAIMS

1. An electro-conductive embedding medium for a biological sample comprising:
 - from 60% to 99% wt. of a glycol dimethacrylate selected from alkylene glycol dimethacrylate and/or oligo(alkylene glycol) dimethacrylate;
 - a polyalkylene glycol diacrylate or of a polyalkylene glycol methacrylate; said polyalkylene glycol diacrylate or polyalkylene glycol methacrylate being optionally substituted by at least one hydrophilic group such as hydroxyl, amino, or an oxo group;
 - at least one additive, preferably comprising at least one heavy metal salt or lanthanide salt; and
 - a radical polymerization initiator.
2. The electro-conductive embedding medium according to claim 1, wherein the glycol dimethacrylate is selected from ethylene glycol dimethacrylate, diethylene glycol dimethacrylate, triethylene glycol dimethacrylate, propylene glycol dimethacrylate and butylene glycol dimethacrylate; preferably the glycol dimethacrylate is triethylene glycol dimethacrylate.
3. The electro-conductive embedding medium according to claim 1 or claim 2, wherein the polyalkylene glycol diacrylate is selected from polyethylene glycol diacrylate, polypropylene glycol diacrylate and polybutylene glycol diacrylate; preferably the polyalkylene glycol diacrylate is polypropylene glycol diacrylate.
4. The electro-conductive embedding medium according to any one of claims 1 to 3, wherein the polyalkylene glycol methacrylate is selected from polyethylene glycol methacrylate, polypropylene glycol methacrylate and polybutylene glycol methacrylate; said polyalkylene glycol methacrylate being optionally substituted by at least one hydrophilic group such as hydroxyl, amino, or an oxo group; preferably the polyalkylene glycol methacrylate is hydroxyl polyethylene glycol methacrylate.
5. The electro-conductive embedding medium according to any one of claims 1 to 4, comprising:

- from 60% to 99% wt. of triethylene glycol dimethacrylate;
 - from more than 0% to 38% wt. of polypropylene glycol diacrylate; and
 - from 0.1% to 2% wt. of a radical polymerization initiator.
- 5 **6.** The electro-conductive embedding medium according to any one of claims **1** to **4**, comprising:
- from 60% to 99% wt. of triethylene glycol dimethacrylate;
 - from more than 0% to 38% wt. of hydroxyl polyethylene glycol methacrylate; and
 - from 0.1% to 2% wt. of a radical polymerization initiator.
- 10 **7.** The electro-conductive embedding medium according to any one of claims **1** to **4**, comprising:
- 79% wt. of triethylene glycol dimethacrylate;
 - 20% wt. of polypropylene glycol diacrylate; and
 - 1% wt. of benzoin methyl ether.
- 15 **8.** The electro-conductive embedding medium according to any one of claims **1** to **7**, wherein the at least one additive, is at least one heavy metal salt, more preferably comprising osmium and/or uranyl acetate.
- 20 **9.** The electro-conductive embedding medium according to any one of claims **1** to **8**, further comprising at least one biological sample, preferably a vitrified and/or chemically fixed and/or dehydrated biological sample.
- 10.** An electro-conductive imaging material comprising at least one biological sample embedded in a polymer matrix resulting from the polymerization of the embedding medium according to any one of claims **1** to **9**.
- 25 **11.** The electro-conductive material according to claim **10**, preserving the internal fluorescence, the protein activity and/or the antigenic specificity of the embedded biological sample.
- 12.** A method for imaging by microscopy a biological sample comprising the following steps:

- (i-1) fixing and/or dehydrating the biological sample;
 - (ii) infiltrating on the biological sample of step (i-1) an electro-conductive embedding medium according to any one of claims **1** to **9**;
 - (iii) polymerizing the mixture obtained at step (ii), resulting in an electro-conductive imaging material;
 - (iv) imaging by light microscopy and/or electron microscopy the electro-conductive imaging material of step (iii).
- 13.** The method according to claim **12**, further comprising a step of microtomy or ultra-microtomy on the electro-conductive imaging material.
- 14.** Use of an electro-conductive embedding medium according to any one of claims **1** to **9**, or of an electro-conductive imaging material according to claim **10** or claim **11**, for imaging a biological sample by microscopy, preferably by light and/or electron microscopy.
- 15.** A kit for preparing a biological sample to be imaged in microscopy, comprising:
- a first container comprising (a) a glycol dimethacrylate selected from alkylene glycol dimethacrylate and/or oligo(alkylene glycol) dimethacrylate; and (b) a polyalkylene glycol diacrylate or a polyalkylene glycol methacrylate, said polyalkylene glycol diacrylate or polyalkylene glycol methacrylate being optionally substituted by at least one hydrophilic group such as hydroxyl, amino, or an oxo group;
 - a second container comprising radical polymerization initiator;
- or comprising:
- a container comprising (a) an glycol dimethacrylate selected from alkylene glycol dimethacrylate and/or oligo(alkylene glycol) dimethacrylate; (b) a polyalkylene glycol diacrylate or a polyalkylene glycol methacrylate, said polyalkylene glycol diacrylate or polyalkylene glycol methacrylate being optionally substituted by at least one hydrophilic group such as hydroxyl, amino, or an oxo group; and (c) a radical polymerization initiator;
- and mixing means.