Claims

1. Medical device carrying at least on a portion of its surface at least one drug and at least one lipophilic lubricant at a ratio of 0.1-500% by weight of the at least one lipophilic lubricant in relation to 100% by weight of the drug, wherein the at least one drug is selected from paclitaxel, arsenic trioxide, lipophilic derivatives of corticoids and sirolimus, everolimus, zotarolimus, biolimus, temsirolimus and the at least one lipophilic lubricant is a C_6-C_{30}-monocarboxylic acid salt and the at least one drug and the at least one lubricant are applied at the same time in the same solvent or mixture of solvents or the drug-coated device is coated with an additional layer of the at least one lubricant.

2. Medical device according to claim 1 wherein the C_6-C_{30}-monocarboxylic acid salt is a magnesium, calcium, zinc or ammonium salt.

3. Medical device according to claim 1 wherein the C_6-C_{30}-monocarboxylic acid salt is a salt of a monovalent organic base.

4. Medical device according to claim 1 or 2, wherein the C_6-C_{30}-monocarboxylic acid salt is selected from magnesium stearate, calcium stearate, zinc stearate, magnesium palmitate, calcium palmitate, zinc palmitate, magnesium myristate, calcium myristate, magnesium laurate, calcium laurate, magnesium caprinate, calcium caprinate, magnesium caprylate, calcium caprylate, magnesium oleate, calcium oleate, magnesium palmitoleate or calcium palmitoleate.

5. Medical device according to any one of claims 1-4, wherein the C_6-C_{30}-monocarboxylic acid salt is admixed to one or more components selected from stearic acid, palmitic acid, lauric acid, capric acid, caprylic acid, oleic acid, palmitoleic acid, stearic alcohol, palmitic alcohol, lauric alcohol, magnesium acetate and calcium acetate.

6. Medical device according to any one of claims 1-5, wherein the device is an angioplasty balloon catheter for short use, preferably during an imaging-guided intervention.

7. Medical device according any one of claims 1-6, wherein the at least one lipophilic lubricant is contained at a ratio of 0.1-500% by weight, preferably at a ratio of 1-200% by weight, more preferred at a ratio of 1-100% by weight, and even more preferred at a ratio of 2 – 75% by weight and most preferred at a ratio of 2 – 50% by weight in relation to 100% by weight of the at least one drug.

8. Medical device according to any one of claims 1-7, wherein the at least one drug is more lipophilic than the at least one lipophilic lubricant.

9. Medical device according to any one of claims 1-8, wherein the at least one drug is sirolimus.

10. Medical device according to any one of claims 1-8, wherein the lipophilic derivative of a corticoid is selected from betamethasone dipropionat or dexamethasone-21-palmitate.

11. Medical device according to any one of claims 1-10, wherein the at least one drug is natural, semi-synthetic or synthetic, preferably semi-synthetic or synthetic.

12. Medical device according to any one of claims 1-11, wherein the lipophilic lubricant load is up to 10 µg/mm² of coated device surface.

13. Medical device according to any one of claims 1-12, which has been coated with at least one drug and at least one lipophilic lubricant either both together dissolved in tetrahydrofuran or a mixture of solvents containing more than 25% (v/v) tetrahydrofuran or each separately dissolved optionally selecting a different solvent or mixture thereof for the at least one lipophilic lubricant from acetone, acetic acid, water and alcohols.

14. Medical device according to any one of claims 1-13, which has been coated with at least one drug and at least one lipophilic lubricant both together dissolved in acetone or a mixture of solvents containing more than 25% (v/v) acetone or each separately dissolved, optionally selecting a different solvent or mixture thereof for the at least one lipophilic lubricant from tetrahydrofuran, acetic acid, water and alcohols.

15. Medical device according to any one of claims 1-13, which has been coated with at least one drug and at least one lipophilic lubricant either both together dissolved in isopropanol or a mixture of solvents containing more than 25% (v/v) isopropanol or each separately dissolved optionally selecting a different solvent or mixture thereof for the at least one lipophilic lubricant from acetone, tetrahydrofuran, acetic acid, water and other alcohols.

16. Medical device according to any one of claims 1-15, which has been coated with at least one drug and at least one lipophilic lubricant either both together dissolved in a solvent or a mixture of solvents, or each separately dissolved optionally selecting a different solvent for the at least one drug, wherein the solvent or mixture of solvents additionally contains more than 0.01-25% (v/v) acetic acid or formic acid.

17. Medical device according to any one of claims 1-12, which has been sequentially coated first with at least one drug and thereafter with at least one lipophilic lubricant in a way that the drug and the lubricant are not homogeneously mixed.

18. Medical device according to claims 1-17, which has been coated with at least one drug and at least one lubricant plus at least one additional excipient.

19. Medical device according to claim 18, wherein the additional excipient is an antioxidant.

The invention claimed is:

1. A medical device carrying at least on a portion of its surface at least one drug and at least one lipophilic lubricant at a ratio of 0.1%-500% by weight of the at least one lipophilic lubricant in relation to 100% by weight of the drug, wherein the at least one drug is selected from the group consisting of paclitaxel, arsenic trioxide, lipophilic derivatives of corticoids, sirolimus, everolimus, zotarolimus, biolimus, temsirolimus, the at least one lipophilic lubricant is a C_6-C_{30}-monocarboxylic acid salt, and the at least one drug and the at least one lubricant are applied at the same time in the same solvent or mixture of solvents or the drug-coated device is coated with an additional layer of the at least one lubricant.

2. The medical device according to claim 1, wherein the C_6-C_{30}-monocarboxylic acid salt is a magnesium, calcium, zinc, or ammonium salt.

3. The medical device according to claim 1, wherein the C_6-C_{30}-monocarboxylic acid salt is a salt of a monovalent organic base.

4. The medical device according to claim 1, wherein the C_6-C_{30}-monocarboxylic acid salt is selected from the group consisting of magnesium stearate, calcium stearate, zinc stearate, magnesium palmitate, calcium palmitate, zinc palmitate, magnesium myristate, calcium myristate, magnesium laurate, calcium laurate, magnesium caprinate, calcium caprinate, magnesium caprylate, calcium caprylate, magnesium oleate, calcium oleate, magnesium palmitoleate, and calcium palmitoleate.

5. The medical device according to claim 1, wherein the C_6-C_{30}-monocarboxylic acid salt is admixed to one or more components selected from the group consisting of stearic acid, palmitic acid, lauric acid, capric acid, caprylic acid, oleic acid, palmitoleic acid, stearic alcohol, palmitic alcohol, lauric alcohol, magnesium acetate, and calcium acetate.

6. The medical device according to claim 1, wherein the device is an angioplasty balloon catheter for short use.

7. The medical device according to claim 1, wherein the at least one drug is more lipophilic than the at least one lipophilic lubricant.

8. The medical device according to claim 1, wherein the at least one drug is sirolimus.

9. The medical device according to claim 1, wherein the lipophilic derivative of a corticoid is selected from betamethasone dipropionate or dexamethasone-21-palmitate.

10. The medical device according to claim 1, wherein a lipophilic lubricant load is up to 10 $\mu g/mm^2$ of coated device surface.

11. The medical device according to claim 1, which has been coated with at least one drug and at least one lipophilic lubricant either both together dissolved in tetrahydrofuran or a mixture of solvents containing more than 25% (v/v) tetrahydrofuran or each separately dissolved optionally selecting a different solvent or mixture thereof for the at least one lipophilic lubricant from the group consisting of acetone, acetic acid, water, and alcohols.

12. The medical device according to claim 1, which has been coated with at least one drug and at least one lipophilic lubricant both together dissolved in acetone or a mixture of solvents containing more than 25% (v/v) acetone or each separately dissolved, optionally selecting a different solvent or mixture thereof for the at least one lipophilic lubricant from the group consisting of tetrahydrofuran, acetic acid, water, and alcohols.

13. The medical device according to claim 1, which has been coated with at least one drug and at least one lipophilic lubricant either both together dissolved in isopropanol or a mixture of solvents containing more than 25% (v/v) isopropanol or each separately dissolved optionally selecting a different solvent or mixture thereof for the at least one lipophilic lubricant from the group consisting of acetone, tetrahydrofuran, acetic acid, water, and alcohols other than isoproponal.

14. The medical device according to claim 1, which has been coated with at least one drug and at least one lipophilic lubricant either both together dissolved in a solvent or a mixture of solvents, or each separately dissolved optionally selecting a different solvent for the at least one drug, wherein the solvent or mixture of solvents additionally contains more than 0.01%-25% (v/v) acetic acid or formic acid.

15. The medical device according to claim 1, which has been sequentially coated first with at least one drug and thereafter with at least one lipophilic lubricant in a way that the drug and the lubricant are not homogeneously mixed.

16. The medical device according to claim 1, which has been coated with at least one drug and at least one lubricant plus at least one additional excipient.

17. The medical device according to claim 16, wherein the additional excipient is an antioxidant.

18. The medical device according to claim 1, wherein the at least one lipophilic lubricant is contained at a ratio of 1%-200% by weight in relation to 100% by weight of the at least one drug.

19. The medical device according to claim 1, wherein the at least one lipophilic lubricant is contained at a ratio of 1%-100% by weight in relation to 100% by weight of the at least one drug.

20. The medical device according to claim 1, wherein the at least one lipophilic lubricant is contained at a ratio of 2%-75% by weight in relation to 100% by weight of the at least one drug.

21. The medical device according to claim 1, wherein the at least one lipophilic lubricant is contained at a ratio of 2%-50% by weight in relation to 100% by weight of the at least one drug.

22. The medical device according to claim 1, wherein the at least one drug is semi-synthetic, or synthetic.

23. The medical device according to claim 1, wherein the at least one drug is natural.