CLAIMS

1. Therapeutic molecule with chemical structure of COMPOUND I:

$$A1_m ((-L9_w) ((- L1_q - B1_n)_u ((- L2_r - L3_s) (- L4_v - C)_p)_t))_x$$

(compound I),

wherein

A1 is a first ligand and B1 is a first effector moiety;

C is a saponin, wherein the saponin C is a bisdesmosidic triterpene saponin, belonging to the type of a 12,13-dehydrooleanane with an aldehyde function in position C-23 and optionally comprising a glucuronic acid function in a carbohydrate substituent at the C-3beta-OH group of the saponin;

m = 1;

n = 1;

p = any of 1-128;

L1 is at least one linker for covalently coupling two chemical groups;

L2 is at least one linker for covalently coupling two chemical groups;

L3 is at least one oligomeric or polymeric scaffold for covalently coupling two chemical groups;

L4 is at least one linker for covalently coupling two chemical groups;

L9 is a tri-functional linker for covalently coupling three chemical groups;

q = 0 or 1;

r = 0;

s = 0;

t = 1 or 2;

u = any of 0 – 32 if A1 is the first ligand and B1 is the first effector moiety;

v = 0 or 1;

w = 1 or 0; and

x = 1-16;

wherein said therapeutic molecule comprises a first ligand and at least one first effector moiety and further comprises at least one covalently bound saponin, wherein the first effector moiety is a pharmaceutically active substance and consists of at least one proteinaceous molecule, wherein said first ligand consists of an immunoglobulin, a binding domain of an immunoglobulin or a binding fragment of an immunoglobulin, such as an antibody, an IgG, a molecule comprising or consisting of a Vhh domain or Vh domain, a Fab, an scFv, an Fv, a dAb, an $F(ab)_2$, Fcab fragment.

2. Therapeutic molecule of claim 1, wherein the first ligand binds to a tumor-cell epitope, preferably a tumor-cell specific epitope, of a tumor-cell receptor, preferably a tumor-cell specific receptor, preferably selected from CD71, CA125, EpCAM(17-1A), CD52, CEA, CD44v6, FAP, EGF-IR, integrin, syndecan-

1, vascular integrin alpha-V beta-3, HER2, EGFR, CD20, CD22, Folate receptor 1, CD146, CD56, CD19, CD138, CD27L receptor, PSMA, CanAg, integrin-alphaV, CA6, CD33, mesothelin, Cripto, CD3, CD30, CD239, CD70, CD123, CD352, DLL3, CD25, ephrinA4, MUC1, Trop2, CEACAM5, CEACAM6, HER3, CD74, PTK7, Notch3, FGF2, C4.4A, FLT3, CD38, FGFR3, CD7, PD-L1, CTLA4, CD52, PDGFRA, VEGFR1, VEGFR2, more preferably selected from CD71, EGFR and HER2.

3. Therapeutic molecule of any one of the claims 1-2, wherein the first ligand comprises or consists of cetuximab, daratumumab, gemtuzumab, trastuzumab, panitumumab, brentuximab, inotuzumab, moxetumomab, polatuzumab, obinutuzumab, OKT-9 anti-CD71 monoclonal antibody of the IgG type, pertuzumab, rituximab, ofatumumab, Herceptin, alemtuzumab, pinatuzumab, OKT-10 anti-CD38 monoclonal antibody, an antibody of Table A2 or Table A3 or Table A4, preferably cetuximab or trastuzumab or OKT-9, or at least one tumor-cell receptor binding-domain thereof and/or at least one tumor-cell receptor binding-fragment thereof which are preferably (a) tumor-cell specific receptor binding-domain(s) and/or (a) tumor-cell specific receptor binding-fragment(s),.

4. Therapeutic molecule of any one of the claims 1-3, wherein the first effector moiety consists of at least one of any one or more of an oligonucleotide, a nucleic acid and a xeno nucleic acid, preferably selected from any one or more of a vector, a gene, a cell suicide inducing transgene, deoxyribonucleic acid (DNA), ribonucleic acid (RNA), anti-sense oligonucleotide (ASO, AON), short interfering RNA (siRNA), microRNA (miRNA), DNA aptamer, RNA aptamer, mRNA, mini-circle DNA, peptide nucleic acid (PNA), phosphoramidate morpholino oligomer (PMO), locked nucleic acid (LNA), bridged nucleic acid (BNA), 2’-deoxy-2’-fluoroarabino nucleic acid (FANA), 2’-O-methoxyethyl-RNA (MOE), 2'-O,4'-aminoethylene bridged nucleic acid, 3’-fluoro hexitol nucleic acid (FHNA), a plasmid, glycol nucleic acid (GNA) and threose nucleic acid (TNA), or a derivative thereof, more preferably a BNA, for example a BNA for silencing HSP27 protein expression.

5. Therapeutic molecule of any one of the claims 1-4, wherein the first effector moiety is selected from any one or more of a peptide, a protein, an enzyme such as urease and Cre-recombinase, a proteinaceous toxin, a ribosome-inactivating protein, at least one protein toxin selected from Table A5 and/or a bacterial toxin, a plant toxin, more preferably selected from any one or more of a viral toxin such as apoptin; a bacterial toxin such as Shiga toxin, Shiga-like toxin, Pseudomonas aeruginosa exotoxin (PE) or exotoxin A of PE, full-length or truncated diphtheria toxin (DT), cholera toxin; a fungal toxin such as alpha-sarcin; a plant toxin including ribosome-inactivating proteins and the A chain of type 2 ribosome-inactivating proteins such as dianthin e.g. dianthin-30 or dianthin-32, saporin e.g. saporin-S3 or saporin-S6, bouganin or de-immunized derivative debouganin of bouganin, shiga-like toxin A, pokeweed antiviral protein, ricin, ricin A chain, modeccin, modeccin A chain, abrin, abrin A chain, volkensin, volkensin A chain, viscumin, viscumin A chain; or an animal or human toxin such as frog RNase, or granzyme B or angiogenin from humans, or any fragment or derivative thereof; preferably the protein toxin is dianthin and/or saporin.

6. Therapeutic molecule of any one of the claims 1-5, wherein the therapeutic molecule comprises and/or consists of any one of Gemtuzumab ozogamicin, Brentuximab vedotin, Trastuzumab emtansine, Inotuzumab ozogamicin, Moxetumomab pasudotox and Polatuzumab vedotin and an antibody-drug conjugate of Table A2 and Table A3, or at least one tumor-cell specific receptor binding-domain thereof and/or at least one tumor-cell specific receptor binding-fragment thereof which are preferably (a) tumor-cell specific receptor binding-domain(s) and/or (a) tumor-cell specific receptor binding-fragment(s).

7. Therapeutic molecule of any one of the claims 1-6, wherein the saponin is a saponin isolated from *a Gypsophila* species and/or a *Saponaria* species and/or an *Agrostemma* species and/or a *Quillaja* species such as *Quillaja saponaria*.

8. Therapeutic molecule of any one of the claims 1-7, wherein the saponin is a single specific saponin or is a mixture of two or more different saponins, such as one or more of the saponins NP-005236, AMA-1, AMR, Alpha-hederin, NP-012672, NP-017777, NP-017778, NP-017774, NP-018110, NP-017772, NP-018109, NP-017888, NP-017889, NP-018108, AE X55, NP-017674, NP-017810, NP-003881, NP-017676, NP-017677, NP-017706, NP-017705, NP-017773, NP-017775, QS-17, QS-21 A-apio, QS-21 A-xylo, QS-21 B-apio, QS-21 B-xylo, beta-Aescin, Aescin Ia, Teaseed saponin I, Teaseedsaponin J, Assamsaponin F, Digitonin, Primula acid 1, AS64R, AS6.2, SO1861, SA1657, GE1741, SA1641, QS-21, QS-21A, QS-21 A-api, QS-21 A-xyl, QS-21B, QS-21 B-api, QS-21 B-xyl, QS-7-xyl, QS-7-api, QS-17-api, QS-17-xyl, QS1861, QS1862, Quillajasaponin, Saponinum album, QS-18, Quil-A, Gyp1, gypsoside A, AG1, AG2, SO1542, SO1584, SO1658, SO1674, SO1832, or any of their stereomers and/or any combinations thereof, preferably the saponin is SO1861 and/or GE1741 and/or SA1641 and/or QS-21 and/or saponin with a quillaic acid aglycon core, a Gal-(1→2)-[Xyl-(1→3)]-GlcA carbohydrate substituent at the C-3beta-OH group and a Glc-(1→3)-Xyl-(1→4)-Rha-(1→2)-[Xyl-(1→3)-4-OAc-Qui-(1→4)]-Fuc carbohydrate substituent at the C-28-OH group, and/or is 3-O-beta-D-galactopyranosyl-(1→2)-[beta-D-xylopyranosyl-(1→3)]-beta-D-glucuronopyranosyl quillaic acid 28-O-beta-D-glucopyranosyl-(1→3)-beta-D-xylopyranosyl-(1→4)- alpha-L-rhamnopyranosyl-(1→2)-[beta-D-xylopyranosyl-(1→3)-4-OAc-beta-D-quinovopyranosyl-(1→4)]-beta-D-fucopyranoside, more preferably the saponin is SO1861 and/or QS-21.

9. Therapeutic molecule of any one of the claims 1-8, wherein the saponin is a bisdesmosidic saponin having a molecular mass of at least 1.500 Dalton and comprising an oleanan-type triterpene containing an aldehyde group at the C-23 position and optionally a hydroxyl group at the C-16 position, with a first branched carbohydrate side chain at the C-3 position which first branched carbohydrate side chain optionally contains glucuronic acid, wherein the saponin contains an ester group with a second branched carbohydrate side chain at the C-28 position which second branched carbohydrate chain preferably comprises at least four carbohydrate units, optionally containing at least one acetyl residue such as two acetyl residues and/or at least one deoxy carbohydrates and/or a quinovose and/or a glucose and/or 4-methoxycinnamic acid and/or optionally comprising 5-O-[5-O-Ara/Api-3,5-dihydroxy-6-methyl-octanoyl]-3,5-dihydroxy-6-methyl-octanoic acid and/or optionally comprising 5-O-[5-O-Rha-(1→2)-Ara/Api-3,5-

dihydroxy-6-methyl-octanoyl]-3,5-dihydroxy-6-methyl-octanoic acid bound to a carbohydrate via an ester bond, or wherein the at least one saponin is QS-21 or any one or more of QS-21A, QS-21 A-api, QS-21 A-xyl, QS-21B, QS-21 B-api, QS-21 B-xyl, QS-7-xyl, QS-7-api, QS-17-api, QS-17-xyl, QS-18, QS1861, protonated QS1861 (QS1862), Quil-A.

10. Therapeutic molecule of any one of the claims 1-9, wherein the saponin is a bisdesmosidic triterpene saponin belonging to the type of a 12,13-dehydrooleanane with an aldehyde function in position C-23, wherein the saponin is covalently coupled to an amino-acid residue of the first ligand via the aldehyde function in the saponin, preferably said aldehyde function in position C-23, wherein the amino-acid residue preferably is selected from cysteine and lysine.

11. Therapeutic molecule of any one of the claims 1-10, wherein the saponin is a bisdesmosidic triterpene saponin belonging to the type of a 12,13-dehydrooleanane with an aldehyde function in position C-23, wherein the aldehyde function in position C-23 of the at least one saponin is covalently coupled to linker N-ε-maleimidocaproic acid hydrazide, which linker is covalently coupled via a thio-ether bond to a sulfhydryl group in the first ligand , such as a sulfhydryl group of a cysteine.

12. Therapeutic molecule of any one of the claims 1-11, wherein the saponin is a bisdesmosidic triterpene saponin belonging to the type of a 12,13-dehydrooleanane with an aldehyde function in position C-23 and comprising a glucuronic acid function in a carbohydrate substituent at the C-3beta-OH group of the saponin, wherein the saponin is covalently coupled to the amino-acid residue of the first ligand via the glucuronic acid function in the saponin, wherein the amino-acid residue preferably is selected from cysteine and lysine, more preferably the amino-acid residue is lysine.

13. Therapeutic molecule of any one of the claims 1-12, wherein the saponin is a bisdesmosidic triterpene saponin belonging to the type of a 12,13-dehydrooleanane with an aldehyde function in position C-23 and comprising a glucuronic acid function in a carbohydrate substituent at the C-3beta-OH group of the saponin, wherein the glucuronic acid function in the carbohydrate substituent at the C-3beta-OH group of the at least one saponin is covalently coupled to linker 1-[Bis(dimethylamino)methylene]-1H-1,2,3-triazolo[4,5-b]pyridinium 3-oxid hexafluorophosphate, which linker is covalently coupled via an amide bond to an amine group in the first ligand , such as an amine group of a lysine or an N-terminus of the first ligand .

14. Therapeutic molecule of any one of the claims 1-13, wherein the first ligand comprises one or more than one covalently bound saponin, preferably 2, 3, 4, 5, 6, 8, 10, 16, 32, 64, 128 or 1-100 saponins, or any number of saponins therein between, such as 7, 9, 12 saponins.

15. Therapeutic molecule of any one of claims 1-14, wherein the linker L4, L6, L8 and/or L9 is subject to cleavage under acidic conditions, reductive conditions, enzymatic conditions or light-induced conditions, and preferably the cleavable linker comprises a hydrazone bond or a hydrazide bond subject

to cleavage under acidic conditions when bound to saponin, and/or comprises a bond susceptible to proteolysis, for example proteolysis by Cathepsin B, when bound to saponin, and/or the cleavable linker comprises a disulphide bond susceptible to cleavage under reductive conditions.

16. Therapeutic molecule of any one of claims 1-13, wherein the cleavable linker L4, L6, L8 and/or L9 is subject to cleavage *in vivo* under acidic conditions as present in endosomes and/or lysosomes of mammalian cells, preferably human cells, preferably at pH 4.0 – 6.5, and more preferably at pH $\leq$ 5.5.

17. Therapeutic molecule of any one of the claims 15-16, wherein the at least one saponin is covalently bound to the first ligand via at least one linker such as a bi-functional linker, for example based on N-ε-maleimidocaproic acid hydrazide and/or based on 1-[Bis(dimethylamino)methylene]-1H-1,2,3-triazolo[4,5-b]pyridinium 3-oxid hexafluorophosphate.

18. Pharmaceutical composition comprising the therapeutic molecule with chemical structure of COMPOUND I according to any one of the claims 1-17 , for use as a medicament.