CLAIMS

1. A complex of a protein and a catalyst selected from metal catalysts ~~or organic catalysts~~, wherein

said protein is a protein that has a hydrophobic pocket within its three-dimensional structure, and

said complex accommodates said catalyst in said hydrophobic pocket so that said catalyst is not exposed or not substantially exposed to the hydrophilic environment;

said protein is a human serum albumin (HSA),

said hydrophobic pocket of human serum albumin is the albumin drug binding site I (drug site I),

said metal catalyst is bound to the said hydrophobic pocket via a ligand against human serum albumin, and

said ligand is coumarin.

~~2. The complex according to claim 1, wherein said protein is a natural or artificial protein.~~

~~3. The complex according to claim 1 or 2, wherein said protein is selected from the group consisting of human serum albumin (HSA), immunoglobulin G (IgG), immunoglobulin A (IgA), transferrin, antitrypsin, haptoglobin, α1-acidic glycoprotein, Myoferlin, Trk receptor, estrogen receptor, and folate receptor.~~

2~~4~~. The complex according to ~~any one of~~ claim 1~~ to 3~~, wherein said metal catalyst is selected from the group consisting of a boron catalyst, a magnesium catalyst, an aluminum catalyst, a silicon catalyst, a calcium catalyst, a scandium catalyst, a titanium catalyst, a vanadium catalyst, a chromium catalyst, a manganese catalyst, an iron catalyst, a cobalt catalyst, a nickel catalyst, a copper catalyst, a zinc catalyst, an yttrium catalyst, a zirconium catalyst, a niobium catalyst, a molybdenum catalyst, a ruthenium catalyst, a rhodium catalyst, a palladium catalyst, a silver catalyst, an indium catalyst, a tin catalyst, a barium catalyst, a hafnium catalyst, a tungsten catalyst, a rhenium catalyst, an osmium

catalyst, an iridium catalyst, a platinum catalyst, a gold catalyst, and a lanthanoid Lewis acid catalyst.

35. The complex according to claim 24, wherein said lanthanoid Lewis acid catalyst is selected from the group consisting of an ytterbium catalyst, a lanthanum catalyst, a cerium catalyst, a samarium catalyst, an europium catalyst, a gadolinium catalyst, a terbium catalyst, a thulium catalyst, and a lutetium catalyst.

~~6. The complex according to any one of claim 1 to 5, wherein~~
~~said protein is a human serum albumin, and~~
~~said catalyst is a metal catalyst.~~

47. The complex according to claim 16, wherein said metal catalyst is a ruthenium catalyst.

~~8. The complex according to claim 6 or 7, wherein said hydrophobic pocket of human serum albumin is the albumin drug binding site I (drug site I).~~

~~9. The complex according to any one of claim 6 to 8, wherein said metal catalyst is bound to the said hydrophobic pocket via a ligand against human serum albumin.~~

~~10. The complex according to claim 9, wherein said ligand is selected from the group consisting of warfarin, azapropazone, acenocoumarol, phenylbutazone, salicylate salt, indomethacin, phenytoin, tolbutamide, chlorpropamide, iophenoxate, iodipamide, sulfadimethoxine, phenprocoumon, glibenclamide, sulfathiazole, tenoxicam, camptothecin, prodan, bilirubin, eicosanoid, and carboxy-methyl-propyl-furanpropanoate (uremic toxin), and coumarin.~~

511. The complex according to claim 19 ~~or 10~~, wherein said metal catalyst is bound to the said hydrophobic pocket via a linker bound to said ligand.

612. The complex according to claim 511, wherein said linker is an alkyl chain or a polyethylene glycol (PEG) chain having amino and carboxyl groups on both ends.

713. The complex according to claim 612, wherein said linker is C_1 - C_3 alkyl.

814. The complex according to any one of claim 1 to 713, wherein the surface of said protein is modified so as to interact with a target site in vivo.

915. The complex according to claim 814, wherein said modification is a modification by a sugar chain.

1016. The complex according to any one of claim 1 to 713, wherein said protein further comprises a portion that interacts with a target site in vivo.

~~17. The complex according to claim 14 or 15, wherein said protein is human serum albumin.~~

1118. A composition comprising the complex according to any one of claim 1 to 1017.

1219. The composition according to claim 1118, which is a pharmaceutical composition further comprising a pharmaceutically acceptable carrier.

1320. The composition according to claim 1219, which is to be used in combination with a prodrug that can be activated by said complex.

1421. The composition according to claim 1219, further comprising a prodrug that can be activated by said complex.

~~22. The composition according to claim 19, which is employed for selectively tagging particular cells.~~

~~23. The composition according to claim 22, which is to be administered in combination with a chemical substance that is tagged to said cells.~~

~~24. The composition according to claim 18, which is used as a biosensor.~~

~~25. The composition according to claim 18, which is used as a biosensor for detecting ethylene.~~

15~~26~~. A pharmaceutical composition comprising a prodrug, wherein

said prodrug can be activated by the complex according to any one of claim 1 to 10~~17~~, and

said pharmaceutical composition is to be used in combination with the complex according to any one of claim 1 to 10~~17~~.

16~~27~~. A combination medicine comprising

a first agent comprising the complex according to any one of claim 1 to 10~~17~~, and

a second agent comprising a prodrug that can be activated by said complex.