Claims

1. A conjugate of a delivery agent comprising at least one flavonoid and a polymer comprising a free functional group for reacting with the flavonoid to form the conjugate, wherein the functional group is:

    a free amine group or a functional group capable of being converted to a amine group; or

    a free succinimide group or a functional group capable of being converted to a succinimide group;

    and the flavonoid exists in a monomeric form or dimeric form before conjugation and remains in the monomeric form or dimeric form after conjugation.

2. The conjugate of claim 1, comprising two flavonoids, wherein the first flavonoid does not undergo association with the second flavonoid.

3. The conjugate of claim 1 or 2, wherein the flavonoid is a catechin-based flavonoid.

4. The conjugate of claim 3, wherein the flavonoid is (-)-epicatechin, (-)-epigallocatechin, (+)-catechin, (-)-epicatechin gallate, or (-)-epigallocatechin gallate.

5. The conjugate of claim 4, wherein the flavonoid is (-)-epigallocatechin gallate.

6. The conjugate of any one of the claims 1 to 5, wherein the polymer is cyclotriphosphazene core phenoxymethyl(methylhydrazono) dendrimer, thiophosphoryl core phenoxymethyl(methylhydrazono) dendrimer, amine-terminated poly(ethylene glycol), or succinimide-terminated poly(ethylene glycol).

7. The conjugate of any one of the claims 1 to 6, wherein the delivery agent is conjugated at the C6 and/or C8 position of the A ring of the flavonoid.

8. The conjugate of any one of the claims 1 to 7, comprising poly ethylene glycol and(-)-epigallocatechin gallate (PEG-EGCG)

9. A method of conjugating a delivery agent comprising a polymer having a free functional group to at least one flavonoid, the method comprising reacting the polymer having the free functional group with the flavonoid, wherein the functional group is:

a free amine group or a functional group capable of being converted to a amine group; or

a free succinimide group or a functional group capable of being converted to a succinimide group;

and wherein the flavonoid exists in a monomeric form or dimeric form before conjugation and remains in the monomeric form or dimeric form after conjugation.

10. The method of claim 9, comprising reacting the delivery agent with two flavonoids, wherein the first flavonoid does not undergo association with the second flavonoid.

11. The method of claim 9 or 10, wherein the flavonoid is a catechin-based flavonoid.

12. The method of claim 11, wherein the flavonoid is (-)-epicatechin, (-)-epigallocatechin, (+)-catechin, (-)-epicatechin gallate, or (-)-epigallocatechin gallate.

13. The method of claim 12, wherein the flavonoid is (-)-epigallocatechin gallate.

14. The method of any one of claims 9 to 13, wherein the polymer is cyclotriphosphazene core phenoxymethyl(methylhydrazono) dendrimer, thiophosphoryl core phenoxymethyl(methylhydrazono) dendrimer, amine-terminated poly(ethylene glycol), or succinimide-terminated poly(ethylene glycol).

15. The method of any one of claims 9 to 14, wherein the delivery agent is conjugated at the C6 and/or C8 position of the A ring of the flavonoid.

16. The method of any one of claims 9 to 15, wherein the flavonoid is (-)-epigallocatechin gallate and the polymer is poly(ethylene glycol).

17. A method of forming an anti-cancer agent delivery vehicle comprising the steps of conjugating a polymer having a free functional group to at least one flavonoid, wherein the functional group is:

a free amine group or a functional group capable of being converted to a amine group; or

a free succinimide group or a functional group capable of being converted to a succinimide group;

and wherein the flavonoid exists in a monomeric form or dimeric form before conjugation and remains in the monomeric form or dimeric form after conjugation.

18. The method of claim 17 further comprising the step of loading the anti-cancer delivery vehicle with an anticancer agent.

19. The method of claim 17 wherein the anti-cancer agent is loaded in the anti-cancer delivery vehicle through hydrophobic interactions and/or Π-Π stacking interactions.