CLAIMS

1. A composition to induce differentiation of a somatic cell into a specialized cell type of interest, the composition comprising a combination of specialized cell type-inducing agents selected from one or more protein and/or peptide molecules, and one or more RNA molecules, each covalently conjugated to a central nanoparticle, wherein the central nanoparticle has a size below about 100 nm in diameter, wherein the specialized cell type of interest is a cardiomyocyte-like cell (iCM), hepatocyte, neural cell, beta cell, blood progenitor cell, myocyte, or osteoblast, and wherein the combination of specialized cell type-inducing agents comprises the agents listed in Table 1.

2. The composition of Claim 1, wherein the specialized cell type-inducing agents are conjugated to the central nanoparticle through first functionalized groups on the nanoparticle.

3. The composition of Claim 1 or Claim 2, wherein the combination of specialized cell type-inducing agent comprises two, three, four, five, or more of the molecules listed in Table 1.

4. The composition of Claim 3, wherein the specialized cell type is a cardiomyocyte-like cell (iCM) and the specialized cell type-inducing agents are selected from Gata4, MEF2C, TBX5, MESP1, Hand2, MYOCD, miR-1, and miR-133.

5. The composition of one of Claims 1-4, wherein the specialized cell type-inducing agents are conjugated to the central nanoparticle through first functionalized

groups on the nanoparticle and the composition further comprises a penetrating peptide (CPP) conjugated to the nanoparticle through a second functionalized group on the nanoparticle.

6. The composition of one of Claims 1-5, wherein the central nanoparticle has a size below about 75, 50, 40, or 30 nm in diameter.

7. The composition of one of Claims 1-6, wherein the central nanoparticle comprises iron or gold molecules, or wherein the central nanoparticle comprises polymeric molecules.

8. The composition of one of Claims 1-7, wherein the central nanoparticle comprises a polymer coating.

9. The composition of Claim 5, wherein the central nanoparticle comprises a polymer coating and the first and/or second functional groups are attached to the polymer coating.

10. The composition of Claim 2, further comprising a first linker molecule linking at least one first functional group and at least one of the specialized cell type inducing agents listed in Table 1.

11. The composition of Claim 10, further comprising a penetrating peptide (CPP) conjugated to the central nanoparticle through a second functionalized group on the nanoparticle, wherein a second linker molecule links the second functional group and the CPP.

12. The composition of Claim 11, wherein the first linker molecule has a first length, wherein the second linker molecule has a second length, and wherein the second length is greater than the first length.

13. The composition of one of Claims 5, 9, 11, or 12, wherein the CPP comprises about 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, or more basic amino acids, or wherein the CPP comprises 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or more contiguous basic amino acids.

14. A cell comprising the composition of any one of Claims 1-13.

15. The cell of Claim 14, wherein the cell is derived from a somatic cell, or wherein the cell is an induced specialized cell type of interest.

16. The cell of Claim 15, wherein the somatic cell is a fibroblast, or wherein the induced specialized cell type of interest is a cardiomyocyte-like cell (iCM), hepatocyte, neural cell, beta cell, blood progenitor cell, myocyte, osteoblast, or other cell type.

17. The cell of any one of Claims 14-16, wherein the cell is a human cell.

18. A method of inducing differentiation of a somatic cell into a specialized cell type of interest, comprising contacting the somatic cell with a composition of any one of Claims 1-13.

19. The method of Claim 18, wherein the specialized cell type of interest is a cardiomyocyte-like cell (iCM), hepatocyte, neural cell, beta cell, blood progenitor cell, myocyte, osteoblast, or other cell type.

20. The method of Claim 18, wherein the somatic cell is a fibroblast, or wherein the somatic cell is a human cell.

21. The method of one of Claims 18-20, wherein the somatic cell is contacted *in vitro* under culture conditions sufficient to permit differentiation of the somatic cell.

22. A method of screening a candidate pharmaceutical composition *in vitro* for activity in an induced specialized cell type of interest as recited in Claim 15, comprising:

contacting the induced specialized cell type of interest with the candidate pharmaceutical composition; and

observing the induced specialized cell type of interest for an indication of activity.

23. The method of Claim 22, wherein the induced specialized cell type of interest is a cardiomyocyte-like cell (iCM), hepatocyte, neural cell, beta cell, blood progenitor cell, myocyte or osteoblast.

24. The method of Claim 18, wherein the somatic cell is obtained from a normal subject or a subject with a specific pathological condition.

25. The method of one of Claim 22, wherein the specialized cell type of interest is induced according to the method recited in one of Claim 18.

26. The method of Claim 22, wherein the indication of activity is an indication of activity of the pharmaceutical composition for treatment of the pathological condition in the subject.

27. The composition of Claim 1, wherein the RNA molecule can include a microRNA, an RNA encoding a transcription factor, a siRNA, a shRNA, and the like.

28. The composition of Claim 3, wherein the specialized cell type is a neural cell and the combination of specialized cell type-inducing agents includes at least one agent selected from PAX6, SOX2, Brn2, Ascll, Mytll, Zicl, NeuroD l, Mir-9, Mir-124, Lmxla, FoxA2, Oct4, Klf4, C-Myc, Lhx3, Ngn2, Hb9, Isll.