CLAIMS

What is claimed is:

1. Use of a composition comprising 5-methyltetrahydrofolate or 5-methyltetrahydrofolic acid in the manufacture of a medicament ~~A method of~~for treating an individual with a monocarboxylate transporter 8 (MCT8) deficiency (Allan-Herndon-Dudley Syndrome), ~~comprising: administering~~wherein the medicament is to be administered to the individual ~~a composition comprising 5-methyltetrahydrofolate or 5-methyltetrahydrofolic acid~~.

2. The ~~method~~ use of claim 1, ~~further comprising the administration of~~wherein vitamin B6 is to be further administered to the individual.

3. The ~~method~~ use of claim 2, wherein the vitamin B6 is selected from the group consisting of pyridoxal, pyridoxol, pyridoxine, pyridoxamine, pyridoxamine phosphate, and pyridoxine hydrochloride.

4. The ~~method~~ use of claim 2, wherein the vitamin B6 is pyridoxal 5'-phosphate.

5. The ~~method~~ use of any one of claims 1-4, ~~further comprising the administration of~~wherein vitamin B2 is to be further administered to the individual.

6. The ~~method~~ use of claim 5, wherein the vitamin B2 is selected from the group consisting of riboflavin, flavin mononucleotide (FMN), flavin adenine dinucleotide (FAD), and dihydro-flavin adenine dinucleotide ($FADH_2$).

7. The ~~method~~ use of any one of claims 1-6, ~~further comprising the administration of~~wherein a thyroid hormone analog, thyroid hormone chaperone, thyroid hormone thyromimetic, or thyroid hormone gene therapy is to be further administered to the individual.

8. The ~~method~~ use of any one of claims 1-7, ~~further comprising the administration of a thyroid hormone analog, thyroid hormone chaperone, thyroid hormone thyromimetic, or thyroid hormone gene therapy,~~ wherein the thyroid hormone

analog, thyroid hormone chaperone, thyroid hormone thyromimetic, or thyroid hormone gene therapy is selected from the group consisting of diiodothyropropionic acid (DITPA), tetraiodothyroacetic acid (TETRAC), triiodothyroacetic acid (TRIAC or Tiratricol or Teatrois), phenylbutyrate, 4-phenylbutyric acid, sodium phenylbutyrate, adeno associated virus 9 based gene therapy (AAV9), eprotirome, sobetirome, or Sob-AM2.

9. A composition comprising (a) a thyroid hormone analog, and (b) 5-methyltetrahydrofolate or 5-methyltetrahydrofolic acid.

10. The composition of claim 9, wherein the thyroid hormone analog is diiodothyropropionic acid (DITPA) or triiodothyroacetic acid (TRIAC or Tiratricol or Teatrois).

11. The composition of any one of claims 9-10, further comprising vitamin B6.

12. The composition of claim 11, wherein the vitamin B6 is selected from the group consisting of pyridoxal, pyridoxol, and pyridoxine.

13. The composition of claim 11, wherein the vitamin B6 is pyridoxal 5'-phosphate.

14. The composition of any one of claims 9-13, further comprising vitamin B2.

15. The composition of claim 14, wherein the vitamin B2 is selected from the group consisting of riboflavin, flavin mononucleotide (FMN), flavin adenine dinucleotide (FAD), and dihydro-flavin adenine dinucleotide ($FADH_{2)}$.