CLAIMS

What is claimed is:

1. A method of diagnosing a type of amyloid disease comprising:

administering an amyloid-reactive agent or detection dye to an individual; and

measuring an organ distribution pattern of the amyloid-reactive agent or detection dye in one or more organs of the individual,

wherein the organ distribution pattern of the amyloid-reactive agent or detection dye indicates the type of amyloid disease.

2. A method of treating an amyloid disease comprising:

administering an amyloid-reactive agent or detection dye to an individual; and

measuring the organ distribution pattern of the amyloid-reactive agent or detection dye for one or more organs of the individual, wherein the organ distribution pattern of the amyloid-reactive agent or detection dye indicates a type of amyloid disease; and

selecting a treatment based upon the type of amyloid disease.

3. A method of diagnosing a type of amyloid disease comprising:

receiving organ distribution pattern data for an amyloid-reactive-agent or detection dye for an individual; and

calculating an organ-to-organ ratio for two or more organs,

wherein the organ-to-organ ratio is used to diagnose the type of amyloid disease in the individual.

4. The method of any one of claims 1-3, wherein the type of amyloid disease comprises systemic amyloidosis.

5. The method of any one of claims 1-4, wherein the type of amyloid disease is selected from the group consisting of amyloid light chain amyloidosis (AL), transthyretin-associated amyloidosis (ATTR), and ALECT2.

6. The method of any one of claims 1-5, wherein the organ is selected from the group consisting of heart, spleen, kidney, and liver.

7. The method of anyone of claims 1-6, wherein the amyloid-reactive agent is an amyloid-reactive peptide that is detectably labeled.

8. The method of any one of claims 1-7, wherein the amyloid-reactive peptide comprises the amino acid sequence set forth in any one of SEQ ID NOs: 1-14.

9. The method of claim 7 or claim 8, wherein the amyloid-reactive peptide comprises the amino acid sequence set forth in SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 13, or SEQ ID NO: 14.

10. The method of any one of claims 1-6, wherein the amyloid-reactive agent reacts with Aβ fibrils.

11. The method of any one of claims 1-6, wherein the amyloid-reactive agent reacts with synthetic fibrils composed of light chains or fragments thereof.

12. The method of any one of claims 1-6, wherein the amyloid-reactive agent is selected from the group consisting of florbetapir, florbetaben and flutemetamol.

13. The method of any one of claims 1-6, wherein the detection dye is ThT.

14. The method of any one of claims 1-13 wherein the organ distribution pattern is measured using PET/CT images.

15. The method of any one of claims 1-14, wherein the amyloid-reactive agent is radiolabeled.

16. The method of any one of claims 1-15, wherein an organ to blood ratio of the amyloid-reactive-agent or detection dye is calculated.

17. The method of any one of claims 1-16, wherein an organ to organ ratio of the amyloid-reactive-agent or detection dye is calculated.

18. The method of claim 17, wherein the organ to organ ratio is selected from the group consisting of liver to heart, spleen to heart, spleen to liver, spleen to kidney, kidney to heart, and kidney to liver.

19. The method of claim 18, wherein if the heart to spleen ratio is above 1.4, the individual is diagnosed with ATTR amyloidosis.

20. The method of claim 18, wherein if the heart to kidney ratio is above 1.62, the individual is diagnosed with ATTR amyloidosis.

21. The method of any one of claims 2-20, further comprising administering the treatment to the individual.

22. A kit for diagnosing a type of amyloid disease comprising an amyloid-reactive agent or detection dye and instructions for use.

23. The kit of claim 22, wherein the instructions for use comprises the method of diagnosis provided in any one of claims 1-21.

24. The kit of claim 22 or claim 23, wherein the kit is for detecting or diagnosing systemic amyloidosis.

25. The kit of any one of claims 22-24, wherein the kit is for detecting or diagnosing amyloid light chain amyloidosis (AL), transthyretin-associated amyloidosis (ATTR), or ALECT2.

26. The kit of any one of claims 22-25, wherein the amyloid-reactive agent is an amyloid-reactive peptide that is detectably labeled.

27. The kit of claim 26, wherein the amyloid-reactive peptide comprises the amino acid sequence set forth in SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 13, or SEQ ID NO: 14.

28. The kit of any one of claims 22-27, wherein the amyloid-reactive agent reacts with Aβ fibrils.

29. The kit of any one of claims 22-28, wherein the amyloid-reactive agent reacts with synthetic fibrils composed of light chains or fragments thereof.

30. The kit of any one of claims 22-29, wherein the amyloid-reactive agent is selected from the group consisting of florbetapir, florbetaben and flutemetamol.

31. The kit of any one of claims 22-30, wherein the detection dye is ThT.

32. The kit of any one of claims 22-31, comprising instructions for measuring an organ distribution pattern.

33. The kit of any one of claims 22-32, wherein the amyloid-reactive agent is radiolabeled.

34. The kit of any one of claims 22-33, comprising instructions for calculating an organ to blood ratio of the amyloid-reactive-agent or detection dye.

35. The kit of any one of claims 22-34, comprising instructions for calculating an organ to organ ratio of the amyloid-reactive-agent or detection dye.

36. The kit of claim 35, wherein the organ to organ ratio is selected from the group consisting of liver to heart, spleen to heart, spleen to liver, spleen to kidney, kidney to heart, and kidney to liver.

37. The kit of claim 36, comprising instructions to provide a diagnosis of ATTR amyloidosis if the heart to spleen ratio is above 1.4.

38. The kit of claim 36, comprising instructions to provide a diagnosis of ATTR amyloidosis if the heart to kidney ratio is above 1.62.

39. The kit of any one of claims 22-38, further comprising a therapeutic agent and instructions for use of a therapeutic agent in the manufacture of a medicament for treating a type of amyloid.

40. The kit of any one of claims 22-39, further comprising instructions to administer the medicament to the individual based upon the diagnosis.