

33. A method of purifying a target species in a sample including magnetic particles having an affinity for the target species, the method comprising:

- (a) flowing the sample to into a microfluidic sorting device having a magnetic field gradient generator to thereby capture at least some of the magnetic particles;
- (b) removing or reducing a magnetic field applied to the magnetic field generator to thereby release captured magnetic particles; and
- (c) collecting purified target species with at least some of the magnetic particles at a collection outlet channel.

34. A microfluidic sorting device comprising:

- (a) a magnetic field gradient generator for exerting a magnetic force on a sample to divert magnetic particles in the sample to a collection channel;
- (b) an amplification station for amplifying nucleic acid of a target species associated with the magnetic particles in the collection channel; and
- (c) a detection station for detecting amplified nucleic acid.

35. The microfluidic sorting device of claim **34**, further comprising a cell lysis station.

36. The microfluidic sorting device of claim **34**, further comprising a labeling station for labeling target species with magnetic particles, wherein labeling station is located upstream from the magnetic field gradient generator.

37. A microfluidic sorting device comprising:

- (a) a labeling station for labeling target species in a sample with magnetic particles having an affinity for the target species;
- (b) a magnetic field gradient generator for exerting a magnetic force on the sample to divert magnetic particles in the sample to a collection channel; and
- (c) a detection station for detecting the target species.

38. The microfluidic sorting device of claim **37**, further comprising a second labeling station for labeling diverted

target species with a fluorophore having an affinity for the target species or for the magnetic particles.

39. The microfluidic sorting device of claim **37**, further comprising a sample reservoir disposed upstream from the magnetic field gradient generator.

40. A microfluidic sorting device comprising:

- (a) a magnetic field gradient generator for exerting a magnetic force on a sample to divert magnetic cells or viruses in the sample to a collection channel;
- (b) a first detection station for detecting magnetic cells or viruses diverted to the collection channel;
- (c) a component release station for releasing components from the magnetic cells or viruses; and
- (d) a second detection station for detecting components of the magnetic cells or viruses.

41. The microfluidic sorting device of claim **40**, further comprising:

a component manipulation station for modifying released components to facilitate their detection in the second detection station.

42. The microfluidic sorting device of claim **41**, wherein the component manipulation station comprises an amplification station for amplifying nucleic acid of the magnetic cells or viruses.

43. The microfluidic sorting device of claim **41**, further comprising:

a labeling station for labeling cells or viruses in the sample with magnetic particles having an affinity for a target species on surfaces of target cells or viruses.

44. The microfluidic sorting device of claim **41**, wherein the magnetic cells or viruses comprise cells or viruses associated with magnetic particles.

45. The microfluidic sorting device of claim **41**, further comprising a sample reservoir disposed upstream from the magnetic field gradient generator.

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