37. The system of claim 34, wherein the chip includes input wells interconnected with output wells by channels, wherein the instrument is configured to stop application of the pressure after air has followed liquid into one or more of channels from one or more of the input wells and before the air has reached all of the emulsions collected in the output wells.

38. The system of claim 34, wherein the instrument is configured to receive an actuation signal from a user after the chip holding the emulsion phases is received by the instrument, and wherein the actuation signal causes the instrument, without any further user input or participation, to apply the pressure, to monitor the pressure, and to stop application of the pressure.

39. The system of claim 34, wherein the fluidics assembly includes a pump that functions as a source of the pressure, and wherein the pressure is applied by the instrument while the pump is fluidically isolated from the chip, not pumping fluid, or both fluidically isolated from the chip and not pumping fluid.

40. A method of emulsion formation, comprising:

applying pressure to a microfluidic chip holding samples and at least one continuous phase, to drive formation of droplets and collection of emulsions in the chip; and

stopping application of the pressure when at least 80% by volume of each of the samples has been converted to droplets.

41. A method of emulsion formation, comprising:

dispensing prospective emulsions phases into wells of a microfluidic chip; disposing the chip in a receiving area of an instrument; and

inputting an actuation signal to the instrument,

wherein the actuation signal causes the instrument to apply pressure to the chip to drive formation and collection of emulsions in parallel in the chip,

and to stop application of pressure when an endpoint of emulsion formation has been reached.

42. The method of claim 41, further comprising a step of connecting the chip to a gasket before the step of disposing.

43. The method of claim 41, wherein the chip includes a plurality of wells, and wherein the gasket is connected to the chip such that wells of the chip are at least partially covered by the gasket.

44. The method of claim 42, further comprising a step of connecting the chip to a cartridge before the step of disposing, wherein the cartridge acts a holder for the chip.

45. The method of claim 44, wherein the cartridge engages the gasket to attach the gasket to the cartridge.

46. A method of emulsion formation, comprising:

applying pressure to a microfluidic chip holding prospective emulsion phases, to drive droplet formation and collection of emulsions in the chip;

monitoring with at least one sensor an aspect of liquid held by the chip and/or of a fluid volume in contact with the liquid for a change that indicates an endpoint for droplet generation has been reached; and

stopping application of the pressure when the change is detected.

47. The method of claim 46, wherein the prospective emulsion phases includes samples and volumes of one or more continuous phases, wherein the step of stopping is based on one or more signals from a sensor that monitors an aspect of one or more of the samples, one or more of the volumes, fluid in contact with liquid held by the chip, or a combination thereof.

48. The method of claim 46, wherein the chip is included in a cassette having a gasket disposed over the chip, wherein pressure application is performed with an instrument, further comprising a step of removing the cassette as a unit from the instrument after application of pressure is stopped.

49. A method of forming an emulsion, comprising:

driving a first phase and an immiscible second phase through a droplet generator and forward along a flow path connecting the droplet generator to a container, such that an emulsion of first phase droplets disposed in the second phase is collected in the container; and

decreasing a volume fraction of the second phase in the collected emulsion by selectively driving the second phase from the container in reverse along the flow path.

50. The method of claim 49, wherein the droplet generator is formed by an intersection of at least one inlet channel for each respective phase and an outlet channel to carry the emulsion, and wherein the outlet channel extends from the droplet generator to a bottom region of the container.

51. The method of claim 49, wherein the first phase is an aqueous phase including nucleic acid, wherein the second phase is an oil phase, and wherein the emulsion has an average of about two genome-equivalents or less of the nucleic acid per droplet.

52. The method of claim 49, wherein the step of driving includes a step of applying a negative gas pressure to the container to draw the first and second phases to the container.

53. The method of claim 49, wherein the step of decreasing a volume fraction of the second phase includes a step of applying a positive gas pressure to the container to push the second phase from the container.

54. The method of claim 49, wherein the droplets of the first phase are buoyant in the second phase, further comprising a step of permitting a substantially droplet-free volume of the second phase to form in the collected emulsion under the droplets after the step of driving and before the step of decreasing the volume fraction.

55. The method of claim 49, wherein the step of driving is performed for a first length of time, and wherein the step of decreasing a volume fraction is performed for a second length of time that is based on the first length of time.

56. The method of claim 55, wherein the second length of time is proportional to the first length of time.

57. The method of claim 49, further comprising a step of loading the first phase into a first reservoir and the second phase into a second reservoir, wherein the step of driving urges the first phase and the second phase to the droplet generator from the first reservoir and the second reservoir, respectively, and wherein the step of decreasing the volume fraction includes a step of driving at least a portion of the second phase into the first reservoir, the second reservoir, or both the first reservoir and the second reservoir.

58. The method of claim 57, wherein the container and each reservoir is a well.

59. The method of claim 49, wherein the step of driving is performed in parallel with a microfluidic chip including a plurality of droplet generators and a plurality of containers that collect emulsions created by respective droplet generators, and wherein the step of decreasing a volume fraction is performed in parallel on each of the collected emulsions.

60. The method of claim 49, wherein the step of driving and the step of decreasing a volume fraction are each performed with pressure transmitted to the chip by a same manifold.

61. A system for emulsion formation, comprising:

an instrument including a fluidics assembly having a pressure source; and

a microfluidic chip including a droplet generator, a container, and respective reservoirs configured to hold a first phase and an immiscible second phase,

wherein the instrument is configured to receive the chip and to apply pressure from the fluidics assembly to the chip to drive the first and second phases through the droplet generator and to the container such that an emulsion of first phase droplets disposed in the second phase is formed by the droplet generator and collected in the container, and also is configured to decrease a volume fraction of the second phase in the collected emulsion by selectively driving the second phase from the container and into at least one of the reservoirs.

62. The system of claim 61, wherein the pressure source includes a vacuum pump, and wherein the pressure applied to the chip is a negative pressure applied to the container such that the first phase and a second phase are drawn from the reservoirs to the container.

63. The system of claim 61, wherein the pressure source includes a first pump and a second pump, wherein the first pump generates negative pressure and the second pump generates positive pressure, and wherein the negative pressure and the positive pressure are applied serially to the chip, with the positive pressure being applied before or after the negative pressure.

64. The system of claim 63, wherein negative pressure generated by the first pump causes the emulsion to be formed and collected, and wherein positive pressure generated by the second pump causes the volume fraction of the second phase to be decreased.

65. The system of claim 61, wherein a first pressure is applied to the chip for a first length of time to form and collect the emulsion, wherein a second pressure is applied to the chip for a second length of time to decrease a volume fraction of the second phase in the collected emulsion, and wherein the instrument is configured to determine the second length of time based on the first length of time.

66. The system of claim 61, further comprising a gasket disposed over the chip, wherein the chip includes a plurality of droplet generators and containers to receive emulsions from respective droplet generators, and wherein the fluidics assembly includes a manifold that operatively engages the gasket to create fluid communication between the fluidics assembly and the chip.

67. The system of claim 66, wherein the manifold has a plurality of ports, and wherein each port provides fluid communication with a different one of the containers when the manifold is engaged with the gasket.

68. A method of emulsion formation, comprising:

establishing negative or positive gas pressure in a reservoir;

creating fluid communication between the reservoir and a microfluidic chip holding prospective emulsion phases; and

maintaining the fluid communication while the established pressure drives droplet formation and collection of emulsions in the chip without modification of the established pressure by a pump.

69. The method of claim 68, wherein the reservoir is a conduit.

70. The method of claim 69, wherein the conduit connects a pressure controller to a valve.

71. The method of claim 68, wherein the reservoir includes a first reservoir fluidically disposed between a pressure controller and a manifold and a second reservoir fluidically disposed between a pump and the pressure controller, and wherein the step of maintaining includes a step of adjusting fluid communication between the first and second reservoirs with the pressure controller.

72. A method of emulsion formation, comprising:

disposing a first microfluidic chip and a first gasket defining a plurality of orifices in a receiving area of an instrument, with the first gasket connected to the first chip;

applying pressure with an instrument to the first microfluidic chip via the orifices to drive droplet formation and collection of emulsions in the first chip;

removing the first chip and the first gasket from the receiving area; and

repeating the steps of disposing, applying, and removing with a second microfluidic chip and a second gasket.

73. The method of claim 72, wherein the first chip and the first gasket are connected to each other before they are disposed in the receiving area.

74. The method of claim 72, further comprising a step of discarding the first chip and the first gasket after the step of removing.

75. The method of claim 72, wherein the first chip has a plurality of wells, and wherein the first gasket connected to the first chip only partially covers each of the wells.

76. The method of claim 75, wherein each well of the first chip is overlapped by an orifice of the first gasket.

77. The method of claim 72, wherein the first chip has a plurality of input wells and a plurality of output wells, and wherein each input well and/or each output well is larger in diameter than an orifice of the first gasket that overlaps such well.

78. The method of claim 77, wherein each input well and/or each output well has a rim, and wherein the first gasket is configured to form a seal circumferentially with the rim of each input well and/or each output well.

79. The method of claim 72, further comprising a step of attaching the first chip to a cartridge that holds the first chip and connects the first gasket to the first chip.

80. A device for forming emulsions, comprising:

a microfluidic chip including a plurality of droplet generators, a plurality of input wells configured to hold and supply prospective emulsion phases for the droplet generators, and a plurality of output wells configured to receive and collect emulsions produced by the droplet generators from the emulsion phases, and

a gasket defining a plurality of orifices and configured to be disposed on and engaged with the chip such that each of the input wells and/or each of the output wells is only partially covered by the gasket.

81. A device for forming emulsions, comprising:

a microfluidic chip including a plurality of droplet generators, a plurality of input wells configured to hold and supply prospective emulsion phases for the droplet generators, and a plurality of output wells configured to receive and collect emulsions produced by the droplet generators from the emulsion phases; and

a perforated gasket defining an array of orifices and configured to be disposed on and engaged with the chip such that each well is overlapped by a different orifice.

82. The device of claim 81, wherein each well is larger in diameter than the orifice that overlaps such well.

83. The device of claim 81, wherein each output well has a rim, and wherein the gasket is configured to form a seal circumferentially with the rim.

84. A device for forming emulsions, comprising:

a microfluidic chip including a plurality of droplet generators, a plurality of input wells configured to hold and supply prospective emulsion phases for the droplet generators, and a plurality of output wells configured to receive and collect emulsions produced by the droplet generators from the emulsion phases; and

a gasket defining an array of orifices and configured to be disposed on and engaged with the chip such that each output well, each input well, or each output well and each input well is overlapped by a different orifice.

85. The device of claim 84, wherein the gasket is configured to cover only a portion of each well that is overlapped.

86. The device of claim 85, wherein the gasket is configured to cover only a perimeter portion of each well that is overlapped.

87. The device of claim 84, wherein each well that is overlapped is larger in diameter than the orifice that overlaps such well.

88. The device of claim 84, wherein each well overlapped by an orifice has a rim, and wherein the gasket is configured to form a seal circumferentially with the rim.

89. The device of claim 84, further comprising a cartridge that receives and holds the chip.

90. The device of claim 89, wherein the cartridge includes a plurality of projections, and wherein the gasket defines apertures configured to be received on the projections to attach the gasket to the cartridge with the orifices overlapping the wells.

91. The device of claim 89, wherein the cartridge has a locked configuration and an unlocked configuration that respectively restrict and permit removal of the chip from the cartridge.

92. The device of claim 89, wherein the cartridge includes an electrically conductive contact element.

93. The device of claim 92, wherein the contact element is disposed on a bottom surface of the cartridge.

94. The device of claim 89, wherein an upper surface region of the cartridge includes an optical element configured to reflect light, and wherein the gasket attached to the cartridge blocks light reflection by the optical element.

95. The device of claim 89, wherein the cartridge has a substantially larger footprint than the chip, optionally having a footprint area that is at least twice that of the chip.

96. A method of forming emulsions, comprising:

selecting (a) a gasket defining a plurality of orifices and (b) a microfluidic chip including a plurality of droplet generators, a plurality of input wells configured to hold and supply prospective emulsion phases to the droplet generators, and a plurality of output wells;

disposing the gasket in engagement with the chip such that each output well, each input well, or each output well and each input well is overlapped by an orifice of the gasket; and

engaging the gasket with a port interface of a fluidics assembly including a pump, to apply pressure to the input wells, the output wells, or both to drive the emulsion phases from the input wells, through the droplet generators, and to the output wells for collection as emulsions.

97. The method of claim 96, wherein the port interface is a manifold.

98. The method of claim 96, wherein each overlapped well is overlapped by a different orifice.

99. A method of emulsion formation, comprising:

applying pressure with gas to drive a first phase and an immiscible second phase through a droplet generator and along a flow path connecting the droplet generator to a container, such that an emulsion of first phase droplets disposed in the second phase is formed by the droplet generator and collected in the container;

monitoring the pressure for a change that meets a predefined condition; and

terminating application of the pressure if the change occurs.

100. The method of claim 99, wherein the step of applying pressure includes a step of applying negative pressure to the container such that the first phase and the second phase are drawn to the container by the negative pressure.

101. The method of claim 99, wherein the step of applying pressure drives parallel droplet formation at respective droplet generators and parallel collection of a plurality of emulsions in separate containers.

102. The method of claim 101, wherein the step of applying pressure is performed with a manifold disposed in fluid communication with each of the separate containers.

103. The method of claim 102, wherein the change in pressure is indicative of air traveling through a droplet generator and along a flow path to a container.

104. The method of claim 99, wherein the pressure is a negative pressure, and wherein the change includes a decrease in the magnitude of the negative pressure.

105. The method of claim 99, wherein the droplet generator is supplied with the first phase and the second phase from respective reservoirs, and wherein at least one of the respective reservoirs being empty can produce the change.

106. The method of claim 99, wherein the step of applying pressure drives parallel droplet formation at respective droplet generators and parallel collection of a plurality of emulsions in separate containers, wherein the droplet generators are supplied with first and second phases from a plurality of reservoirs, and wherein the change in pressure is indicative of any one of the reservoirs being empty.

107. The method of claim 99, wherein the first phase is an aqueous phase containing a nucleic acid target, and wherein the target is present at an average concentration of no more than about two copies per droplet in the emulsion.

108. The method of claim 99, wherein the first phase is an aqueous phase containing genomic DNA, and wherein the genomic DNA is present at an average concentration of no more than about two genome-equivalents per droplet in the emulsion.

109. A system for emulsion formation, comprising:

an instrument including a fluidics assembly having a pressure source and a pressure sensor that monitors pressure in the fluidics assembly; and

a cassette including a chip providing a droplet generator, a container, and respective reservoirs configured to hold a first phase and an immiscible second phase,

wherein the instrument is configured to receive the cassette and to apply a pressure with gas to the chip to drive the first and second phases through the droplet generator and to the container such that an emulsion of first phase droplets disposed in the second phase is formed by the droplet generator and collected in the container, and also is configured to monitor the pressure for a change that meets a predefined condition indicating depletion of liquid from a reservoir, and to terminate application of the pressure if the change occurs.

110. An apparatus for driving emulsification of prospective emulsion phases held by a cassette including a plurality of droplets generators, input reservoirs to hold the emulsion phases for the droplet generators, and containers to collect emulsions, the apparatus comprising:

a seating area for the cassette;

a fluidics assembly including one or more ports;

a drive assembly operative to provide relative movement of the ports and the cassette disposed in the seating area;

a user control; and

a processor,

wherein a single actuation signal communicated to the processor from the user control causes (1) the drive assembly to create fluid communication between the ports and the cassette, and (2) the fluidics assembly to drive, via gas pressure at the ports, the prospective emulsion phases through the droplet generators and to the containers for collection as emulsions.

111. The apparatus of claim 110, wherein the fluidics assembly includes a vacuum pump, and wherein the fluidics assembly drives the prospective emulsion phases to the droplet generators by application of negative gas pressure to the cassette via the ports.

112. The apparatus of claim 110, wherein the fluidics assembly has a different port for each droplet generator.

113. The apparatus of claim 112, wherein the fluidics assembly includes a manifold that provides the ports, and wherein the single actuation signal causes the drive assembly to move the manifold into engagement with the cassette.

114. The apparatus of claim 113, wherein the cassette includes a chip and a gasket, wherein the chip provides the droplet generators, the reservoirs, and the containers, and wherein the gasket forms a seal at a perimeter of each of the containers, each of the reservoirs, or each of the containers and each of the reservoirs.

115. The apparatus of claim 114, wherein the gasket forms a seal at a perimeter of each of the containers and with each of the reservoirs.

116. The apparatus of claim 114, wherein the gasket is perforated to provide a respective orifice that vent each of the containers, each of the reservoirs, or each of the containers and each of the reservoirs.

117. The apparatus of claim 116, wherein each orifice has a smaller diameter than the container or reservoir that the orifice vents, such that the gasket covers a majority of each container, reservoir, or container and reservoir.

118. The apparatus of claim 110, further comprising a door, wherein the seating area is disposed in a chamber that is formed in part by the door, and wherein the single actuation signal causes the door to close such that the seating area is not accessible to a user.

119. The apparatus of claim 110, wherein the emulsion phases are driven by application of positive or negative gas pressure at the ports, wherein the single actuation signal also causes the fluidics assembly to terminate application of the gas pressure at the ports if a predefined condition representing an endpoint for emulsion formation is detected.

120. The apparatus of claim 110, wherein the single actuation signal is provided by a switch.

121. The apparatus of claim 120, wherein the switch is operated by pushing a button.

122. The apparatus of claim 110, further comprising a sensor configured to detect whether or not at least part of the cassette is disposed in the seating area, and wherein the instrument does not implement the actuation signal if the sensor detects that the cassette is not disposed in the seating area.

123. The apparatus of claim 110, wherein the cassette includes a microfluidic chip and a gasket disposed on the chip, further comprising a sensor configured to detect whether or not the gasket is present in the seating area, wherein the instrument does not implement the actuation signal if the sensor detects that the gasket is not present.

124. A system for emulsion formation, comprising:

an instrument including a fluidics assembly capable of generating pressure; and

a cassette including a cartridge and a microfluidic chip configured to be received and held by the cartridge, the chip including a plurality of droplet generators, a plurality of reservoirs configured to hold and supply prospective emulsion phases for the droplet generators, and a plurality of containers,

wherein the instrument is configured to receive the cassette and to apply pressure to the chip with the fluidics assembly to drive the phases through the droplet generators and to the containers for collection as emulsions.

37. The system of claim 34, wherein the chip includes input wells interconnected with output wells by channels, wherein the instrument is configured to stop application of the pressure after air has followed liquid into one or more of channels from one or more of the input wells and before the air has reached all of the emulsions collected in the output wells.

38. The system of claim 34, wherein the instrument is configured to receive an actuation signal from a user after the chip holding the emulsion phases is received by the instrument, and wherein the actuation signal causes the instrument, without any further user input or participation, to apply the pressure, to monitor the pressure, and to stop application of the pressure.

39. The system of claim 34, wherein the fluidics assembly includes a pump that functions as a source of the pressure, and wherein the pressure is applied by the instrument while the pump is fluidically isolated from the chip, not pumping fluid, or both fluidically isolated from the chip and not pumping fluid.

40. A method of emulsion formation, comprising:

applying pressure to a microfluidic chip holding samples and at least one continuous phase, to drive formation of droplets and collection of emulsions in the chip; and

stopping application of the pressure when at least 80% by volume of each of the samples has been converted to droplets.

41. A method of emulsion formation, comprising:

applying pressure to a microfluidic chip holding prospective emulsion phases, to drive droplet formation and collection of emulsions in the chip;

monitoring with at least one sensor an aspect of liquid held by the chip and/or of a fluid volume in contact with the liquid for a change that indicates an endpoint for droplet generation has been reached; and

stopping application of the pressure when the change is detected.

42. The method of claim 41, wherein the prospective emulsion phases includes samples and volumes of one or more continuous phases, wherein the step of stopping is based on one or more signals from a sensor that monitors an aspect of one or more of the samples, one or more of the volumes, fluid in contact with liquid held by the chip, or a combination thereof.

43. The method of claim 41, wherein the chip is included in a cassette having a gasket disposed over the chip, wherein pressure application is performed with an instrument, further comprising a step of removing the cassette as a unit from the instrument after application of pressure is stopped.

44. A method of emulsion formation, comprising:

applying pressure with gas to drive a first phase and an immiscible second phase through a droplet generator and along a flow path connecting the droplet generator to a container, such that an emulsion of first phase droplets disposed in the second phase is formed by the droplet generator and collected in the container;

monitoring the pressure for a change that meets a predefined condition; and

terminating application of the pressure if the change occurs.

45. The method of claim 44, wherein the step of applying pressure includes a step of applying negative pressure to the container such that the first phase and the second phase are drawn to the container by the negative pressure.

46. The method of claim 44, wherein the step of applying pressure drives parallel droplet formation at respective droplet generators and parallel collection of a plurality of emulsions in separate containers.

47. The method of claim 46, wherein the step of applying pressure is performed with a manifold disposed in fluid communication with each of the separate containers.

48. The method of claim 47, wherein the change in pressure is indicative of air traveling through a droplet generator and along a flow path to a container.

49. The method of claim 44, wherein the pressure is a negative pressure, and wherein the change includes a decrease in the magnitude of the negative pressure.

50. The method of claim 44, wherein the droplet generator is supplied with the first phase and the second phase from respective reservoirs, and wherein at least one of the respective reservoirs being empty can produce the change.

51. The method of claim 44, wherein the step of applying pressure drives parallel droplet formation at respective droplet generators and parallel collection of a plurality of emulsions in separate containers, wherein the droplet generators are supplied with first and second phases from a plurality of reservoirs, and wherein the change in pressure is indicative of any one of the reservoirs being empty.

52. The method of claim 44, wherein the first phase is an aqueous phase containing a nucleic acid target, and wherein the target is present at an average concentration of no more than about two copies per droplet in the emulsion.

53. The method of claim 44, wherein the first phase is an aqueous phase containing genomic DNA, and wherein the genomic DNA is present at an average concentration of no more than about two genome-equivalents per droplet in the emulsion.

54. A system for emulsion formation, comprising:

an instrument including a fluidics assembly having a pressure source and a pressure sensor that monitors pressure in the fluidics assembly; and

a cassette including a chip providing a droplet generator, a container, and respective reservoirs configured to hold a first phase and an immiscible second phase,

wherein the instrument is configured to receive the cassette and to apply a pressure with gas to the chip to drive the first and second phases through the droplet generator and to the container such that an emulsion of first phase droplets disposed in the second phase is formed by the droplet generator and collected in the container, and also is configured to monitor the pressure for a change that meets a predefined condition indicating depletion of liquid from a reservoir, and to terminate application of the pressure if the change occurs.

55. An apparatus for driving emulsification of prospective emulsion phases held by a cassette including a plurality of droplets generators, input reservoirs to hold the emulsion phases for the droplet generators, and containers to collect emulsions, the apparatus comprising:

a seating area for the cassette;

a fluidics assembly including one or more ports;

a drive assembly operative to provide relative movement of the ports and the cassette disposed in the seating area;

a user control; and

a processor,

wherein a single actuation signal communicated to the processor from the user control causes (1) the drive assembly to create fluid communication between the ports and the cassette, and (2) the fluidics assembly to drive, via gas pressure at the ports, the prospective emulsion phases through the droplet generators and to the containers for collection as emulsions.

56. The apparatus of claim 55, wherein the fluidics assembly includes a vacuum pump, and wherein the fluidics assembly drives the prospective emulsion phases to the droplet generators by application of negative gas pressure to the cassette via the ports.

57. The apparatus of claim 55, wherein the fluidics assembly has a different port for each droplet generator.

58. The apparatus of claim 57, wherein the fluidics assembly includes a manifold that provides the ports, and wherein the single actuation signal causes the drive assembly to move the manifold into engagement with the cassette.

59. The apparatus of claim 58, wherein the cassette includes a chip and a gasket, wherein the chip provides the droplet generators, the reservoirs, and the containers, and wherein the gasket forms a seal at a perimeter of each of the containers, each of the reservoirs, or each of the containers and each of the reservoirs.

60. The apparatus of claim 59, wherein the gasket forms a seal at a perimeter of each of the containers and with each of the reservoirs.

61. The apparatus of claim 59, wherein the gasket is perforated to provide a respective orifice that vent each of the containers, each of the reservoirs, or each of the containers and each of the reservoirs.

62. The apparatus of claim 61, wherein each orifice has a smaller diameter than the container or reservoir that the orifice vents, such that the gasket covers a majority of each container, reservoir, or container and reservoir.

63. The apparatus of claim 55, further comprising a door, wherein the seating area is disposed in a chamber that is formed in part by the door, and wherein the single actuation signal causes the door to close such that the seating area is not accessible to a user.

64. The apparatus of claim 55, wherein the emulsion phases are driven by application of positive or negative gas pressure at the ports, wherein the single actuation signal also causes the fluidics assembly to terminate application of the gas pressure at the ports if a predefined condition representing an endpoint for emulsion formation is detected.

65. The apparatus of claim 55, wherein the single actuation signal is provided by a switch.

66. The apparatus of claim 65, wherein the switch is operated by pushing a button.

67. The apparatus of claim 55, further comprising a sensor configured to detect whether or not at least part of the cassette is disposed in the seating area, and wherein the instrument does not implement the actuation signal if the sensor detects that the cassette is not disposed in the seating area.

68. The apparatus of claim 55, wherein the cassette includes a microfluidic chip and a gasket disposed on the chip, further comprising a sensor configured to detect whether or not the gasket is present in the seating area, wherein the instrument does not implement the actuation signal if the sensor detects that the gasket is not present.

69. A system for emulsion formation, comprising:

an instrument including a fluidics assembly capable of generating pressure; and

a cassette including a cartridge and a microfluidic chip configured to be received and held by the cartridge, the chip including a plurality of droplet generators, a plurality of reservoirs configured to hold and supply prospective emulsion phases for the droplet generators, and a plurality of containers,

wherein the instrument is configured to receive the cassette and to apply pressure to the chip with the fluidics assembly to drive the phases through the droplet generators and to the containers for collection as emulsions.