48. The detection system of claim 47, wherein the transport device comprises a displaceable member including a deformable, elastic polymeric cover sheet that is initially disposed across an open end of the reservoir section and a shaft that is connected to the polymeric cover sheet, wherein when the shaft is driven to an extended position, the polymeric cover sheet forms a seal with an inner surface of the reservoir section and forces the sample to flow toward the nozzle opening where it is discharged.

49. The detection system of claim 47, wherein the transport device comprises a displaceable member including a base with a deformable seal extending therearound, the base being initially disposed across an open end of the reservoir section with a shaft being connected to the base, wherein when the shaft is driven to an extended position, the base is received within the reservoir section and the flange forms a seal with an inner surface of the reservoir section and forces the sample to flow toward the nozzle opening where it is discharged.

50. The detection system of claim 47, wherein the transport device comprises a member having a bore formed therethrough with a gasket being disposed at a distal end of the member, the gasket forming a seal between the member and the reservoir section, wherein the member is in communication with a source of fluid that is introduced into the reservoir section under predetermined conditions to force the sample to flow toward the nozzle opening where it is discharged.

51. The detection system of claim 50, wherein the fluid comprises a gas.

52. A process for creating a vaporized and ionized fluid stream from a liquid sample for injection into a diagnostic device, the process comprising the steps of:

providing a microfluidic device comprising:

a body having a first surface and an opposing second surface, the body having at least one channel formed therein, the channel extending through the body from the first surface to the second surface, wherein the channel has a reservoir section that is open at the first surface; and

at least one nozzle integrally formed with the body and disposed along and extending beyond the second surface, the number of nozzles equal to the number of channels with each nozzle being in fluid communication with one channel such that each channel terminates in a nozzle opening that is formed as part of the nozzle, wherein a diameter of the nozzle opening is equal to or less than about 50 μm and an outside diameter of the nozzle is equal to or less than about 100 μm;

disposing a sample in the channel at least within the reservoir section;

transporting the sample from the reservoir to the nozzle tip where the sample is discharged; and

applying an electric field to the second surface of the body around each nozzle, the electric field being of sufficient strength so as to cause the discharged sample to be vaporized and ionized.

53. The process of claim 52, wherein the diameter of the nozzle opening is equal to or less than 50 μm and the outside diameter of the nozzle is equal to or less than about 100 μm.

54. The process of claim 52, wherein the step of transporting the sample comprises:

providing a transportation mechanism at the first surface adjacent the open reservoir section; and

manipulating the transportation mechanism to cause a force to be applied to the sample in the direction toward the nozzle opening such that the sample flows to and is discharged through the nozzle opening.

55. The process of claim 54, wherein the transportation mechanism includes a displaceable member having a deformable, elastic polymeric cover sheet and a shaft coupled to the polymeric cover sheet and wherein the step of manipulating the mechanism includes the step of driving the shaft from a retracted position to an extended position, the polymeric cover sheet forming a seal with an inner surface of the reservoir section and wherein the polymeric cover sheet forces the sample to flow to and be discharged through the nozzle opening as the shaft is driven to the extended position.

56. The process of claim 54, wherein the transportation mechanism includes a displaceable member having a base with a sealing flange extending therearound and a shaft coupled to the base and wherein the step of manipulating the mechanism includes the step of driving the shaft from a retracted position to an extended position, the flange forming a seal with an inner surface of the reservoir section and wherein the base forces the sample to flow to and be discharged through the nozzle opening as the shaft is driven to the extended position.

57. The process of claim 54, wherein the transportation mechanism includes a member having a bore formed therethrough with a gasket providing a seal between the member and the first surface of the body, the bore being in communication with a fluid source at one end and with the reservoir section at the other end and wherein the step of manipulating the mechanism includes causing the fluid to flow through the bore and into reservoir section where it applies a force to the sample, resulting in the sample being discharged from the nozzle opening.

58. A process for array spotting on a substrate, the process comprising the steps of:

providing a microfluidic device comprising:

a body having a first surface and an opposing second surface, the body having at least one channel formed therein, the channel extending through the body from the first surface to the second surface, wherein the channel has a reservoir section that is open at the first surface for receiving a sample; and

a plurality of nozzles integrally formed with the body and disposed along and extending beyond the second surface, the number of nozzles equal to the number of channels with each nozzle being in fluid communication with one channel such that each channel terminates in a nozzle opening that is formed as part of the nozzle, wherein a diameter of the nozzle opening is equal to or less than about 100 μm and an outside diameter of the nozzle is equal to or less than about 150 μm;

disposing one or more samples within the plurality of reservoir sections, with only one sample being disposed in one reservoir section;