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(54) **Title:** MICROFLUIDIC CHIP FOR SAMPLE PREPARATION AND SAMPLE PREPARATION SYSTEM INCLUDING SAME

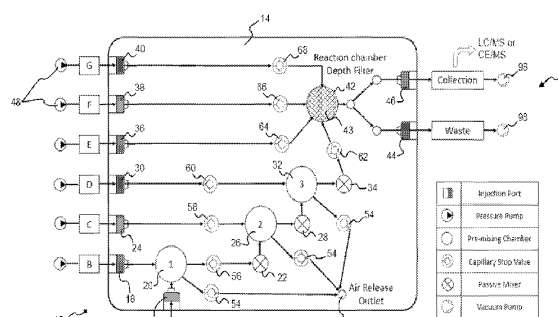


FIG. 1

(57) **Abstract:** A microfluidic chip (12) for sample preparation and a sample preparation system (10) are provided. The microfluidic chip (10) includes: a chip body (14) and a plurality of injection ports (16, 18, 24, 30, 36, 38, 40) provided in the chip body (14). A plurality of chambers (20, 26, 32) and a plurality of mixers (22, 28, 34) are provided in the chip body (14). A first chamber (20) is configured to receive a sample via a first injection port (16) and a reducing agent via a second injection port (18). A first mixer (22) in fluid communication with the first chamber (20) is operable to mix the sample and the reducing agent from the first chamber (20) to produce a denatured and reduced sample. A second chamber (26) in fluid communication with the first mixer (22) is configured to receive an alkylating agent via a third injection port (24). A second mixer (28) in fluid communication with the second chamber (26) is operable to mix the denatured and reduced sample with the alkylating agent to produce an alkylated sample. A third chamber (32) in fluid communication with the second mixer (28) is configured to receive a protein precipitation solution via a fourth injection port (30). A third mixer (34) in fluid communication with the third chamber (32) is operable to mix the alkylated sample with the protein precipitation solution to produce a precipitated sample. A reaction chamber (42) in fluid communication with the third mixer (34) is provided in the chip body (14), the reaction chamber (42) being configured to receive a washing buffer via a fifth injection port (36), a digestion buffer via a sixth injection port (38) and an elution buffer via a seventh injection port (40). A depth filter (43) is received in the reaction chamber (42). A first discharge port (44) and a second discharge port (46) are provided in the chip body (14) in fluid communication with the reaction chamber (42). The first discharge port (44) is operable to discharge waste from the reaction chamber (42) and the second discharge port (46) is operable to discharge a prepared sample.

HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

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