CLAIMS:

1. A diagnostic chip, comprising:

one or more inputs, wherein a sample containing differently sized particles is introduced into at least one of said one or more inputs;

a plurality of separation regions, wherein said sample is pressurized as it passes through said plurality of separation regions, wherein each of said plurality of separation regions comprises a deterministic lateral displacement array, wherein said deterministic lateral displacement array in two or more of said plurality of separation regions has a different etch depth profile; and

a plurality of output reservoirs, wherein each of said plurality of separation regions is associated with a corresponding output reservoir of said plurality of output reservoirs, wherein said plurality of separation regions are configured to carry out hierarchical filtration of particles leading to each of said plurality of output reservoirs having monotonically decreasing particle sizes captured in them.

2. The diagnostic chip as recited in claim 1, wherein pillars in said deterministic lateral displacement array are fabricated using metal assisted chemical etching.

3. The diagnostic chip as recited in claim 1, wherein pillars in said deterministic lateral displacement array are fabricated using nanoimprint lithography.

4. The diagnostic chip as recited in claim 1, wherein said deterministic lateral displacement array is used for particle separation.

5. The diagnostic chip as recited in claim 1, wherein pillars in said deterministic lateral displacement array are tapered.

6. The diagnostic chip as recited in claim 1, wherein pillars in said deterministic lateral displacement array are created using metal assisted chemical etching and silicon oxidation.

7. The diagnostic chip as recited in claim 1, wherein pillars in said deterministic lateral displacement array have a diameter-to-pitch ratio of greater than 0.8, wherein said pillars are designed to prevent clogging of particles in said sample.

8. The diagnostic chip as recited in claim 1 further comprises:

a side-barrier array within said deterministic lateral displacement array for particle separation.

9. The diagnostic chip as recited in claim 1, wherein said sample comprises one of the following: blood, serum, saliva and urine.

10. The diagnostic chip as recited in claim 1, wherein one of said plurality of output reservoirs corresponds to a mixing zone, wherein contents of one of said one or more inputs mixes with contents of said mixing zone.

11. The diagnostic chip as recited in claim 10, wherein said contents of said mixing zone contain exosomes or antibodies.

12. The diagnostic chip as recited in claim 11, wherein, in response to said contents of said one of said one or more inputs corresponding to a chemical, said chemical breaks an exosome wall and releases contents of exomes.