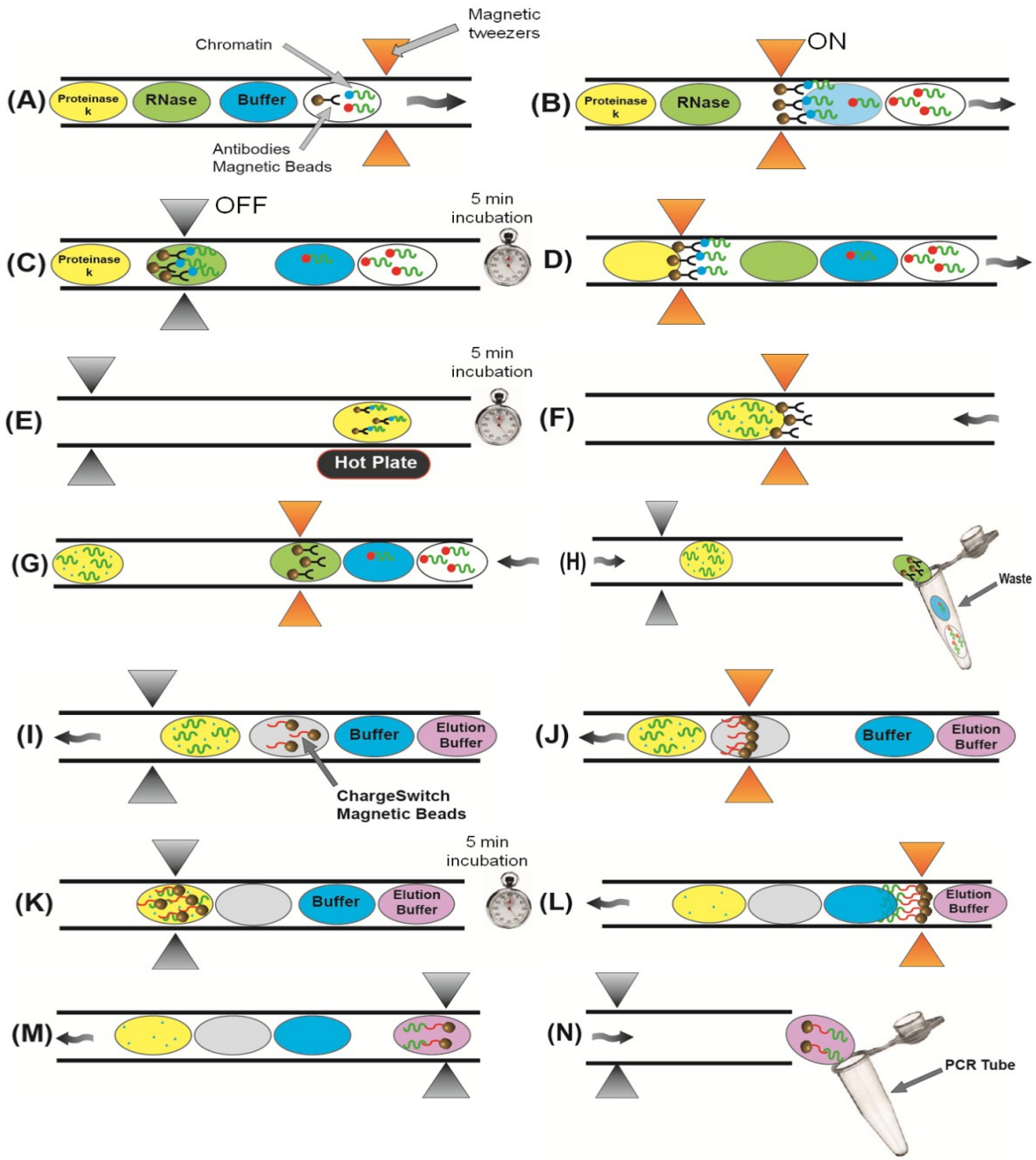
Electronic Supplementary Material (ESI) for Lab on a Chip.

1°) Detailed procedure of ChIP in droplets



Supplementary Fig 1: A first train of droplets was generated. The first droplet was made of a mix containing magnetic beads (MB), antibodies and chromatin (A). MB with captured chromatin were confined and extracted from the droplet by activating the magnetic tweezers. The cluster of MB was washed through five droplets of washing buffers (B). MB were then released in the RNase droplet for 5 min (C), extracted from the RNase droplet and redispersed in the proteinase K droplet for 5 min at 70°C (D-E). After proteins digestion, MB were extracted (F) and released in the RNase droplet (G) to be discarded in a waste tube (H). The droplet containing DNA/digested proteins was then combined with a new train of droplets (I). The charge switch MB were transferred in the DNA/digested proteins droplet (J-K) and after 5 min of incubation MB were washed through three buffer droplets (L). Finally, the MB with captured DNA were released in the elution buffer (M). This last droplet was recovered in a PCR tube (N) and MB were discarded before PCR procedure. The extraction and redispersion processes were based on switching ON (magnetic tweezers in orange) or switching OFF (magnetic tweezers in grey) the magnetic field.

2°) Washing Droplets solution:

Washing Droplet n°1: Low salt wash buffer

Final concentration
2X TE
150mM NaCl
1% Triton X-100
0.1% SDS

Washing Droplet n°2: High salt wash buffer

Final concentration
2X TE
500mM NaCl
1% Triton X-100
0.1% SDS

Washing Droplet n°3: LiCl wash buffer

Final concentration
10 mM Tris pH8
1 mM EDTA
0.25M LiCl
1% NP40
1% DOC = Na-deoxycholate

Washing Droplets n°4 and n°5: 1X TE buffer

3°) Photo of the platform:

Supplementary Fig 2: Droplet Microfluidic Platform for ChIP experiments: (A) 3 axis robot (B) 96 well plate (C) switch valve (D) syringe pump (E) magnetic tweezers (F) USB camera (G) Hot plate (H) Collecting tube