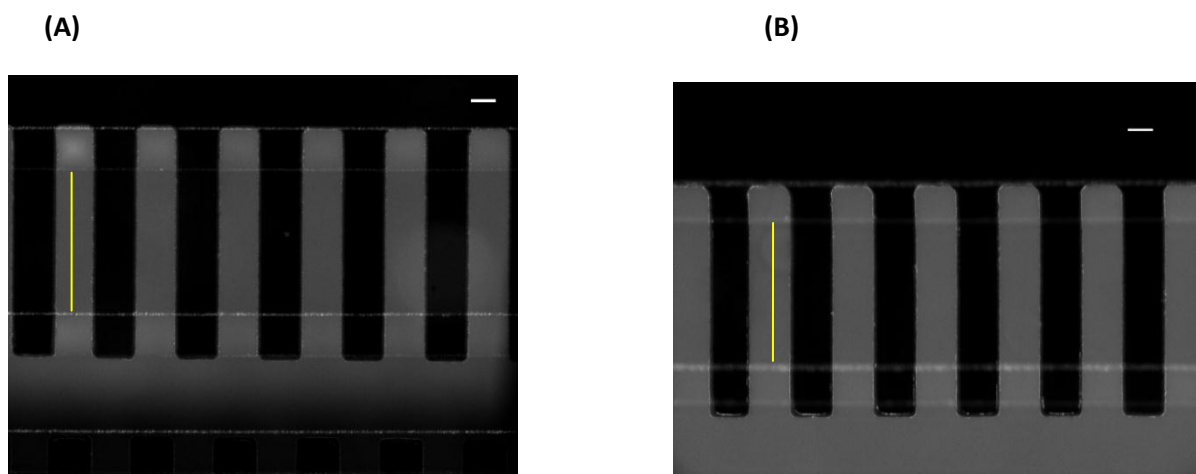**Supporting information**

(A)   (B)

Fig. 4: (A) Epifluorescence microscopy image of part upper channels of the device after flowing fluorescein and PBS buffer for 90 min. Plot profile along the line showing in yellow color was taken using Image J and analyzed using origin. Standard deviation for the gradient along the channels is 4.9%. (B) Epifluorescence microscopy image of part upper channels of the device after flowing only fluorescein (1.4 µM). Same analysis was performed and found out standard deviation for the gradient along the channels is 4.8%.

Table 1: Predicted concentration values for gradient in microfluidic diffusion diluter using COMSOL multiphysics.

Channel number	Simulation values for Concentration
1	0.841637
2	0.819076
3	0.804275
4	0.79234
5	0.781803
6	0.772145
7	0.763132
8	0.754633
9	0.746558
10	0.738847
11	0.731455
12	0.724346
13	0.717496
14	0.710882
15	0.704489
16	0.698303
17	0.692314
18	0.686511
19	0.680886
20	0.675432
21	0.670143
22	0.665012
23	0.660035
24	0.655205
25	0.650519
26	0.645971
27	0.641558
28	0.637275
29	0.633117
30	0.629083
31	0.625167
32	9.447236
33	0.617676
34	0.610618

35	0.603967
36	0.597699
37	0.59179
38	0.58622
39	0.580969
40	0.576016
41	0.571343
42	0.566935
43	0.562775
44	0.558847
45	0.555139
46	0.551635
47	0.548324
48	0.545193
49	0.542233
50	0.539431
51	0.538086
52	0.536778
53	0.535504
54	0.534265
55	0.533058
56	0.531882
57	0.530738
58	0.529623
59	0.528536
60	0.527478
61	0.526446
62	0.52544
63	0.524459
64	0.523502
65	0.522569
66	0.521659
67	0.52077
68	0.519902
69	0.519055
70	0.518228
71	0.517419
72	0.516629
73	0.515857
74	0.515102
75	0.514363

76	0.51364
77	0.512933
78	0.51224
79	0.511561
80	0.510897
81	0.510245
82	0.509606
83	0.508979
84	0.50776
85	0.506585
86	0.505449
87	0.50435
88	0.503284
89	0.50225
90	0.501243
91	0.500261
92	0.499302
93	0.498364
94	0.497444
95	0.496542
96	0.495686

Table 2: Values of parameters used in simulations

Equations used- $\mu u(x,y) = ((h/2)^2 - y^2)\dfrac{\partial P}{\partial x}$

$$\frac{\partial C}{\partial t} = \nabla(D_1 \nabla C) + u\frac{\partial C}{\partial x}$$

Parameters	Values
Diffusion coefficient (D)	0.1
h	0.3
DeltaP	1000
velocity	(0.15^2-(y+0.25)^2)*DeltaP