



- (51) **International Patent Classification:**
B01L 3/00 (2006.01) *C12Q 1/6813* (2018.01)
- (21) **International Application Number:**
PCT/EP2022/050518
- (22) **International Filing Date:**
12 January 2022 (12.01.2022)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
21305027.1 12 January 2021 (12.01.2021) EP
- (71) **Applicants:** PARIS SCIENCES ET LETTRES [FR/FR]; 60, rue Mazarine, 75006 PARIS (FR). ECOLE SUPERIEURE DE PHYSIQUE ET DE CHIMIE INDUSTRIELLES DE LA VILLE DE PARIS [FR/FR]; 10, rue Vauquelin, 75005 PARIS (FR). CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE [FR/FR]; 3, rue Michel Ange, 75016 PARIS (FR). MICROFACTORY SAS [FR/FR]; 10 rue Vauquelin, 75005 PARIS (FR).
- (72) **Inventors:** GEISLER, Hubert; 39 rue du Roi de Sicile, 75004 PARIS (FR). TABELING, Patrick; 25 rue Claude Bernard, 75005 PARIS (FR). GRIFFITHS, Andrew; 1 Rue de Vaugirard, 75006 PARIS (FR). CHIRON, Stéphane; 62 rue Saint Gervais, 69008 LYON (FR). MONTI, Fabrice; 15 rue du Pont Neuf, 91160 SAULX LES CHARTREUX (FR). BLIVET-BAILLY, Gaël; 15 rue du Puits de l'Ermite, 75005 PARIS (FR). ABDORAHIM, Marjan; 15 Avenue Aristide Briand, 92160 ANTONY (FR). TRAN-AMARELIS, Yvette; 39 rue Jenner, 75013 PARIS (FR). NGHE, Philippe; 33 avenue Daumesnil, 94160 SAINT-MANDE (FR).
- (74) **Agent:** BLOT, Philippe et al.; LAVOIX, 2, place d'Estienne d'Orves, 75441 PARIS CEDEX 09 (FR).
- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN,

(54) **Title:** ANALYSIS OF CELLS AND/OR ORGANELLES IN HYDROGEL CAGES

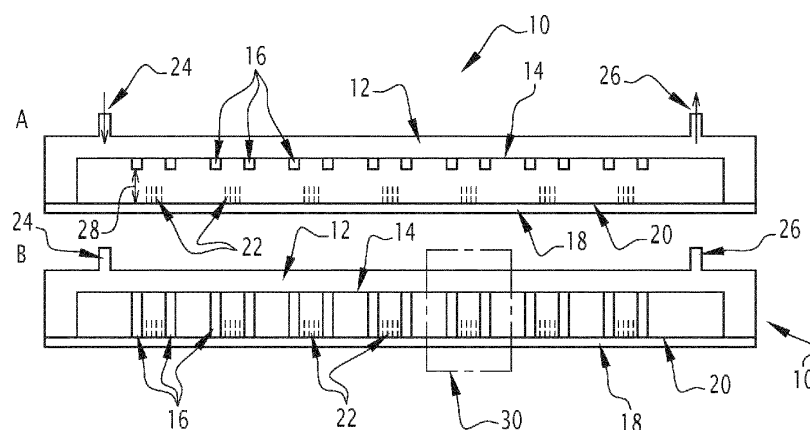


FIG.2

(57) **Abstract:** A microfluidic device (10) comprising: - a first wall (12) comprising a first substrate (14) on which a plurality of closed patterns (16) is grafted, - a second wall (18), facing the first wall (12), comprising a second substrate (20), - a plurality of nucleic acids (22) grafted either on the first substrate (14) or on the second substrate (20), wherein each nucleic acid (22) comprises a barcode that encodes the position of the nucleic acid on said first (14) or second (20) substrate, wherein at least the plurality of closed patterns (16) or the second substrate (20) is made of an actuatable hydrogel which is swellable between a retracted state and a swollen state in which the closed patterns (16) and the second substrate (20) come into contact.

[Continued on next page]

KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, 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.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- with sequence listing part of description (Rule 5.2(a))