

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BERKELEY LIGHTS, INC.,
Petitioner,

v.

THE UNIVERSITY OF BRITISH COLUMBIA,
Patent Owner.

IPR2021-01386
Patent 10,738,270 B2

Before KRISTINA M. KALAN, CHRISTOPHER M. KAISER, and
CHRISTOPHER L. OGDEN, *Administrative Patent Judges*.

KALAN, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I. INTRODUCTION

Petitioner Berkeley Lights, Inc. (“Petitioner”)¹ filed a Petition (Paper 1, “Pet.”) under 35 U.S.C. §§ 311–319 requesting *inter partes* review of claims 1, 29, and 30 of U.S. Patent No. 10,738,270 B2 (Ex. 1001, “the ’270 patent”). Patent Owner The University of British Columbia (“Patent Owner”)² filed a Preliminary Response (Paper 6, “Prelim. Resp.”).

Institution of *inter partes* review is authorized by statute when “the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). Upon consideration of the Petition and the evidence of record, we determine that Petitioner has not established a reasonable likelihood that it would prevail in showing the unpatentability of at least one claim challenged in the Petition. Accordingly, we do not institute *inter partes* review.

A. *Related Proceedings*

The parties identify the following pending U.S. district court cases as related matters: *AbCellera Biologics, Inc. v. Berkeley Lights, Inc.*, No. 5:20-cv-08626 (N.D. Cal.); *AbCellera Biologics, Inc. v. Berkeley Lights, Inc.*, No. 5:20-cv-08624 (N.D. Cal.); and *AbCellera Biologics, Inc. v. Berkeley Lights, Inc.*, No. 5:20-cv-08627 (N.D. Cal.) (collectively, “parallel district court proceedings”). Pet. 3–4; Paper 4, 1. The District Court has stayed these proceedings pending the outcome of this and two other *inter partes* review proceedings. See Ex. 1035.

¹ Petitioner identifies itself as the real party in interest. Pet. 3.

² Patent Owner identifies itself and AbCellera Biologics Inc. as the real parties in interest. Paper 4, 1.

We also note that *inter partes* reviews IPR2021-01249 and IPR2021-01250 involve the same parties and related technology.

B. The '270 Patent

The '270 patent, titled “System and Method for Microfluidic Cell Culture,” describes microfluidic devices and methods “for perfusing a cell with perfusion fluid,” so that “the gravitational forces acting on the cell to keep the cell at or near a retainer or a retaining position exceed the hydrodynamic forces acting on the cell to move it toward an outlet.” Ex. 1001, codes (54), (57).

Figure 4 of the '270 patent, reproduced below, is a cross-sectional view of a chamber and a channel of a microfluidic device while the chamber is being perfused with a fluid. Ex. 1001, 8:39–43.

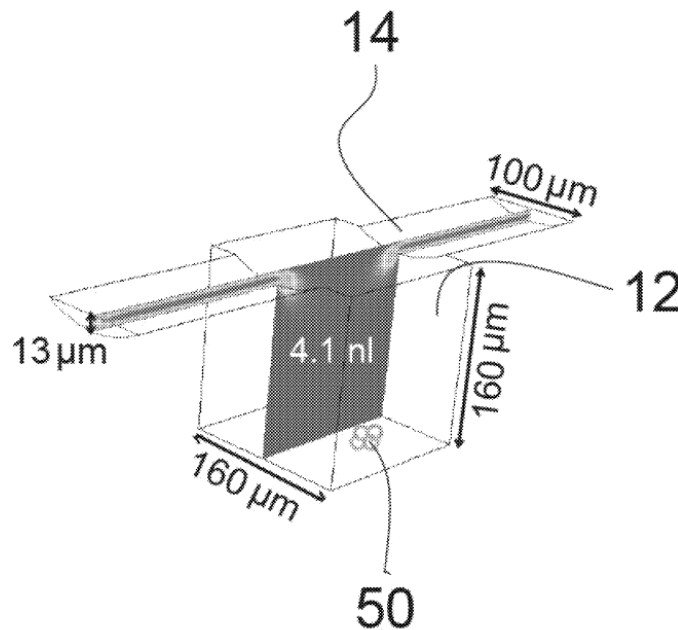


FIGURE 4

Figure 4, above, depicts culture chamber 12 (a cube of 160 μm on each side, forming a volume of about 4.1 nl) and flow channel 14 (100 μm wide and 13 μm deep at its deepest point). Ex. 1001, 36:9–11. Chamber 12

includes trapped cells 50. *Id.* at 34:25–26. The inventors discuss a numerical simulation that predicts a “sudden expansion when the fluid moves from the flow channel [14] to the chamber [12 that] creates a velocity drop,” and “minimal flow rates at the bottom 5/6 of the chamber.” *Id.* at 36:1–4, 36:12–13. The gravitational forces on the cells are “greater than hydrodynamic forces and cells remain in the cell retaining region while the perfusion fluid exits the chamber through the flow channel outlet.” *Id.* at 36:13–15.

The '270 patent also discloses various means of measuring products secreted by cells 50 while they are within culture chamber 12, including “lineage staining; cell-surface protein staining; antibody staining; enzymatic assay; RT-PCR analysis; PCR analysis; sequencing; functional assay; and bead capture assay to characterize the cells.” *Id.* at 6:54–57.

C. The Challenged Claims

Petitioner challenges claims 1, 29, and 30 of the '270 patent. Pet. 1. Claim 1 is independent, and claims 29 and 30 depend directly or indirectly from claim 1. Claim 1 is reproduced below:

1. A method for culturing single cells, comprising:
introducing a population of cells via a single introduction port into a microfluidic device comprising 1,600 to 20,000 microfluidic chambers, wherein each microfluidic chamber comprises an inlet, the single introduction port is in fluid communication with a flow channel that is in fluid communication with the inlets of the microfluidic chambers, wherein single cells of the population are retained in different microfluidic chambers, and wherein the cells are transported via the introduction port and flow channel into the different microfluidic chambers,
providing a cell culture medium to the plurality of microfluidic chambers via the flow channel and the inlets of the microfluidic chambers,

exchanging the cell culture medium in the microfluidic chambers via the flow channel and the inlets of the microfluidic chambers, to create a plurality of individual clonal cell populations, wherein the individual clonal cell populations are retained in the same microfluidic chamber as their respective parental cell, thereby culturing the single cells.

Ex. 1001, 47:18–39.

D. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1, 29, and 30 are unpatentable on the following grounds:

Ground	Challenged Claims	35 U.S.C. ³	Reference(s)/Basis
1	1, 29, 30	§ 102	Park ⁴
2	29, 30	§ 103	Park
3	29, 30	§ 103	Park, Dykstra ⁵
4	29, 30	§ 103	Park, Inoue ⁶

Pet. 7. Petitioner relies on the declaration of Dr. Carl Meinhart (Ex. 1002) and the declaration of Dr. Ingrid Hsieh-Yee (Ex. 1020).

³ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. §§ 102 and 103 that became effective on March 16, 2013. Because the ’270 patent issued from an application filed before March 16, 2013, we apply the pre-AIA versions of the statutory bases for unpatentability.

⁴ Joong Yull Park et al., *Single Cell Trapping in Larger Microwells Capable of Supporting Cell Spreading and Proliferation*, 8 Microfluidics & Nanofluidics 263 (2010) (Ex. 1006).

⁵ Dykstra, B. et al., *High-resolution video monitoring of hematopoietic stem cells cultured in single-cell arrays identifies new features of self-renewal*, 103 Proc. Natl. Acad. Scis. USA 21, 8185–8190 (May 23, 2006) (Ex. 1029).

⁶ Inoue, I., et al., *On-chip culture system for observation of isolated individual cells*, Lab on a Chip 1, 50–55 (August 9, 2001) (Ex. 1030).

II. ANALYSIS

A. Claim Construction

We apply the claim construction standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. The “ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Petitioner contends that “no terms require express construction for purposes of resolving the challenges in this proceeding.” Pet. 8. Petitioner notes that in the parallel district court proceedings, Patent Owner proposed a construction for the term “chamber” that differs from Petitioner’s proposed construction of the term “chamber” in the parallel district court proceedings, and that Petitioner “disagrees with many of Patent Owner’s claim construction positions, including with respect to ‘chamber’ and ‘inlet.’” Pet. 8–10 (citing Ex. 1013 (Patent Owner’s proposed constructions); Ex. 1021 (Petitioner’s proposed constructions); Ex. 1033 (Joint Claim Construction and Prehearing Statement); Ex. 1002 ¶ 45). In the parallel district court proceedings, Patent Owner’s proposed construction for “chamber” is “an enclosed space within a microfluidic device.” Ex. 1033, 3. Although Petitioner does not contend that its arguments rely on the choice of construction for these terms, Petitioner says that its “challenge is based on

the claim constructions urged by Patent Owner—at least implicitly—in the litigation.” Pet. 10.

In its Preliminary Response, Patent Owner contends that, because Petitioner relies on proposed explicit constructions Petitioner does not agree with, Petitioner does not satisfy the requirement of 37 C.F.R. § 42.104(b)(3) requiring a petitioner to identify “[h]ow the challenged claim is to be construed.” Prelim. Resp. 5–11.

Regardless of whether Patent Owner is correct that the Petition is deficient under § 42.104(b)(3), our decision not to institute does not depend on the construction of “chamber” or “inlet.” Thus, we do not need to construe either term explicitly for our decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs*, 200 F.3d at 803)).

B. Level of Ordinary Skill in the Art

The level of ordinary skill in the pertinent art at the time of the invention is relevant to how we construe the patent claims. *See Phillips*, 415 F.3d at 1312–13. It is also one of the factual considerations relevant to obviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). To assess the level of ordinary skill, we construct a hypothetical “person having ordinary skill in the art,” from whose vantage point we assess obviousness and claim interpretation. *See In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998). This legal construct “presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan.” *Id.* (citing *In re Carlson*, 983 F.2d 1032, 1038 (Fed. Cir. 1993)).

Relying on Dr. Meinhart’s testimony, Petitioner argues that a person of ordinary skill in the art “would have had a bachelor’s degree in mechanical engineering, chemical engineering, biomedical engineering, molecular biology, (bio)chemistry, or an equivalent degree relevant to microfluidic biological cell analysis, and three to five years of experience with the construction of and application of microfluidic devices to cell culture and analysis.” Pet. 7–8 (citing Ex. 1002 ¶ 41).

Patent Owner “does not necessarily agree with the proposed level of skill,” but “applies Petitioner’s proposed level of skill only for purposes of this Preliminary Response.” Prelim. Resp. 4–5. Because Petitioner’s proposed level of ordinary skill in the art is supported by testimonial evidence and appears reasonable at this stage in light of the subject matter of the ’270 patent, we adopt it for this decision.

C. Grounds based on Park (Grounds 1–4)

Petitioner contends that Park anticipates claims 1, 29, and 30 (Ground 1), or renders claims 29 and 30 obvious on its own (Ground 2) or in combination with Dykstra (Ground 3) or Inoue (Ground 4). Pet. 7.

1. Park (Ex. 1006)

Park is a journal article describing “a flow method that enables single cell trapping in microwells with dimensions of 50 μm , a size sufficient to allow attachment and division of captured cells.” Ex. 1006, 263. According to Park, prior studies described methods for trapping multiple cells in each well, but “[s]ingle cell trapping is necessary to allow identification of differing cell phenotypes within a population of cells” and “enables observation of the direct descendants of single cells cultured under controlled biological conditions . . . , the analysis of intracellular

compounds . . . , and the measurement of electrical functionality of cells.”

Id. Thus, Park discloses a triangular microwell array configured so that, “[o]nce a cell is captured, the cell presence in the microwell changes the flow pattern, thereby preventing trapping of other cells.” *Id.*

Figures 1a–c of Park are reproduced below:

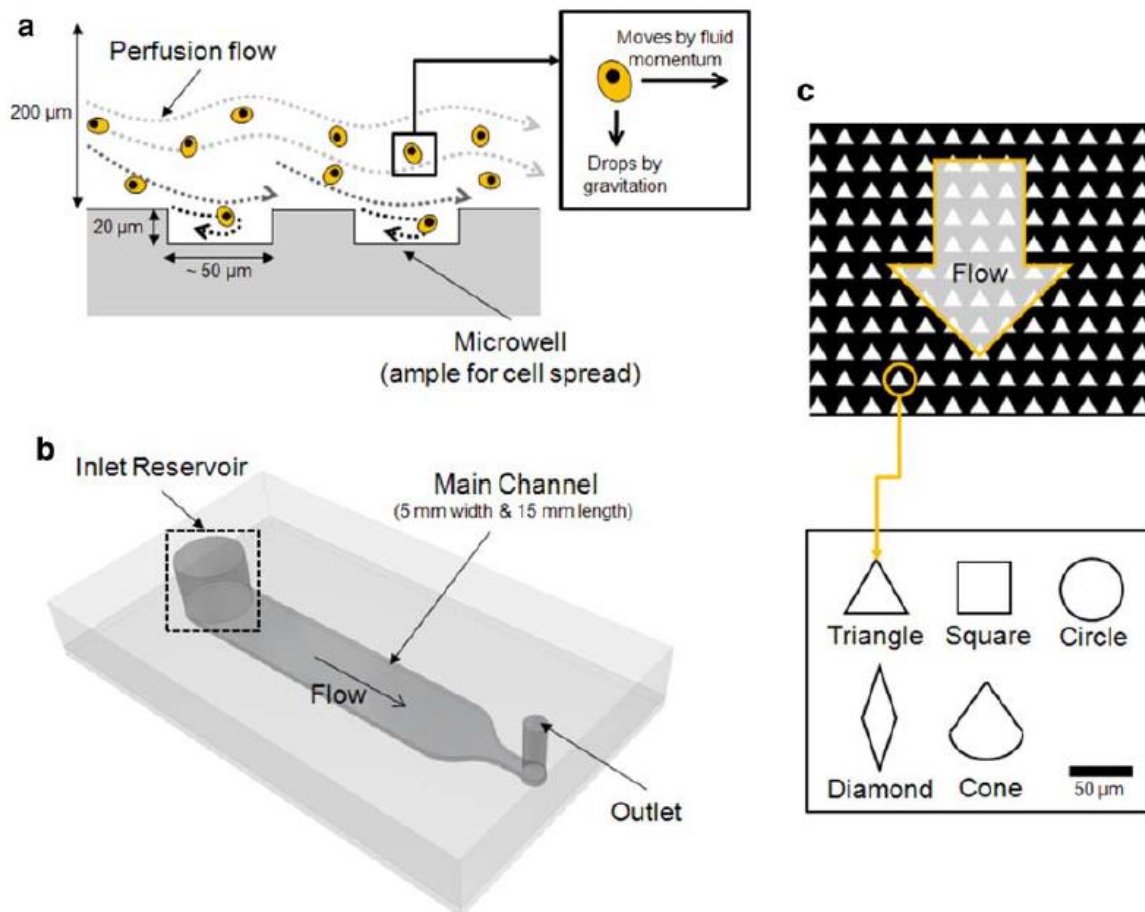


Figure 1b, above, shows the overall system, which includes an “inlet reservoir where the cell suspension is introduced, [a] main channel, microwells (not shown in the figure) patterned on the bottom surface of the main channel, and the outlet which is connected to a pulling syringe pump.” Ex. 1006, 264. Figure 1a, above, is a cross-sectional view of the microwells (20 μm deep and 50 μm wide) and the main channel (200 μm deep). *Id.* “During the perfusion of cell suspension in the channel, the cells sink

gradually due to gravity, and some cells are caught in microwells while others pass and are carried away by flow.” *Id.* Figure 1c, above, shows various microwell shapes that the authors tested in simulation, and shows the orientation of triangular microwells compared to the flow direction. *Id.* Park discloses that “a trial was conducted using a step-down flow rate sequence; initially 0.18 ml/h for 5 min to fill the channel with cells, and then 0.1 ml/h . . . for cell trapping for 10 min, followed by washing out 0.18 ml/h for 5 min.” *Id.* at 267.

2. Analysis

We focus our inquiry on Limitation 1D, which recites the step of “exchanging the cell culture medium in the microfluidic chambers via the flow channel and the inlets of the microfluidic chambers, to create a plurality of individual clonal cell populations” Ex. 1001, 47:33–36. Petitioner argues that Park discloses this limitation “by loading the microwells of its device with cells suspended in culture medium, by flowing the cell suspension through the main channel and over the microwells during a 20-minute period, and then flushing the system with more culture medium after loading.” Pet. 22; *see also* Pet. 21 (citing Ex. 1006, 268; Ex. 1002 ¶ 68 (arguing, in the context of limitation 1C, that the fact that the “flushing” step can use cell culture media suggests that this step is “not just to remove excess cells, but also for purposes of delivering nutrients, for example, and as a consequence, removing waste, from the triangular microwells”))).

In response, Patent Owner contends that Petitioner has failed to show that Park’s flushing step involves “an exchange of culture medium to create clonal cell populations, as required by the claimed inventions.” Prelim. Resp. 12. Patent Owner argues, to the contrary, that “Park’s washout step

occurs during the *loading procedure* of the cells, rather than a later culturing step.” *Id.* at 13. According to Patent Owner, “Park is focused on *preventing* flow into the wells during the washout step—the opposite of ‘exchanging the cell culture medium . . . to create a plurality of individual clonal cell populations.’” *Id.* at 13–14 (quoting Ex. 1001, 47:33–36).

Patent Owner also contends that “Park’s washout step takes place at a 0.18 mL/h rate for only 5 minutes.” Prelim. Resp. 14 (citing Ex. 1006, 267). By multiplying these numbers and converting units, Patent Owner calculates that “the wash step allows flushing of only 15 μ L of the fluid from Park’s device that has a ‘total volume of about 100 μ L.’” *Id.* (quoting Ex. 1006, 265) (citing Ex. 1006, 267). Thus, according to Patent Owner: “To exchange cell culture medium as described by the claimed invention with Park’s 5-minute washout step, Park’s rate of flow would need to be increased exponentially, which is specifically discouraged by Park to avoid ‘dislodg[ing] trapped cells.’” *Id.* (citing Ex. 1006, 268).

On the present record, we agree with Patent Owner that Petitioner has not sufficiently shown that Park’s flushing step introduces a sufficient volume of fluid into the individual microfluidic chambers to “exchange the cell culture medium” are recited in limitation 1D. Even if the flushing step did result in exchanging the culture medium, Petitioner has not adequately explained if, or how, this brief exchange would suffice “to create a plurality of individual clonal cell populations.”⁷

⁷ We make no determination as to whether this phrase is limiting, and Petitioner does not clearly indicate its position on this matter in the Petition. See Pet. 22–25.

For each of Grounds 2–4, Patent Owner argues that Petitioner’s claim 1 anticipation argument fails and, thus, its obviousness arguments fail as well. Prelim. Resp. 16–20. Patent Owner further argues that Petitioner “does not provide any reason to modify Park in view of the knowledge of a POSA to meet the ‘exchanging the cell culture medium . . . to create a plurality of individual clonal cell populations’ limitation but, rather, relies on its express anticipation argument presented for claim 1. *Id.* In view of our determination regarding limitation 1D, above, we agree that the remaining obviousness Grounds 2–4 suffer the shortcomings identified by Patent Owner.

For the above reasons, we determine that Petitioner fails to demonstrate that “every limitation of the claim in issue [is] disclosed, either expressly or under principles of inherency, in a single prior art reference,” *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1255–56 (Fed. Cir. 1989). Petitioner also does not “articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness” as to claims 29 and 30. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)).

3. Conclusion

For the foregoing reasons, we determine Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to its argument that Park anticipates claims 1, 29, and 30, or that Park either alone or in combination with Dykstra or Inoue renders claims 29 and 30 obvious.

III. CONCLUSION

After considering the evidence and arguments on the preliminary record, we determine that Petitioner has not demonstrated a reasonable likelihood of showing that at least one challenged claim of the '270 patent is unpatentable. Therefore, we deny the Petition.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED THAT the Petition is denied, and no *inter partes* review is instituted.

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