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10 UNITED STATES DISTRICT COURT
11 SOUTHERN DISTRICT OF CALIFORNIA

12 ILLUMINA, INC.,

13 Plaintiff,

14 v.

15 LIFE TECHNOLOGIES
16 CORPORATION, APPLIED
17 BIOSYSTEMS LLC, ION TORRENT
18 SYSTEMS, INC., AND THERMO
19 FISHER SCIENTIFIC INC.

20 Defendants.

Case No. 11-CV-03022-JAH (DHB)

**ILLUMINA'S SECOND
AMENDED COMPLAINT**

JURY TRIAL DEMANDED

1 Plaintiff Illumina, Inc. (“Illumina”) alleges as follows:

2 **I. NATURE OF THE ACTION**

3 1. This is an action arising under the patent laws of the United States (35
4 U.S.C. § 271 et seq.) based upon infringement by Defendants Life Technologies
5 Corporation, Applied BioSystems LLC, Ion Torrent Systems, Inc., and Thermo Fisher
6 Scientific Inc. (collectively “Defendants”) of a patent owned by Illumina.

7 2. Illumina seeks damages for Defendants’ willful infringement, including
8 treble damages and attorney fees, and a permanent injunction restraining Defendants
9 from further infringement.

10 **II. THE PARTIES**

11 3. Plaintiff Illumina is a Delaware corporation with a principal place of
12 business at 5200 Illumina Way, San Diego, California 92122.

13 4. Illumina is a worldwide leader in sequencing and microarray tools for
14 genetic analysis.

15 5. Illumina’s revolutionary products have enabled rapid advances in disease
16 research, drug development, and the development of molecular tests for clinical use.

17 6. Illumina has made heavy investments in the research and development of
18 new technologies in the fields of nucleic acid sequencing and microarrays.

19 7. Defendant Thermo Fisher Scientific Inc. is a Delaware corporation with a
20 principal place of business at 81 Wyman Street, Waltham, MA 02451. Upon
21 information and belief, Thermo Fisher Scientific Inc. is currently the parent company
22 and/or owner of all other named co-Defendants. Upon information and belief,
23 Thermo Fisher Scientific both directly, and indirectly through its subsidiaries (including
24 other named Defendants), markets and sells nucleic acid sequencing products based on
25 the Ion Torrent technology platform in the United States. Thermo Fisher Scientific
26 provides information on its website about the accused products and their
27 applications—Ion Torrent™ Next-Generation Sequencing Products and Services,
28

1 including those listed in the examples below, all of which were last visited on October
2 11, 2016:

- 3 • [https://www.thermofisher.com/us/en/home/life-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services.html)
4 [science/sequencing/next-generation-sequencing/ion-torrent-next-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services.html)
5 [generation-sequencing-products-services.html](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services.html)
- 6 • [https://www.thermofisher.com/us/en/home/life-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-workflow/ion-torrent-next-generation-sequencing-run-sequence/ion-s5-ngs-targeted-sequencing.html?icid=WB21693)
7 [science/sequencing/next-generation-sequencing/ion-torrent-next-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-workflow/ion-torrent-next-generation-sequencing-run-sequence/ion-s5-ngs-targeted-sequencing.html?icid=WB21693)
8 [generation-sequencing-workflow/ion-torrent-next-generation-sequencing-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-workflow/ion-torrent-next-generation-sequencing-run-sequence/ion-s5-ngs-targeted-sequencing.html?icid=WB21693)
9 [run-sequence/ion-s5-ngs-targeted-sequencing.html?icid=WB21693](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-workflow/ion-torrent-next-generation-sequencing-run-sequence/ion-s5-ngs-targeted-sequencing.html?icid=WB21693)
- 10 • [https://www.thermofisher.com/us/en/home/life-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-systems-support.html)
11 [science/sequencing/next-generation-sequencing/ion-torrent-next-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-systems-support.html)
12 [generation-sequencing-products-services/ion-torrent-next-generation-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-systems-support.html)
13 [sequencing-systems-support.html](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-systems-support.html)
- 14 • [https://www.thermofisher.com/us/en/home/life-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-systems-support.html)
15 [science/sequencing/next-generation-sequencing/ion-torrent-next-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-systems-support.html)
16 [generation-sequencing-products-services/ion-torrent-next-generation-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-systems-support.html)
17 [sequencing-systems-support.html](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-systems-support.html)
- 18 • [https://www.thermofisher.com/us/en/home/life-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-chips-product-table.html)
19 [science/sequencing/next-generation-sequencing/ion-torrent-next-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-chips-product-table.html)
20 [generation-sequencing-products-services/ion-torrent-next-generation-](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-chips-product-table.html)
21 [sequencing-chips-product-table.html](https://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/ion-torrent-next-generation-sequencing-products-services/ion-torrent-next-generation-sequencing-chips-product-table.html)

22 8. Upon information and belief, as of February 2014, all the remaining
23 named Defendants are wholly-owned subsidiaries or sub-subsidiaries of Thermo Fisher
24 Scientific. Specifically, defendant Life Technologies Corporation is a wholly-owned
25 subsidiary of Thermo Fisher Scientific Inc., and it has a principal place of business at
26 5791 Van Allen Way, Carlsbad, California 92008. Upon information and belief,
27 Thermo Fisher acquired Life Technologies Corporation in February 2014, while this
28 case was pending. *See, e.g.,*

1 <https://www.sec.gov/Archives/edgar/data/97745/000009774514000014/tmok2013.htm>
2 m (Thermo’s February 27, 2014 10K describing the acquisition). As explained below in
3 paragraphs 9 and 10, Life Technologies formed in 2008 through the merger of Applied
4 Biosystems and Invitrogen, and as such, upon information and belief, defendant
5 Applied Biosystems is a wholly-owned subsidiary of Life Technologies. Also, as
6 explained below in paragraph 11, upon information and belief, defendant Ion Torrent is
7 another wholly-owned subsidiary of Life Technologies.

8 9. Upon information and belief, Life Technologies Corporation has directly
9 and indirectly marketed and sold nucleic acid sequencing products based on the Ion
10 Torrent technology platform in the United States. Upon information and belief, Life
11 Technologies Corporation was formed on or around November 21, 2008 when its
12 predecessor company Invitrogen Corporation completed the acquisition of Applied
13 Biosystems, Inc. “to form a new company called Life Technologies Corporation.” *See*
14 [https://www.sec.gov/Archives/edgar/data/1073431/000093639209000101/a51607e1](https://www.sec.gov/Archives/edgar/data/1073431/000093639209000101/a51607e10vk.htm)
15 [0vk.htm](https://www.sec.gov/Archives/edgar/data/1073431/000093639209000101/a51607e10vk.htm). Life Technologies provided information on its website, at least through its
16 Invitrogen internet portal, about the accused products and their applications—Ion
17 Torrent™ Next-Generation Sequencing Products and Services, including those
18 examples at the locations listed in internet archive, Way Back Machine, on June 24,
19 2012 below:

- 20 • <https://web.archive.org/web/20120614153521/http://www.invitrogen.com/site/us/en/home/Products-and-Services/Applications/Sequencing/Semiconductor-Sequencing.html>
- 21
22
- 23 • <https://web.archive.org/web/20120628182700/http://www.invitrogen.com/site/us/en/home/Products-and-Services/Applications/Sequencing/Semiconductor->
- 24
25

1 Sequencing/Semiconductor-Sequencing-Technology/Ion-Torrent-
2 Technology-How-Does-It-Work.html

3 • <https://web.archive.org/web/20120617195003/http://www.invitrogen.com/site/us/en/home/Products-and-Services/Applications/Sequencing/Semiconductor-Sequencing/proton.html>

7 • <https://web.archive.org/web/20120608205938/http://www.invitrogen.com/site/us/en/home/Products-and-Services/Applications/Sequencing/Semiconductor-Sequencing/Publications.html#tab-2>

11 • <https://web.archive.org/web/20120628074258/http://www.invitrogen.com/site/us/en/home/Products-and-Services/Applications/Sequencing/Semiconductor-Sequencing/pgm.html>

14 10. Upon information and belief, Applied BioSystems LLC is a wholly-owned
15 subsidiary of Life Technologies, which in turn is a wholly-owned subsidiary of Thermo
16 Fisher, with a principal place of business at 5791 Van Allen Way, Carlsbad, California
17 92008. *See, e.g.,*

18 [https://www.sec.gov/Archives/edgar/data/1073431/000093639209000101/a51607e1](https://www.sec.gov/Archives/edgar/data/1073431/000093639209000101/a51607e10vk.htm)
19 [0vk.htm](https://www.sec.gov/Archives/edgar/data/1073431/000093639209000101/a51607e10vk.htm) (Life's March 2, 2009 10-K describing the acquisition). Applied BioSystems
20 published technical notes and other instructions regarding how to use the accused
21 products from the Ion Torrent platform on its website, including those listed in the
22 examples below, all of which were visited on January 26, 2015:

23 • [https://www3.appliedbiosystems.com/cms/groups/mcb_support/docu](https://www3.appliedbiosystems.com/cms/groups/mcb_support/documents/generaldocuments/cms_095577.pdf)
24 [ments/generaldocuments/cms_095577.pdf](https://www3.appliedbiosystems.com/cms/groups/mcb_support/documents/generaldocuments/cms_095577.pdf)

25 • [http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma](http://www3.appliedbiosystems.com/cms/groups/applied_marketing_marketing/documents/generaldocuments/cms_093257.pdf)
26 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_marketing_marketing/documents/generaldocuments/cms_093257.pdf)
[ng/documents/generaldocuments/cms_093257.pdf](http://www3.appliedbiosystems.com/cms/groups/applied_marketing_marketing/documents/generaldocuments/cms_093257.pdf)

27 • [http://www3.appliedbiosystems.com/cms/groups/global_marketing_gr](http://www3.appliedbiosystems.com/cms/groups/global_marketing_group/documents/generaldocuments/cms_096778.pdf)
28 [oup/docu](http://www3.appliedbiosystems.com/cms/groups/global_marketing_group/documents/generaldocuments/cms_096778.pdf)
[ments/generaldocuments/cms_096778.pdf](http://www3.appliedbiosystems.com/cms/groups/global_marketing_group/documents/generaldocuments/cms_096778.pdf)

- 1 • [http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma](http://www3.appliedbiosystems.com/cms/groups/applied_markets_marketing/documents/generaldocuments/cms_098680.pdf)
- 2 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_marketing/documents/generaldocuments/cms_098680.pdf)
- 3 • http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma
- 4 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
- 5 • http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma
- 6 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
- 7 • http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma
- 8 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)

9 11. Upon information and belief, Ion Torrent Systems Inc. is a wholly-owned
10 subsidiary of Life Technologies, which in turn is a wholly-owned subsidiary of Thermo
11 Fisher, with a principal place of business at 246 Goose Lane, Suite 100, Guilford,
12 Connecticut 06437. Upon information and belief, Life Technologies Corporation
13 acquired Ion Torrent Systems, Inc. in October 2010. *See, e.g.,*
14 <https://www.sec.gov/Archives/edgar/data/1073431/000119312512089112/d263881d>
15 [10k.htm](https://www.sec.gov/Archives/edgar/data/1073431/000119312512089112/d263881d) (Life's February 29, 2012 10-K describing the acquisition). Ion Torrent
16 advertised its Ion Torrent technology platform and products on its website, including
17 those examples at the locations listed in internet archive, Way Back Machine, on June 6,
18 2010 below:

- 19 • [https://web.archive.org/web/20100606184030/http://www.iontorrent.c](https://web.archive.org/web/20100606184030/http://www.iontorrent.com/ion-personal-genome-machine-sequencer/)
- 20 [om/ion-personal-genome-machine-sequencer/](https://web.archive.org/web/20100606184030/http://www.iontorrent.com/ion-personal-genome-machine-sequencer/)
- 21 • [https://web.archive.org/web/20100606184932/http://www.iontorrent.c](https://web.archive.org/web/20100606184932/http://www.iontorrent.com/ion-semiconductor-sequencing-chips/)
- 22 [om/ion-semiconductor-sequencing-chips/](https://web.archive.org/web/20100606184932/http://www.iontorrent.com/ion-semiconductor-sequencing-chips/)

23 **III. JURISDICTION AND VENUE**

24 12. This is an action for patent infringement arising under the patent laws of
25 the United States, Title 35 of the United States Code.

1 13. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and
2 1338(a).

3 14. Venue is proper in this judicial district under 28 U.S.C. §§ 1391 and
4 1400(b) because, upon information and belief, Defendants Life Technologies
5 Corporation, Ion Torrent System, Inc., Applied BioSystems LLC, and Thermo Fisher
6 Scientific Inc. have, among other things, committed infringing acts in this district.
7 Moreover, Illumina, Inc., Life Technologies Corporation and Applied BioSystems LLC
8 have their principal places of business in this district, and do business in this district
9 generally.

10 **IV. BACKGROUND**

11 15. United States Patent No. 7,060,431 (“the ’431 Patent”), entitled “Method
12 of Making and Decoding of Array Sensors with Microspheres,” was filed on June 24,
13 1999 and was issued by the United States patent and Trademark Office on June 13,
14 2006. A copy of the ’431 Patent is attached hereto as Exhibit A.

15 16. The ’431 Patent reflects Illumina’s heavy investment in research and
16 development of technologies for genetic analysis.

17 17. The ’431 Patent claims priority to U.S. Patent Application No. 09/189,543
18 filed November 10, 1998 and U.S. Patent Application No. 60/090,473 filed on June 24,
19 1998.

20 18. Illumina is the assignee of all right, title and interest in and to the ’431
21 Patent.

22 19. The ’431 Patent claims, amongst other things, methods for making dense
23 arrays using beads that do not have an optical signature.

24 20. Claim 1 of the ’431 Patent reads as follows: “[a] method of making a bead
25 array comprising: a) contacting a substrate with a surface comprising discrete sites at a
26 density of at least 100 sites per 1 mm² with a solution comprising a population of
27 different beads, wherein said beads do not comprise an optical signature; and b)
28 applying energy to said substrate or said solution, or both, such that at least a

1 subpopulation of said different beads randomly associate onto sites.” As discussed
2 further below and in Exhibit D, the use of Defendants’ Ion Torrent products meets
3 each element of claim 1

4 21. On information and belief, each Defendant has described the Ion Torrent
5 technology as “post-light” sequencing that is based on semiconductor sequencing. The
6 Ion Torrent technology platform relies on dense arrays of beads without optical
7 signatures.

8 22. On information and belief, each Defendant has described the Ion Torrent
9 technology as requiring application of energy via a specially adapted centrifuge to load
10 the bead chip substrate with randomly associated bead particles.

11 23. On information and belief, each Defendant has developed, produced,
12 sold, and used products based on the Ion Torrent technology platform, including the
13 Ion Personal Genome Machine (PGM™), Ion Proton™, Ion S5™, and Ion S5™ XL
14 systems for performing nucleic acid sequencing. Upon information and belief, each
15 Defendant continues that activity today. Upon information and belief, all of these
16 sequencing systems perform sequencing on semiconductor chips that contain nucleic
17 acid bead arrays.

18 24. Defendants develop, produce, sell, and use for example, the Ion
19 OneTouch™, Ion OneTouch™ 2, and Ion Chef™ instruments and systems for
20 preparing nucleic acid bead arrays for use in the above named sequencing systems.

21 25. Defendants develop, produce, sell, and use for example, the Ion 314, 316,
22 318 chips, Ion PI/PII, and Ion 520, 530, 540 chips as semiconductor chip substrates for
23 bead arrays for use in the above named sequencing systems.

24 26. Defendants develop, produce, sell, and use for example, the Ion Bead kits,
25 Ion Sphere kits, Ion PGM Sequencing 300 kit, Ion PGM Sequencing 200 kit, Ion PGM
26 Sequencing 200 kit, and the Ion PGM IC 200 kit, as components, supplies, and
27 accessories for preparing nucleic acid bead arrays for use in the above named
28 sequencing systems.

1 27. All of the Ion Torrent technology platform products identified in
2 paragraphs 23-26 include or work with bead arrays containing beads that do not
3 comprise an optical signature, and that are created by applying energy to a solution of
4 different beads over a substrate having sites for random bead association. When anyone
5 uses these products in the manner that Defendants instruct, that person infringes the
6 '431 patent as discussed below and shown in Exhibit B.

7 **V. CLAIM FOR RELIEF (INFRINGEMENT OF THE '431 PATENT)**

8 28. Plaintiff incorporates paragraphs 1-27 of this Complaint here.

9 29. On information and belief, each Defendant, and all of their customers, has
10 directly infringed and continues to directly infringe, literally or by equivalents, claims 1-
11 3, 13, 14, 16, 17, 25, 59-61, 64, 65, 67, 68, and 76 of the '431 patent by using the Ion
12 Torrent technology platform products identified in paragraphs 23-26. Moreover, each
13 Defendant has induced its customers to infringe and contributed to infringement of
14 claims 1-3, 13, 14, 16, 17, 25, 59-61, 64, 65, 67, 68, and 76 of the '431 patent by
15 customers, including the over 20 exemplary customers identified below in paragraphs
16 65-66. Each Defendant has induced and contributed to such infringement, because,
17 with knowledge of the '431 patent, each Defendant has encouraged and instructed
18 customers to use the Ion Torrent products identified above in an infringing manner,
19 knowing that they infringe and that there are no substantial non-infringing uses. The
20 following paragraphs identify examples of the acts of direct, induced and contributory
21 infringement by each named Defendant. Exhibit B also provides a chart demonstrating
22 infringement on an element-by-element basis.

23 **Ion Torrent Systems' Infringement of the '431 patent**

24 30. Since at least February 2010, Ion Torrent Systems Inc. has been and is
25 making, using, selling, and offering to sell within the United States instruments,
26 reagents, kits and services for sequencing using dense arrays of beads without optical
27 signatures, thereby infringing, both directly and indirectly, one or more claims of the
28 '431 Patent. Ion Torrent Systems has and does directly infringe the '431 patent by

1 performing all the steps of the claimed methods with the products identified below. In
2 addition, Ion Torrent Systems has and does induce and contribute to infringement by
3 customers by instructing and encouraging those customers (examples of which are
4 identified below in paragraphs 65-66) to perform all the steps of the claimed methods
5 (using the products identified in paragraph 31). Exhibit B to this complaint sets forth a
6 chart demonstrating how Ion Torrent Systems and others who use the Ion Torrent
7 products meet each element of the asserted claims of the '431 patent. We incorporate
8 Exhibit B by reference into this Complaint.

9 **Ion Torrent Systems' Direct Infringement**

10 31. Ion Torrent Systems' directly infringing activities include using the Ion
11 Torrent technology platform products—such as the Ion Personal Genome Machine
12 (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and
13 Ion Chef™ systems and instruments, and related accessories such as chips (*e.g.*, Ion 314,
14 316, 318 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (*e.g.* Ion Sphere
15 Particles), and kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing
16 300 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200
17 Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit)—to perform
18 semiconductor sequencing. On information and belief, Ion Torrent Systems' activities
19 in this regard included (and include) using those products in the manner shown in
20 Exhibit B to this complaint, which is incorporated by reference here. For example, on
21 information and belief, Ion Torrent System performed internal testing on its products
22 before launching them to the public in February 2010, and those internal tests included
23 performing the patented method as described in the chart in Exhibit B to this
24 complaint. Ion Torrent Systems thus directly infringes the '431 patent under 35 U.S.C.
25 § 271(a), both literally and under the doctrine of equivalents.

26 32. Ion Torrent Systems published materials instructing customers to use
27 these products by attaching nucleic acids to the beads, loading a solution containing the
28 beads onto one of the semiconductor chips, and centrifuging the semiconductor chip so

1 that each bead falls into a well on the chip. For example, Ion Torrent Systems' website
2 provided product information in 2010 on the Ion Torrent products at various locations,
3 such as the following:

- 4 • <https://web.archive.org/web/20100606184030/http://www.iontorrent.com/ion-personal-genome-machine-sequencer/>
- 6 • <https://web.archive.org/web/20100606184932/http://www.iontorrent.com/ion-semiconductor-sequencing-chips/>

8 Once the chips described in those materials were prepared according to the procedures
9 specified by Ion Torrent Systems, it then instructed customers to use the chip for
10 sequencing in one of its sequencing instruments, including the Personal Genome
11 Machine (PGM™).

12 33. When Ion Torrent Systems and its customers use the Ion Torrent
13 platform products as they are intended to be used, that use infringes the '431 patent, as
14 described in Exhibit B to this Complaint. The fact that Ion Torrent promoted these
15 products on its website suggests that Ion Torrent had itself used the products in an
16 infringing manner before releasing them to customers.

17 34. In addition, after Ion Torrent Systems was acquired by Life Technologies
18 in October 2010, the allegations described below at paragraphs 48 to 51 for Life
19 Technologies' direct infringement of the '431 patent would apply equally to Ion Torrent
20 Systems' direct infringement of the '431 patent because, on information and belief, Life
21 Technologies marketed, sold, and provided product literature and services through its
22 wholly-owned subsidiary Ion Torrent Systems.

23 **Ion Torrent Systems' Induced Infringement**

24 35. Ion Torrent Systems has been and is making, using, selling or offering to
25 sell Ion Torrent technology platform products—such as the Ion Personal Genome
26 Machine (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™
27 2 and Ion Chef™ systems and instruments, and related accessories such as chips (*e.g.*
28 Ion 314, 316, 318 chips, Ion PI/PII, and Ion 520, 530, 540 chips,) beads (*e.g.* Ion

1 Sphere Particles), and kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM
2 Sequencing 300 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM
3 Sequencing 200 Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit). Ion
4 Torrent systems also has been and is providing users' manuals and instructions for
5 operating these products to customers that encourage those customers to use the
6 products in a manner, as illustrated in Exhibit B, that directly infringes the '431 patent.
7 Customers follow these instruction, and, in doing so, directly infringe in the manner
8 shown in Exhibit B. Ion Torrent Systems' actions constitute active inducement of its
9 customers (such as the entities listed in paragraph 66-67) to infringe the '431 patent in
10 violation of 35 U.S.C. § 271(b), both literally and under the doctrine of equivalents.

11 36. Ion Torrent Systems has known of the '431 patent since at least
12 September 25, 2009, because, for example, according to the U.S. Patent and Trademark
13 Office's Patent Application Information Retrieval (PAIR) system, the Patent Office
14 received on that date an Information Disclosure Statement from Ion Torrent for its
15 Patent Application No. 12/002,291 listing the '431 patent (Ex. AA). Ion Torrent
16 further submitted other Invention Disclosure Statements for its Patent Application
17 Nos. 12/474,897, 12/492,844, and 12/475,311 in 2010 listing the '431 patent (Exs. BB,
18 CC, & DD). Moreover, Ion Torrent certainly gained knowledge of the '431 patent at
19 least since this case was filed in December 2011. Ion Torrent Systems' knowledge of
20 the '431 patent would immediately give it knowledge that use of its Ion Torrent
21 platform products infringes the '431 patent, because the plain language of the '431
22 patent claims plainly covers use of the Ion Torrent products, as shown in Exhibit B to
23 the attached complaint. At a minimum, Ion Torrent was willfully blind to its
24 infringement of the '431 patent.

25 37. Moreover, on information and belief, Ion Torrent Systems instructed and
26 encouraged its customers to use the Ion Torrent platform products in the infringing
27 manner described in Exhibit B to the attached complaint, just as its successors
28

1 subsequently did in the documents cited in that Exhibit. Ion Torrent provides with its
2 accused products users' manuals and instructions for operating those products.

3 38. On information and belief, all of Ion Torrent's customers follow those
4 instructions, and, when they do so, the customers directly infringe the '431 patent. Ion
5 Torrent's website lists Ion Torrent's customers who directly infringe the '431 patent
6 because they use the Ion Torrent family of products following directions developed and
7 supplied by Ion Torrent. These customers include, for example, Massachusetts General
8 Hospital Diagnostic Molecular Pathology Laboratory (DMPL), Josephine Bay Paul
9 Center for Comparative Molecular Biology and Evolution, and Ambry Genetics. Inc.

10 See, e.g.,

11 [https://web.archive.org/web/20100514112744/http://www.iontorrent.com/about-us-](https://web.archive.org/web/20100514112744/http://www.iontorrent.com/about-us-pgm-grant-program-winners/)
12 [pgm-grant-program-winners/](http://www.ambrygen.com/press-releases/ambry-genetics-first-authorized-customer-service-provider-new-ion-torrent-csp-program) & [http://www.ambrygen.com/press-releases/ambry-](http://www.ambrygen.com/press-releases/ambry-genetics-first-authorized-customer-service-provider-new-ion-torrent-csp-program)
13 [genetics-first-authorized-customer-service-provider-new-ion-torrent-csp-program](http://www.ambrygen.com/press-releases/ambry-genetics-first-authorized-customer-service-provider-new-ion-torrent-csp-program). Ion
14 Torrent Systems' actions thus constitute active inducement of the '431 patent in
15 violation of 35 U.S.C. § 271(b), both literally and under the doctrine of equivalents.

16 39. In addition, after Ion Torrent Systems was acquired by Life Technologies
17 in October 2010, the allegations described below at paragraphs 52 to 59 for Life
18 Technologies' induced infringement of the '431 patent would apply equally to Ion
19 Torrent Systems' induced infringement of the '431 patent because, on information and
20 belief, Life Technologies also marketed, sold, and provided product literature and
21 services through its wholly-owned subsidiary Ion Torrent Systems, among other named
22 Defendants.

23 **Ion Torrent Systems' Contributory Infringement**

24 40. Ion Torrent Systems has been and is making, using, selling or offering to
25 sell the Ion Torrent products—such as the Ion Personal Genome Machine (PGM™),
26 Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and Ion Chef™
27 systems and instruments, and related accessories such as chips (e.g. Ion 314, 316, 318
28 chips, Ion PI/PII, and Ion 520, 530, 540 chips,) beads (e.g. Ion Sphere Particles), and

1 kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing 300 Kit, Ion
2 PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit, Ion
3 PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit)—that its customers use to
4 infringe the claims of the '431 patent.

5 41. Ion Torrent Systems does so knowing that these Ion Torrent products are
6 especially made and adapted for use in infringing the claims of the '431 patent, and that
7 the platforms and related products are not staple articles or capable of a substantial
8 noninfringing use. For example, the Ion Chips, Ion Sphere Particles, and Ion Chef™
9 are made so that a customer will use them to infringe the '431 patent claims by
10 contacting the surface of one of the Ion Chips (which contain wells with at least density
11 recited in the claims) with a solution containing the Ion Sphere Particles (which do not
12 comprise an optical signature), and then applying energy to the solution (by, for
13 example, using the Ion Chef™ system) so that the Ion Sphere Particles randomly
14 associate into the depressions on the Ion Chip. A customer must perform this step in
15 order to use any of these products for their ultimate intended purpose, which is to
16 sequence fragments of DNA using the beads-in-wells arrangement with the Ion
17 Personal Genome Machine (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL
18 sequencing systems. The Ion Chips, Ion Sphere Particles, and Ion Chef do not have
19 any other noninfringing use. Customers do in fact use them to infringe the '431 patent
20 claims as shown in Exhibit B to this complaint. Accordingly, Ion Torrent Systems is
21 liable to Illumina as a contributory infringer under 35 U.S.C. § 271(c), both literally and
22 under the doctrine of equivalents.

23 42. In particular, Ion Torrent Systems has known of the '431 patent since at
24 least September 25, 2009 because, for example, according to the U.S. Patent and
25 Trademark Office's Patent Application Information Retrieval (PAIR) system, the Patent
26 Office received on that date an Information Disclosure Statement from Ion Torrent for
27 its Patent Application No. 12/002,291 listing the '431 patent (Ex. AA). Ion Torrent
28 further submitted other Invention Disclosure Statements for its Patent Application

1 Nos. 12/474,897, 12/492,844, and 12/475,311 in 2010 listing the '431 patent (Exs. BB,
2 CC, & DD). Ion Torrent Systems' knowledge of the '431 patent would immediately
3 give it knowledge that use of its Ion Torrent platform products infringe the '431 patent,
4 because the plain language of the '431 patent claims plainly covers use of the Ion
5 Torrent products, as shown in Exhibit B to the attached complaint. Moreover, use of
6 Ion Torrent Systems' products would necessarily infringe the '431 patent, because, on
7 information and belief, there is no other way to use the products other than the
8 infringing way described in Exhibit B to the attached complaint. Moreover, Ion
9 Torrent certainly gained knowledge of the '431 patent at least since this case was filed in
10 December 2011.

11 43. The allegations described below at paragraphs 60 to 69 for Life
12 Technologies' contributory infringement of the '431 patent apply equally to Ion Torrent
13 Systems' contributory infringement of the '431 patent because, on information and
14 belief, Life Technologies also marketed, sold, and provided product literature and
15 services through its wholly-owned subsidiary Ion Torrent Systems, among other named
16 Defendants.

17 **Ion Torrent Systems' Willful Infringement**

18 44. Ion Torrent Systems' infringing acts are willful in that it has knowledge of
19 Illumina's rights under the '431 Patent, but has continued to knowingly infringe, and
20 actively induce and contribute to infringement by others. Ion Torrent Systems has
21 known of the '431 patent since at least September 25, 2009 because, according to the
22 U.S. Patent and Trademark Office's Patent Application Information Retrieval (PAIR)
23 system, the Patent Office received on that date an Information Disclosure Statement
24 from Ion Torrent for its Patent Application No. 12/002,291 listing the '431 patent (Ex.
25 AA). Ion Torrent further submitted other Invention Disclosure Statements for its
26 Patent Application Nos. 12/474,897, 12/492,844, and 12/475,311 in 2010 listing the
27 '431 patent (Exs. BB, CC, & DD). Moreover, Ion Torrent certainly gained knowledge
28 of the '431 patent at least since this case was filed in December 2011.

1 45. Despite its knowledge of the '431 patent, Ion Torrent Systems has
2 continued to make, use, and sell the Ion Torrent line of products and instructed its
3 customers to use those Ion Torrent products in a manner that infringes. On
4 information and belief, Ion Torrent systems knew that use of its products infringe the
5 '431 patent as any comparison between the plain language of the claims and its products
6 would lead to this conclusion. On information and belief, Ion Torrent Systems has
7 taken no steps to design around the '431 patent or to change the design of its products
8 such that it would no longer infringe the '431 patent. Moreover, Ion Torrent Systems is
9 aware that the U.S. Patent and Trademark Office has rejected its arguments that the
10 '431 patent is invalid in response to three separate reexamination requests it filed with
11 certain other Defendants. Ion Torrent Systems' infringement is thus egregious, willful,
12 and in bad faith, because it knows it is plainly infringing a valid patent.

13 46. Ion Torrent Systems' infringing acts have damaged and are continuing to
14 cause damage to Illumina and have caused and are continuing to cause irreparable harm
15 to Illumina unless permanently enjoined by this Court.

16 **Life Technologies' Infringement of the '431 patent**

17 47. Since at least its acquisition of Ion Torrent Systems Inc. in October 2010,
18 Life Technologies has been and is making, using, selling, and offering to sell within the
19 United States instruments, reagents, kits and services for sequencing using dense arrays
20 of beads without optical signatures, thereby infringing, both directly and indirectly, one
21 or more claims of the '431 Patent. Life Technologies has and does directly infringe the
22 '431 patent by performing all the steps of the claimed methods with the Ion Torrent
23 products identified in paragraph 48. In addition, Life Technologies has and does induce
24 and contribute to infringement by customers by instructing and encouraging those
25 customers (examples of which are identified below in paragraphs 57-58) to perform all
26 the steps of the claimed methods (using the products identified below in paragraph 48).
27 Exhibit B to this complaint sets forth a chart demonstrating how Life Technologies and
28

1 others who use the Ion Torrent products meet each element of the asserted claims of
2 the '431 patent. We incorporate Exhibit B by reference into this Complaint.

3 **Life Technologies' Direct Infringement**

4 48. Life Technologies' directly infringing activities include using the Ion
5 Torrent technology platform products—such as the Ion Personal Genome Machine
6 (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and
7 Ion Chef™ systems and instruments, and related accessories such as chips (*e.g.* Ion 314,
8 316, 318 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (*e.g.* Ion Sphere
9 Particles), and kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing
10 300 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200
11 Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit)—to perform
12 semiconductor sequencing. On information and belief, Life Technologies' activities in
13 this regard included (and include) using those products in the manner shown in Exhibit
14 B to this complaint, which is incorporated by reference here. For example, on
15 information and belief, Life Technologies performed internal testing on its products,
16 and those internal tests included performing the patented method as described in the
17 chart in Exhibit B to this complaint. Life Technologies thus directly infringes the '431
18 patent under 35 U.S.C. § 271(a), both literally and under the doctrine of equivalents.

19 49. Life Technologies publishes user manuals and other materials instructing
20 customers to use the products identified in paragraph 48 by attaching nucleic acids to
21 the beads, loading a solution containing the beads onto one of the semiconductor chips,
22 and centrifuging the semiconductor chip so that each bead falls into a well on the chip.
23 Examples of such materials are attached to this complaint as Exhibits C-Z, and we
24 incorporate each of those by reference into the complaint. Once the chip has been
25 prepared in this manner, Life Technologies then instructs customers to use the chip for
26 sequencing in one of its sequencing instruments, including the Personal Genome
27 Machine (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL. Anyone who follows Life
28 Technologies' instructions, including Life Technologies itself, for how to use the

1 products listed above in paragraph 48 directly infringes the '431 patent, as demonstrated
2 by the claim chart that is attached as Exhibit B to this complaint, which we incorporate
3 by reference into the complaint.

4 50. Life Technologies uses the products identified above in paragraph 48 in
5 the manner shown in Exhibit B to directly infringe at least claims 1-3, 13, 14, 16, 17, 25,
6 59-61, 64, 65, 67, 68, and 76 of the '431 patent. Life Technologies' website shows that
7 it uses the products itself this way in at least two circumstances—(1) when it helps
8 customers test and validate that the accused Ion Torrent products are working, and (2)
9 when it is performing sequencing internally as part of the sequencing services offered to
10 customers. For example, Life Technologies' website describes a service that ensures
11 several of the accused Ion Torrent products are “installed according to the stringent
12 specifications set by Life Technologies” and another service that “verifies and records”
13 the capacity of several accused devices “to meet specified performance criteria after
14 installation, repetitive use, relocation of the instrument, or major service events.” *See*
15 [http://www.lifetechnologies.com/us/en/home/products-and-](http://www.lifetechnologies.com/us/en/home/products-and-services/services/instrument-qualification-services/complianc)
16 [services/services/instrument-qualification-services/complianc](http://www.lifetechnologies.com/us/en/home/products-and-services/services/instrument-qualification-services/complianc) (describing the
17 instrument validation and qualification services); *see also*
18 [http://www.lifetechnologies.com/us/en/home/products-and-](http://www.lifetechnologies.com/us/en/home/products-and-services/services/instrument-qualification-services/instrumen)
19 [services/services/instrument-qualification-services/instrumen](http://www.lifetechnologies.com/us/en/home/products-and-services/services/instrument-qualification-services/instrumen) (stating those
20 “IQ/OQ/IPV” services are available for the accused “Ion Torrent PGM Sequencer
21 and Proton System” platforms). Likewise, Life Technologies' website shows that it uses
22 the accused Ion Torrent products to offer sequencing services to customers who do not
23 wish to purchase a device themselves. *See*

24 [http://www.lifetechnologies.com/us/en/home/life-science/pcr/real-time-](http://www.lifetechnologies.com/us/en/home/life-science/pcr/real-time-pcr/custom-services-reagents-real-time-pcr-qpcr)
25 [pcr/custom-services-reagents-real-time-pcr-qpcr](http://www.lifetechnologies.com/us/en/home/life-science/pcr/real-time-pcr/custom-services-reagents-real-time-pcr-qpcr) (offering custom laboratory services
26 for “NGS” (Next-generation sequencing));

27 [http://www.lifetechnologies.com/us/en/home/products-and-](http://www.lifetechnologies.com/us/en/home/products-and-services/services/instrument-qualification-services/instrumen)
28 [services/services/instrument-qualification-services/instrumen](http://www.lifetechnologies.com/us/en/home/products-and-services/services/instrument-qualification-services/instrumen) (categorizing the accused

1 Ion Torrent PGM Sequencer and Proton System, the Ion Chef System, and the Ion S5
2 and S5 XL Systems as Next-generation sequencing devices). Life Technologies'
3 performance of these testing and service activities for Ion Torrent products requires it
4 to necessarily perform all of the patented steps, as, again, using the Ion Torrent
5 products as described in Life Technologies manuals infringes at least claims 1-3, 13, 14,
6 16, 17, 59-61, 64, 65, 67, and 68 of the '431 patent. *See* Exhibit B to this complaint.

7 51. In addition, after Life Technologies was acquired by Thermo Fisher
8 Scientific in February 2014, the allegations described below at paragraphs 93 to 95 for
9 Thermo Fisher's direct infringement of the '431 patent would apply equally to Life
10 Technologies' direct infringement of the '431 patent because, on information and belief,
11 Thermo Fisher also markets and marketed, sells and sold, and provides and provided
12 product literature and services through its wholly-owned subsidiary Life Technologies,
13 among other named Defendants.

14 **Life Technologies' Induced Infringement**

15 52. Life Technologies has been and is making, using, selling or offering to sell
16 Ion Torrent technology platform products—such as the Ion Personal Genome
17 Machine (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™
18 2 and Ion Chef™ systems and instruments, and related accessories such as chips (*e.g.*
19 Ion 314, 316, 318 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (*e.g.* Ion Sphere
20 Particles), and kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing
21 300 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200
22 Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit). Life Technologies
23 also has been and is providing users' manuals and instructions for operating the
24 platforms to customers that encourage those customers to use the products in a
25 manner, as illustrated in Exhibit B, that directly infringes the '431 patent. Customers
26 follow these instruction, and, in doing so, directly infringe in the manner shown in
27 Exhibit B. Life Technologies' actions constitute active inducement of its customers
28

1 (such as the entities listed in paragraphs 57-58) to infringe the '431 patent in violation of
2 35 U.S.C. § 271(b), both literally and under the doctrine of equivalents.

3 53. Life Technologies has had knowledge of the '431 patent at least since its
4 acquisition of Ion Torrent in October 2010, because, on information and belief,
5 through whole ownership, Life Technologies assumed legal liability for all knowledge
6 and acts for which Ion Torrent had previously been responsible. In addition, upon
7 acquiring Ion Torrent, Life took over the prosecution of Ion Torrent's patent
8 applications, including those where Ion Torrent had previously cited the '431 patent to
9 the Patent Office. For example, the U.S. Patent and Trademark Office's Patent
10 Application Information Retrieval (PAIR) system shows that, on December 16, 2010,
11 the Patent Office received an assignment of U.S. Patent Application No. 12/691,923
12 from Ion Torrent Systems to Life Technologies (Ex. EE), and the prosecution file
13 available at that time included an Information Disclosure Statement from March 15,
14 2010 disclosing the '431 patent (Ex. FF). Moreover, Life certainly had knowledge of
15 the '431 patent upon the original filing of this lawsuit in December 2011, as the original
16 complaint included a copy of the '431 patent. Despite all this knowledge, Life
17 Technologies has continued to affirmatively sell and offer to sell the products in its Ion
18 Torrent platforms and to affirmatively encourage and instruct customers to use those
19 products in a manner that infringes the '431 patent, as reflected in Exhibit B to this
20 Complaint.

21 54. Moreover, Life Technologies has known that the activities it is
22 encouraging infringe the '431 patent. Life Technologies' infringement would be plain
23 to it based on even a cursory comparison of the '431 patent claims with the activities
24 that Life Technologies and its customers undertake with respect to the Ion Torrent
25 sequencing products identified in this complaint. Moreover, on January 26, 2015
26 Illumina served Life Technologies with claim charts demonstrating infringement on an
27 element-by-element basis, yet Life Technologies has continued to affirmatively sell and
28 offer to sell the accused products and to affirmatively encourage and instruct customers

1 to use those products in a manner that infringes the '431 patent. Illumina also served
2 Life Technologies on January 26, 2015 with an exemplary list of at least 20 customers
3 that Life Technologies has been inducing to infringe. On information and belief, Life
4 Technologies has not taken any steps to stop inducing infringement with those entities,
5 and Life Technologies' website still lists all of those entities as customers, showing that
6 Life Technologies has continued to encourage and abet their direct infringement. At a
7 minimum, Life Technologies' activities show it has been willfully blind to the fact that it
8 is instructing, encouraging, and causing its customers to infringe.

9 55. Life Technologies' user manuals and other materials instruct its customers
10 to use the Ion Torrent platforms in a manner that necessarily infringes the '431 patent.
11 For example, Life's instructions tell customers (1) to attach DNA to beads using kits
12 and reagents (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing 300
13 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit,
14 Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit) and instruments (such as
15 the IonChef, Ion OneTouch and OneTouch 2 Systems), (2) to load those beads into
16 wells on a semiconductor chip (such as the Ion 314, 316, 318 Chips and Ion PI/PII
17 Chips), and then (3) to centrifuge the chip so that each bead associates with one of the
18 wells on the semiconductor chip. When customers use the product in the manner that
19 Life Technologies instructs them to, those customers directly infringe the '431 patent,
20 as explained on an element-by-element basis in Exhibit B to this Complaint. Examples
21 of user manuals and other materials that contain these instructions are attached to this
22 complaint as Exhibits C-Z, and we incorporate those by reference into the complaint.

23 56. Life Technologies' user manuals tell customers that they have a limited
24 right to use the products and must do so "only in accordance with the manuals and
25 written instructions provided by Life Technologies and/or its affiliates." *See, e.g., Ex. C*
26 *at 101.* This further demonstrates that Life Technologies intends for customers to use
27 the products in the exact way described in the user manuals, which means it intends that
28 the customers use the products to directly infringe the '431 patent.

1 57. On information and belief, all of Life Technologies' customers follow
2 those instructions, and, when they do so, the customers directly infringe the '431 patent.
3 Over 20 examples of Life Technologies' customers who use the Ion Torrent products
4 to directly infringe the '431 patent are identified on Life Technologies' website,
5 including Affiliated Genetics, Althea Dx, Cedars Sinai, Children's Hospital Los Angeles,
6 Claritas Genomics, Eureka Genomics, Gene Dx, GENEWIZ, Memorial Sloan-
7 Kettering Cancer Center, The Molecular Resource Center, Ohio State University,
8 PrimBio Research Institute, Research and Testing Laboratory, Roswell Park Cancer
9 Institute, RUCDR Infinite Biologics, Sanford Burnham, Selah Genomics, SeqWright
10 Genomic Services, University of Arizona, University of New Mexico, MACROGEN,
11 Indiana University School of Medicine, San Diego State University, and Baylor College
12 of Medicine. *See, e.g.,* [http://www.lifetechnologies.com/us/en/home/life-](http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-provi)
13 [science/sequencing/next-generation-sequencing/certified-service-provi](http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-provi). Life
14 Technologies' website identifies these organizations as "Ion Torrent™ Certified Service
15 Providers" who, for example, offer sequencing services using the accused Ion Proton™
16 System to demonstrate them for others who may wish to evaluate "results from an Ion
17 Proton™ System before investing one of their own." *See*
18 [http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-](http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-provi)
19 [generation-sequencing/certified-service-provi](http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-provi). These customers thus use Life
20 Technologies' products as instructed to directly infringe the '431 patent. And Life
21 Technologies induces those customers to infringe by, for example, providing the Ion
22 Torrent products that are used to infringe and instructing customers to use them in an
23 infringing manner.

24 58. Life Technologies' website includes videos that identify still other users of
25 its products, like AIBio Tech®, which explained it uses Life Technologies' Ion Torrent
26 products, runs about 700-1,000 samples per week, had early access to the Ion Chef, and
27 was instructed by Life Technologies to "see if you can run this instrument into the
28 ground" by running non-stop on multiple chips at a time. *See*

1 https://www.youtube.com/watch?feature=player_embedded&v=jTcLtcfH8Eg. Thus,
2 AIBio Tech is another example of a customer who directly infringes the '431 patent.
3 Life Technologies induced AIBio Tech® to infringe by, for example, providing the Ion
4 Torrent products that are used to infringe and instructing AIBio Tech® to use them in
5 an infringing manner.

6 59. In addition, after Life Technologies was acquired by Thermo Fisher
7 Scientific in February 2014, the allegations described below at paragraphs 96 to 102 for
8 Thermo Fisher's induced infringement of the '431 patent would apply equally to Life
9 Technologies' induced infringement of the '431 patent because, on information and
10 belief, Thermo Fisher also markets and marketed, sells and sold, and provides and
11 provided product literature and services through its wholly-owned subsidiary Life
12 Technologies, among other named Defendants.

13 **Life Technologies' Contributory Infringement**

14 60. Life Technologies has been and is making, using, selling or offering to sell
15 the Ion Torrent products—such as the Ion Personal Genome Machine (PGM™), Ion
16 Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and Ion Chef™
17 systems and instruments, and related accessories such as chips (*e.g.* Ion 314, 316, 318
18 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (*e.g.* Ion Sphere Particles), and
19 kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing 300 Kit, Ion
20 PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit, Ion
21 PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit)—that its customers use to
22 infringe the claims of the '431 patent.

23 61. Life Technologies is making, using, selling or offering to sell these Ion
24 Torrent products knowing that the products are all especially made and adapted for use
25 in infringing the claims of the '431 patent, and that the platforms and related products
26 are not staple articles or capable of a substantial noninfringing use. For example, the
27 Ion Chips, Ion Sphere Particles, and Ion Chef™ are made so that a customer will use
28 them to infringe the '431 patent claims by contacting the surface of one of the Ion

1 Chips (which contain wells with at least density recited in the claims) with a solution
2 containing the Ion Sphere Particles (which do not comprise an optical signature), and
3 then applying energy to the solution (by, for example, using the Ion Chef™ system) so
4 that the Ion Sphere Particles randomly associate into the depressions on the Ion Chip.
5 A customer must perform this step in order to use any of these products for their
6 ultimate intended purpose, which is to sequence fragments of DNA using the beads-in-
7 wells arrangement with the Ion Personal Genome Machine (PGM™), Ion Proton™,
8 Ion S5™, Ion S5™ XL sequencing systems. The Ion Chips, Ion Sphere Particles, and
9 Ion Chef do not have any other noninfringing use. Customers do in fact use them to
10 infringe the '431 patent claims as shown in Exhibit B to this complaint. Accordingly,
11 Life Technologies is liable to Illumina as a contributory infringer under 35 U.S.C.
12 § 271(c), both literally and under the doctrine of equivalents.

13 62. Life Technologies has had knowledge of the '431 patent at least since its
14 acquisition of Ion Torrent in October 2010, because, on information and belief, Life
15 Technologies then assumed legal liability for all knowledge and acts for which Ion
16 Torrent had previously been responsible. In addition, upon acquiring Ion Torrent, Life
17 took over the prosecution of Ion Torrent's patent applications, including those where
18 Ion Torrent had previously cited the '431 patent to the Patent Office. Life
19 Technologies has had knowledge of the '431 patent at least since December 16, 2010
20 because, according to the U.S. Patent and Trademark Office's Patent Application
21 Information Retrieval (PAIR) system, the Patent Office received an assignment of U.S.
22 Patent Application No. 12/691,923 from Ion Torrent Systems to Life Technologies on
23 that date (Ex. EE), and the prosecution file available at that time included an
24 Information Disclosure Statement from March 15, 2010 disclosing the '431 patent (Ex.
25 FF). Moreover, Life certainly had knowledge of the '431 patent upon the original filing
26 of this lawsuit in December 2011, as the original complaint included a copy of the '431
27 patent.

28

1 63. Despite all this knowledge, Life Technologies has continued to
2 affirmatively sell and offer to sell the products in its Ion Torrent platforms and to
3 affirmatively encourage and instruct customers to use those products in a manner that
4 infringes the '431 patent. Moreover, Life Technologies has known that the activities it
5 is encouraging infringe the '431 patent. Life Technologies' infringement would be plain
6 to it based on even a cursory comparison of the '431 patent claims with the activities
7 that Life Technologies and its customers undertake with respect to the Ion Torrent
8 sequencing products identified in this complaint. Moreover, Illumina served Life
9 Technologies on January 26, 2015 with claim charts demonstrating infringement on an
10 element-by-element basis, yet Life Technologies has continued to affirmatively sell and
11 offer to sell the accused products and to affirmatively encourage and instruct customers
12 to use those products in a manner that infringes the '431 patent. Illumina also served
13 Life Technologies on January 26, 2015 with an exemplary list of at least 20 customers
14 that it has been inducing to infringe. Life Technologies has not taken any steps to stop
15 supplying its customers with the products necessary to infringe nor has it stopped
16 instructing them to infringe. Moreover, Life Technologies' website still lists all of those
17 entities as customers, showing that Life Technologies has continued to contributorily
18 infringe. At a minimum, Life Technologies' activities demonstrate that it has been at
19 least willfully blind with respect to whether its activities cause its customers to infringe.

20 64. Life Technologies' products that are the "material or apparatus for use in
21 practicing a patented invention" include, for example, semiconductor chips (such as the
22 Ion 314, 316, 318, Ion PI/PII, or and Ion 520, 530, 540 Chips), reagents and kits for
23 attaching DNA to beads (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM
24 Sequencing 300 Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit, Ion
25 PGM Hi-Q Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit), and
26 instruments for facilitating the attachment of DNA to beads and/or for loading the
27 beads onto the semiconductor chip (such as the IonChef, Ion OneTouch and
28 OneTouch 2 Systems). These products, both individually and collectively, constitute a

1 material part of the invention because, when either Life Technologies or its customers
2 use them in the manner set forth in Life Technologies' user manuals and other
3 instructions, that use infringes the '431 patent. Further detail regarding how Life
4 Technologies and its customers use the products to infringe, along with examples from
5 Life Technologies' user manuals and other materials, can be found in the claim chart
6 attached as Exhibit B to this complaint and incorporated by reference here and in Life
7 Technologies' documents themselves, which are attached as Exhibits C-Z and
8 incorporated by reference herein.

9 65. Life Technologies knows that the products listed above are especially
10 made or especially adapted for use in an infringement of the '431 patent, and not a
11 staple article or commodity of commerce suitable for substantial noninfringing use. As
12 alleged above, Life Technologies has known of the '431 patent since at least October
13 2010. Moreover, Life Technologies has continued to sell the products and instruct
14 customers to use them in a manner that it knows infringes the '431 patent. Indeed, Life
15 Technologies' user manuals tell customers that they have a limited right to use the
16 products and must do so "only in accordance with the manuals and written instructions
17 provided by Life Technologies and/or its affiliates." *See, e.g.*, Ex. C at 101. The only
18 manner in which the manuals and written instructions describe use the products is to
19 load the beads onto a semiconductor chip in a way that infringes the '431 patent. None
20 of Life Technologies' user manuals or other written description describe any way to use
21 the products listed above in a way that does not infringe. Therefore, Life Technologies
22 knows its products are especially made or especially adapted for an infringing use and
23 do not have any noninfringing use whatsoever.

24 66. On information and belief, all of Life Technologies' customers follow
25 Life's instructions, and, when they do so, the customers directly infringe the '431 patent.
26 Over 20 examples of Life Technologies' customers who use the Ion Torrent products
27 to directly infringe the '431 patent are identified on Life Technologies' website,
28 including Affiliated Genetics, Althea Dx, Cedars Sinai, Children's Hospital Los Angeles,

1 Claritas Genomics, Eureka Genomics, Gene Dx, GENEWIZ, Memorial Sloan-
2 Kettering Cancer Center, The Molecular Resource Center, Ohio State University,
3 PrimBio Research Institute, Research and Testing Laboratory, Roswell Park Cancer
4 Institute, RUCDR Infinite Biologics, Sanford Burnham, Selah Genomics, SeqWright
5 Genomic Services, University of Arizona, University of New Mexico, MACROGEN,
6 Indiana University School of Medicine, San Diego State University, and Baylor College
7 of Medicine. *See, e.g.*, [http://www.lifetechnologies.com/us/en/home/life-](http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-provi)
8 [science/sequencing/next-generation-sequencing/certified-service-provi](http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-provi). Life
9 Technologies' website identifies these organizations as "Ion Torrent™ Certified Service
10 Providers" who, for example, offer sequencing services using the accused Ion Proton™
11 System to demonstrate them for others who may wish to evaluate "results from an Ion
12 Proton™ System before investing one of their own." *See*
13 [http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-](http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-provi)
14 [generation-sequencing/certified-service-provi](http://www.lifetechnologies.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-provi). These customers thus use Life
15 Technologies' products as instructed to directly infringe the '431 patent. And Life
16 Technologies induces those customers to infringe by, for example, providing the Ion
17 Torrent products that are used to infringe and instructing customers to use them in an
18 infringing manner.

19 67. Life Technologies' website includes videos that identify still other users of
20 its products, like AIBio Tech®, which explained it uses Life Technologies' Ion Torrent
21 products, runs about 700-1,000 samples per week, had early access to the Ion Chef, and
22 was instructed by Life Technologies to "see if you can run this instrument into the
23 ground" by running non-stop on multiple chips at a time. *See*
24 https://www.youtube.com/watch?feature=player_embedded&v=jTcLtcfH8Eg. Thus,
25 AIBio Tech is another example of a customer who directly infringes the '431 patent.
26 Life Technologies contributed to AIBio Tech®'s infringement by, for example,
27 providing the Ion Torrent products that are used to infringe and instructing AIBio
28 Tech® to use them in an infringing manner.

1 68. Upon information and belief, practice of the methods claimed in the '431
2 Patent are important for the commercial acceptance of Life Technologies' Ion Personal
3 Genome Machine (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, Ion OneTouch™,
4 Ion OneTouch™ 2, and Ion Chef™ systems, instruments, and accessories, including
5 related chips and kits.

6 69. In addition, after Life Technologies was acquired by Thermo Fisher
7 Scientific in February 2014, the allegations described below at paragraphs 103 to 108 for
8 Thermo Fisher's contributory infringement of the '431 patent would apply equally to
9 Life Technologies' contributory infringement of the '431 patent because, on
10 information and belief, Thermo Fisher also markets and marketed, sells and sold, and
11 provides and provided product literature and services through its wholly-owned
12 subsidiary Life Technologies, among other named Defendants.

13 **Life Technologies' Willful Infringement**

14 70. Life Technologies' infringing acts are willful in that it has knowledge of
15 Illumina's rights under the '431 Patent, but has continued to infringe, and actively
16 induce and contribute to infringement by others. Life Technologies has had knowledge
17 of the '431 patent at least since its acquisition of Ion Torrent in October 2010, because,
18 on information and belief, Life Technologies then assumed legal liability for all
19 knowledge and acts for which Ion Torrent had previously been responsible. In
20 addition, upon acquiring Ion Torrent, Life took over the prosecution of Ion Torrent's
21 patent applications, including those where Ion Torrent had previously cited the '431
22 patent to the Patent Office. Life Technologies has known of the '431 patent through
23 its prosecution of those applications since at least December 16, 2010 because,
24 according to the U.S. Patent and Trademark Office's Patent Application Information
25 Retrieval (PAIR) system, the Patent Office received an assignment of U.S. Patent
26 Application No. 12/691,923 from Ion Torrent Systems to Life Technologies on that
27 date (Ex. EE), and the prosecution file available at that time included an Information
28 Disclosure Statement from March 15, 2010 disclosing the '431 patent (Ex. FF).

1 Moreover, Life Technologies has had knowledge of the '431 patent at least since this
2 case was filed in December 2011, as the original complaint included a copy of the '431
3 patent. .

4 71. Despite all its knowledge, Life Technologies has continued to make, use,
5 and sell the Ion Torrent line of products and instructed its customers to use those
6 products in a manner that infringes. On information and belief, Life Technologies
7 knew that use of its products infringed the '431 patent, as any comparison between the
8 plain language of the claims and its products would lead to this conclusion. On
9 information and belief, Life Technologies has taken no steps to design around the '431
10 patent or to change the design of its products such that it would no longer infringe the
11 '431 patent. Life Technologies is aware that the U.S. Patent and Trademark Office has
12 rejected its arguments that the '431 patent is invalid in response to three separate
13 reexamination requests filed by it and certain other named Defendants. Life
14 Technologies' infringement is thus egregious, willful, and in bad faith, because it knows
15 it is plainly infringing a valid patent.

16 72. Life Technologies' infringing acts have damaged and are continuing to
17 cause damage to Illumina and have caused and are continuing to cause irreparable harm
18 to Illumina unless permanently enjoined by this Court.

19 **Applied Biosystems' Infringement of the '431 patent**

20 73. Since at least its parent Life Technologies' acquisition of Ion Torrent
21 Systems Inc. in October 2010, Applied Biosystems has been and is making, using,
22 selling, and offering to sell within the United States Ion Torrent instruments, reagents,
23 kits and services for sequencing using dense arrays of beads without optical signatures,
24 thereby infringing, both directly and indirectly, one or more claims of the '431 Patent.
25 Applied Biosystems has and does directly infringe the '431 patent by performing all the
26 steps of the claimed methods with the products identified below. In addition, Applied
27 Biosystems has and does induce and contribute to infringement by customers by
28 instructing and encouraging those customers (examples of which are identified in

1 paragraph 57-58) to perform all the steps of the claimed methods (using the products
2 identified below in paragraph 74). Exhibit B to this complaint sets forth a chart
3 demonstrating how Applied Biosystems and others who use the Ion Torrent products
4 meet each element of the asserted claims of the '431 patent. We incorporate Exhibit B
5 by reference into this Complaint.

6 **Applied Biosystems' Direct Infringement**

7 74. Applied Biosystems' directly infringing activities include using the Ion
8 Torrent technology platform products—such as the Ion Personal Genome Machine
9 (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and
10 Ion Chef™ systems and instruments, and related accessories such as chips (*e.g.* Ion 314,
11 316, 318 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (*e.g.* Ion Sphere
12 Particles), and kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing
13 300 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200
14 Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit)—to perform
15 semiconductor sequencing. On information and belief, Applied Biosystems' activities
16 in this regard included (and include) using those products in the manner shown in
17 Exhibit B to this complaint, which is incorporated by reference here, to directly infringe
18 the '431 patent. For example, on information and belief, Applied Biosystems
19 performed internal testing on its products before selling them, and those internal tests
20 included performing the patented method as described in the chart in Exhibit B to this
21 complaint. Applied Biosystems thus directly infringes the '431 patent under 35 U.S.C.
22 § 271(a), both literally and under the doctrine of equivalents.

23 75. Applied Biosystems' involvement in selling and using the Ion Torrent
24 products is apparent from the fact that it published user manuals and other materials
25 instructing customers to use the Ion Torrent products in an infringing manner (*i.e.*, by
26 attaching nucleic acids to the beads, loading a solution containing the beads onto one of
27 the semiconductor chips, and centrifuging the semiconductor chip so that each bead
28

1 falls into a well on the chip). For example, Applied Biosystems' website provided
2 product information sheets and user manuals at various locations, such as the following:

- 3 • [https://www3.appliedbiosystems.com/cms/groups/mcb_support/docu](https://www3.appliedbiosystems.com/cms/groups/mcb_support/documents/generaldocuments/cms_095577.pdf)
4 [ments/generaldocuments/cms_095577.pdf](https://www3.appliedbiosystems.com/cms/groups/mcb_support/documents/generaldocuments/cms_095577.pdf)
- 5 • http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma
6 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
7 [ng/docu](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
8 [ments/generaldocuments/cms_093257.pdf](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
- 9 • http://www3.appliedbiosystems.com/cms/groups/global_marketing_gr
10 [oup/docu](http://www3.appliedbiosystems.com/cms/groups/global_marketing_gr)
11 [ments/generaldocuments/cms_096778.pdf](http://www3.appliedbiosystems.com/cms/groups/global_marketing_gr)
- 12 • http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma
13 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
14 [ng/docu](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
15 [ments/generaldocuments/cms_098680.pdf](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
- 16 • http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma
17 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
18 [ng/docu](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
19 [ments/generaldocuments/cms_096461.pdf](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
- 20 • http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma
21 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
22 [ng/docu](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
23 [ments/generaldocuments/cms_094274.pdf](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
- 24 • http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma
25 [rketi](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
26 [ng/docu](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)
27 [ments/generaldocuments/cms_094273.pdf](http://www3.appliedbiosystems.com/cms/groups/applied_markets_ma)

17 Once the chip has been prepared according to the procedures specified by Applied
18 Biosystems, it then instructed customers to use the chip for sequencing in one of its
19 sequencing instruments, including the Personal Genome Machine (PGM™), Ion
20 Proton™.

21 76. When Applied Biosystems and its customers use the Ion Torrent platform
22 products as they are intended to be used, that use infringes the '431 patent, as described
23 in Exhibit B to this Complaint. The fact that Applied Biosystems promoted these
24 products on its website suggests that Applied Biosystems had itself used the products in
25 an infringing manner before releasing them to customers so that they could do so.

26 77. In addition, the allegations described above at paragraphs 48 to 51 for Life
27 Technologies' direct infringement of the '431 patent would apply equally to Applied
28 Biosystems' direct infringement of the '431 patent because, on information and belief,

1 Life Technologies marketed, sold, and provided product literature and services through
2 its wholly-owned subsidiary Applied Biosystems.

3 **Applied Biosystems' Induced Infringement**

4 78. Applied Biosystems has been and is making, using, selling or offering to
5 sell Ion Torrent technology platform products—such as the Ion Personal Genome
6 Machine (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™
7 2 and Ion Chef™ systems and instruments, and related accessories such as chips (*e.g.*
8 Ion 314, 316, 318 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (*e.g.* Ion Sphere
9 Particles), and kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing
10 300 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200
11 Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit). Applied Biosystems
12 has provided users' manuals and instructions for operating the platforms to customers
13 that encourage those customers to use the products in a manner, as illustrated in
14 Exhibits B, that directly infringes the '431 patent. For example, Applied Biosystems has
15 provided these instructions on its website, as noted in paragraph 75 above. Customers
16 follow these instruction, and, in doing so, directly infringe in the manner shown in
17 Exhibit B. Applied Biosystems' actions constitute active inducement of its customers
18 (such as the entities listed in paragraph 57-58) to infringe the '431 patent in violation of
19 35 U.S.C. § 271(b), both literally and under the doctrine of equivalents.

20 79. Applied Biosystems has known of the '431 patent since at least December
21 16, 2010 because, according to the U.S. Patent and Trademark Office's Patent
22 Application Information Retrieval (PAIR) system, the Patent Office received an
23 assignment of U.S. Patent Application No. 12/691,923 from Ion Torrent Systems to
24 Applied Biosystems' parent Life Technologies on that date (Ex. EE), and the
25 prosecution file available at that time included an Information Disclosure Statement
26 from March 15, 2010 disclosing the '431 patent (Ex. FF). In addition, Applied
27 Biosystems had knowledge of the '431 patent upon the filing of this suit in December
28 2011, as the original complaint included a copy of the '431 patent.

1 80. Applied Biosystems' knowledge of the '431 patent would immediately give
2 it knowledge that use of its Ion Torrent platform products infringe the '431 patent,
3 because the plain language of the '431 patent claims plainly covers use of the Ion
4 Torrent products, as shown in Exhibit B to the attached complaint. At a minimum,
5 Applied Biosystems was willfully blind to its infringement of the '431 patent.

6 81. On information and belief, Applied Biosystems instructed and encouraged
7 its customers to use the Ion Torrent platform products in the infringing manner
8 described in Exhibit B to the attached complaint, just as its predecessor and successors
9 subsequently did in the documents cited in Exhibit B. The instructions on Applied
10 Biosystems' websites cited above in paragraph 75 are examples of such instructions by
11 Applied Biosystems. On information and belief, Applied Biosystems also provides with
12 its accused products users' manuals and instructions for operating those products. On
13 information and belief, all of Applied Biosystems' customers follow those instructions,
14 and, when they do so, the customers directly infringe the '431 patent. Applied
15 Biosystems' actions thus constitute active inducement of the '431 patent in violation of
16 35 U.S.C. § 271(b), both literally and under the doctrine of equivalents.

17 82. In addition, the allegations described above at paragraphs 52 to 59 for Life
18 Technologies' induced infringement of the '431 patent applies equally to Applied
19 Biosystems' induced infringement of the '431 patent because, on information and belief,
20 Life Technologies also marketed, sold, and provided product literature and services
21 through its wholly-owned subsidiary Applied Biosystems, among other named
22 Defendants.

23 **Applied Biosystems' Contributory Infringement**

24 83. Applied Biosystems has been and is making, using, selling or offering to
25 sell the Ion Torrent products—such as the Ion Personal Genome Machine (PGM™),
26 Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and Ion Chef™
27 systems and instruments, and related accessories such as chips (*e.g.* Ion 314, 316, 318
28 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (*e.g.* Ion Sphere Particles), and

1 kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing 300 Kit, Ion
2 PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit, Ion
3 PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit)—that its customers use to
4 infringe the claims of the '431 patent.

5 84. Applied Biosystems is making, using, selling or offering to sell these Ion
6 Torrent products knowing that the products are all especially made and adapted for use
7 in infringing the claims of the '431 patent, and that the platforms and related products
8 are not staple articles or capable of a substantial noninfringing use. For example, the
9 Ion Chips, Ion Sphere Particles, and Ion Chef™ are made so that a customer will use
10 them to infringe the '431 patent claims by contacting the surface of one of the Ion
11 Chips (which contain wells with at least density recited in the claims) with a solution
12 containing the Ion Sphere Particles (which do not comprise an optical signature), and
13 then applying energy to the solution (by, for example, using the Ion Chef™ system) so
14 that the Ion Sphere Particles randomly associate into the depressions on the Ion Chip.
15 A customer must perform this step in order to use any of these products for their
16 ultimate intended purpose, which is to sequence fragments of DNA using the beads-in-
17 wells arrangement with the Ion Personal Genome Machine (PGM™), Ion Proton™,
18 Ion S5™, Ion S5™ XL sequencing systems. The Ion Chips, Ion Sphere Particles, and
19 Ion Chef do not have any other noninfringing use. Customers do in fact use them to
20 infringe the '431 patent claims as shown in Exhibit B to this complaint. Accordingly,
21 Applied Biosystems is liable to Illumina as a contributory infringer under 35 U.S.C.
22 § 271(c), both literally and under the doctrine of equivalents.

23 85. Applied Biosystems has known of the '431 patent since at least December
24 16, 2010 because, according to the U.S. Patent and Trademark Office's Patent
25 Application Information Retrieval (PAIR) system, the Patent Office received an
26 assignment of U.S. Patent Application No. 12/691,923 from Ion Torrent Systems to
27 Applied Biosystems' parent Life Technologies on that date (Ex. EE), and the
28 prosecution file available at that time included an Information Disclosure Statement

1 from March 15, 2010 disclosing the '431 patent (Ex. FF). Moreover, Applied
2 Biosystems certainly had knowledge of the '431 patent upon the original filing of this
3 lawsuit in December 2011, as the original complaint included a copy of the '431 patent.

4 86. Applied Biosystems' knowledge of the '431 patent would immediately give
5 it knowledge that use of its Ion Torrent platform products infringe the '431 patent,
6 because the plain language of the '431 patent claims plainly covers use of the Ion
7 Torrent products, as shown in Exhibit B to the attached complaint. At a minimum,
8 Applied Biosystems' activities demonstrate that it has been at least willfully blind with
9 respect to whether its activities cause its customers to infringe.

10 87. Applied Biosystems' products that are the "material or apparatus for use in
11 practicing a patented invention" include, for example, semiconductor chips (such as the
12 Ion 314, 316, 318, Ion PI/PII, or and Ion 520, 530, 540 Chips), reagents and kits for
13 attaching DNA to beads (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM
14 Sequencing 300 Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit, Ion
15 PGM Hi-Q Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit), and
16 instruments for facilitating the attachment of DNA to beads and/or for loading the
17 beads onto the semiconductor chip (such as the IonChef, Ion OneTouch and
18 OneTouch 2 Systems). These products, both individually and collectively, constitute a
19 material part of the invention because when either Applied Biosystems or its customers
20 use them in the manner set forth in Applied Biosystems' instructions, that use infringes
21 the '431 patent. Further detail regarding how Applied Biosystems and its customers use
22 the products to infringe can be found in the claim chart attached as Exhibit B to this
23 complaint and incorporated by reference here and in Life Technologies' documents
24 themselves, which are attached as Exhibits C-Z and incorporated by reference here. In
25 fact, use of Applied Biosystems' Ion Torrent platform products would necessarily
26 infringe the '431 patent, because, on information and belief, there is no other way to use
27 the products other than the infringing way described in Exhibit B to the attached
28

1 complaint. Accordingly, Applied Biosystems is liable to Illumina as a contributory
2 infringer under 35 U.S.C. § 271(c), both literally and under the doctrine of equivalents.

3 88. In addition, the allegations described above at paragraphs 60 to 69 for Life
4 Technologies' contributory infringement of the '431 patent apply equally to Applied
5 Biosystems' contributory infringement of the '431 patent because, on information and
6 belief, Life Technologies also marketed, sold, and provided product literature and
7 services through its wholly-owned subsidiary Applied Biosystems, among other named
8 Defendants.

9 **Applied Biosystems' Willful Infringement**

10 89. Applied Biosystems' infringing acts are willful in that it has knowledge of
11 Illumina's rights under the '431 Patent, but has continued to infringe, and actively
12 induce and contribute to infringement by others. Applied Biosystems has known of the
13 '431 patent since at least December 16, 2010 through its parent Life Technologies'
14 prosecution of certain patent applications, such as U.S. Patent Application No.
15 12/691,923, which contained an Information Disclosure Statement from March 15,
16 2010 disclosing the '431 patent (Ex. FF). Moreover, Applied Biosystems has had
17 knowledge of the '431 patent at least since this case was filed in December 2011, as the
18 original complaint included a copy of the '431 patent. On information and belief,
19 Applied Biosystems knew that use of its products infringed the '431 patent, as any
20 comparison between the plain language of the claim terms and its products would lead
21 to this conclusion.

22 90. Despite all its knowledge, Applied Biosystems has continued to make, use,
23 and sell the Ion Torrent line of products and instructed its customers to use those
24 products in a manner that infringes. On information and belief, Applied Biosystems
25 has taken no steps to design around the '431 patent or to change the design of its
26 products such that it would no longer infringe the '431 patent. Applied Biosystems is
27 aware that the U.S. Patent and Trademark Office has rejected its arguments that the
28 '431 patent is invalid in response to three separate reexamination requests filed by it and

1 certain other named Defendants. Applied Biosystems' infringement is thus egregious,
2 willful, and in bad faith, because it knows it is plainly infringing a valid patent.

3 91. Applied Biosystems' infringing acts have damaged and are continuing to
4 cause damage to Illumina and have caused and are continuing to cause irreparable harm
5 to Illumina unless permanently enjoined by this Court.

6 **Thermo Fisher Scientific's Infringement of the '431 patent**

7 92. Since at least its acquisition of Life Technologies in 2014, Thermo Fisher
8 Scientific has been and is making, using, selling, and offering to sell within the United
9 States the Ion Torrent instruments, reagents, kits and services for sequencing using
10 dense arrays of beads without optical signatures, thereby infringing, both directly and
11 indirectly, one or more claims of the '431 Patent. On information and belief, Thermo
12 Fisher Scientific continued the infringing activities of Life Technologies and Ion
13 Torrent Systems. Thermo Fisher has and does directly infringe the '431 patent by
14 performing all the steps of the claimed methods with the products identified below. In
15 addition, Thermo Fisher has and does induce and contribute to infringement by
16 customers by instructing and encouraging those customers (examples of which are
17 identified below in paragraphs 101-102) to perform all the steps of the claimed methods
18 (using the products identified below in paragraph 93). Exhibit B to this complaint sets
19 forth a chart demonstrating how Thermo Fisher and others who use the Ion Torrent
20 products meet each element of the asserted claims of the '431 patent. We incorporate
21 Exhibit B by reference into this Complaint.

22 **Thermo Fisher's Direct Infringement**

23 93. Thermo Fisher's direct infringement includes using the Ion Torrent
24 technology platform products—such as the Ion Personal Genome Machine (PGM™),
25 Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and Ion Chef™
26 systems and instruments, and related accessories such as chips (*e.g.* Ion 314, 316, 318
27 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (*e.g.* Ion Sphere Particles), and
28 kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing 300 Kit, Ion

1 PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit, Ion
2 PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit)—to perform semiconductor
3 sequencing. On information and belief, Thermo Fisher’s activities in this regard
4 included (and include) using those products in the manner shown in Exhibit B to this
5 complaint, which is incorporated by reference here. For example, on information and
6 belief, Thermo Fisher performed internal testing on its products, and those internal
7 tests included performing the patented method as described in the chart in Exhibit B to
8 this complaint. Thermo Fisher thus directly infringes the ’431 patent under 35 U.S.C.
9 § 271(a), both literally and under the doctrine of equivalents.

10 94. Thermo Fisher publishes user manuals and other materials instructing
11 customers to use these products by attaching nucleic acids to the beads, loading a
12 solution containing the beads onto one of the semiconductor chips, and centrifuging
13 the semiconductor chip so that each bead falls into a well on the chip. Examples of
14 such materials are attached to this complaint as Exhibits V-Z, and we incorporate each
15 of those by reference into the complaint. Once the chip has been prepared in this
16 manner, Thermo Fisher then instructs customers to use the chip for sequencing in one
17 of its sequencing instruments, including the Personal Genome Machine (PGM™), Ion
18 Proton™, Ion S5™, Ion S5™ XL. Anyone who follows Thermo Fisher’s instructions
19 for how to use the products in paragraph 93, including Thermo Fisher itself, directly
20 infringes the ’431 patent, as demonstrated by the claim chart that is attached as Exhibit
21 B to this complaint, which we incorporate by reference into the complaint.

22 95. Thermo Fisher and its customers use the products identified above to
23 directly infringe at least claims 1-3, 13, 14, 16, 17, 25, 59-61, 64, 65, 67, 68, and 76 of the
24 ’431 patent. Thermo Fisher’s website shows that it uses the products itself this way in
25 at least two circumstances—(1) when it helps customers test and validate that the
26 accused Ion Torrent products are working, and (2) when it is performing sequencing
27 internally as part of the sequencing services offered to customers. For example,
28 Thermo Fisher’s website describes a service that ensures several of the accused Ion

1 Torrent products are “installed according to the stringent specifications set by Life
2 Technologies” and another service that “verifies and records” the capacity of several
3 accused devices “to meet specified performance criteria after installation, repetitive use,
4 relocation of the instrument, or major service events.” *See*
5 [http://www.thermofisher.com/us/en/home/products-and-](http://www.thermofisher.com/us/en/home/products-and-services/services/instrument-qualification-services/compliance-and-validation/instrument-iq-oq-ipv.html)
6 [services/services/instrument-qualification-services/compliance-and-](http://www.thermofisher.com/us/en/home/products-and-services/services/instrument-qualification-services/compliance-and-validation/instrument-iq-oq-ipv.html)
7 [validation/instrument-iq-oq-ipv.html](http://www.thermofisher.com/us/en/home/products-and-services/services/instrument-qualification-services/compliance-and-validation/instrument-iq-oq-ipv.html) (describing the instrument validation and
8 qualification services); *see also* [http://www.thermofisher.com/us/en/home/products-](http://www.thermofisher.com/us/en/home/products-and-services/services/instrument-qualification-services/instrument-services.html)
9 [and-services/services/instrument-qualification-services/instrument-services.html](http://www.thermofisher.com/us/en/home/products-and-services/services/instrument-qualification-services/instrument-services.html)
10 (stating those “IQ/OQ/IPV” services are available for the accused “Ion Torrent PGM
11 Sequencer and Proton System” platforms). Likewise, Thermo Fisher’s website shows
12 that Thermo Fisher uses the accused Ion Torrent products to offer sequencing services
13 to customers who do not wish to purchase a device themselves. *See*
14 [http://www.thermofisher.com/us/en/home/life-science/pcr/real-time-pcr/custom-](http://www.thermofisher.com/us/en/home/life-science/pcr/real-time-pcr/custom-services-reagents-real-time-pcr-qpcr/custom-laboratory-services-real-time-pcr.html)
15 [services-reagents-real-time-pcr-qpcr/custom-laboratory-services-real-time-pcr.html](http://www.thermofisher.com/us/en/home/life-science/pcr/real-time-pcr/custom-services-reagents-real-time-pcr-qpcr/custom-laboratory-services-real-time-pcr.html)
16 (offering custom laboratory services for “NGS” (Next-generation sequencing));
17 [http://www.thermofisher.com/us/en/home/products-and-](http://www.thermofisher.com/us/en/home/products-and-services/services/instrument-qualification-services/instrument-services.html)
18 [services/services/instrument-qualification-services/instrument-services.html](http://www.thermofisher.com/us/en/home/products-and-services/services/instrument-qualification-services/instrument-services.html)
19 (categorizing the accused Ion Torrent PGM Sequencer and Proton System, the Ion
20 Chef System, and the Ion S5 and S5 XL Systems as Next-generation sequencing
21 devices). Thermo Fisher’s performance of these testing and service activities for Ion
22 Torrent products requires it to necessarily perform all of the patented steps, as, again,
23 using the Ion Torrent products as described in Thermo Fisher’s manuals infringes at
24 least claims 1-3, 13, 14, 16, 17, 59-61, 64, 65, 67, and 68 of the ’431 patent. *See* Exhibit
25 B to this complaint.

26 **Thermo Fisher’s Induced Infringement**

27 96. Thermo Fisher has been and is making, using, selling or offering to sell
28 Ion Torrent technology platform products-such as the Ion Personal Genome Machine

1 (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and
2 Ion Chef™ systems and instruments, and related accessories such as chips (e.g. Ion
3 314, 316, 318 chips, Ion PI/PII, and Ion 520, 530, 540 chips) beads (e.g. Ion Sphere
4 Particles), and kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing
5 300 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200
6 Kit, Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit). Thermo Fisher has
7 provided users' manuals and instructions for operating the platforms to customers that
8 encourage those customers to use the products in a manner, as illustrated in Exhibit B,
9 that directly infringes the '431 patent. For example, Thermo Fisher has provided these
10 instructions on its website, as noted in paragraph 7 above. And on information and
11 belief, all of Thermo Fisher's customers did and do follow the product-use instructions
12 provided by Thermo Fisher. Thermo Fisher's actions constitute active inducement of
13 its customers (such as the entities listed in paragraphs 57-58 and at
14 [http://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-](http://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-providers-program.html)
15 [sequencing/certified-service-providers-program.html](http://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-providers-program.html)) to infringe the '431 patent in
16 violation of 35 U.S.C. § 271(b), both literally and under the doctrine of equivalents.

17 97. Thermo Fisher has had knowledge of the '431 patent at least since its
18 acquisition of Ion Torrent in February 2014, because, on information and belief,
19 Thermo Fisher, through its whole ownership of Ion Torrent, Life Technologies, and
20 Applied Biosystems, assumed legal liability for all knowledge and acts for which Ion
21 Torrent, Life Technologies, and Applied Biosystems had previously been responsible.

22 *See*

23 [https://www.sec.gov/Archives/edgar/data/97745/000009774514000014/tmok2013.ht](https://www.sec.gov/Archives/edgar/data/97745/000009774514000014/tmok2013.htm)
24 [m](https://www.sec.gov/Archives/edgar/data/97745/000009774514000014/tmok2013.htm) (Thermo Fisher's 10-K for fiscal year 2013 listing *Illumina, Inc. v. Life Technologies Corp.,*
25 *Applied Biosystems, LLC & Ion Torrent Systems, Inc.*, SD-Cal. Case No. 11-cv-3022 as a
26 pending lawsuit wherein “[a]n unfavorable outcome in one or more of these matters
27 could have a material adverse effect on the company's results of operations, financial
28 position or cash flows.”). Moreover, on information and belief, Thermo Fisher knew

1 that this lawsuit was pending at the time of the acquisition and thus knew both about
2 the '431 patent and the allegations of infringement made against the companies it was
3 acquiring, including knowledge of the original complaint filed in December 2011 that
4 included a copy of the '431 patent. Despite this knowledge, Thermo Fisher has
5 continued to affirmatively sell and offer to sell the products in its Ion Torrent
6 technology platforms to present and to affirmatively encourage and instruct customers
7 to use those products in a manner that infringes the '431 patent.

8 98. Moreover, Thermo Fisher has known that the activities it is encouraging
9 infringe the '431 patent. Thermo Fisher's infringement would be plain to it based on
10 even a cursory comparison of the '431 patent claims with the activities that Thermo
11 Fisher and its customers (examples of which are identified in this complaint) undertake
12 with respect to the Ion Torrent sequencing products identified in this complaint.
13 Thermo Fisher has not taken any steps to stop inducing infringement with those
14 entities, and Thermo Fisher's website still lists all of those entities as customers,
15 showing that Thermo Fisher has continued to induce infringement. At a minimum,
16 Thermo Fisher's activities demonstrate that it has been willfully blind with respect to
17 whether its activities cause its customers to infringe.

18 99. For example, Thermo Fisher's user manuals and other materials instruct
19 its customers to use the Ion Torrent platforms by attaching DNA to beads using kits
20 and reagents (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing 300
21 Kit, Ion PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit,
22 Ion PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit) and instruments (such as
23 the IonChef, Ion OneTouch and OneTouch 2 Systems), and then loading those beads
24 into wells on a semiconductor chip (such as the Ion 314, 316, 318 Chips and Ion
25 PI/PII Chips), and then centrifuging the chip so that each bead associates with one of
26 the wells on the semiconductor chip. When customers use the product in that manner
27 as instructed by Thermo Fisher, they directly infringe the '431 patent. Examples of user
28

1 manuals and other materials that contain these instructions are attached to this
2 complaint as Exhibits V-Z, and we incorporate those by reference into the complaint.

3 100. Thermo Fisher's user manuals tell customers that they have a limited right
4 to use the products and must do so "only in accordance with the manuals and written
5 instructions provided by Life Technologies and/or its affiliates." *See, e.g.*, Ex. C at 101;
6 <http://tools.thermofisher.com/content/sfs/manuals/4477181A.pdf>. This further
7 demonstrates that Thermo Fisher intends for customers to use the products in the exact
8 way described in the user manuals, which means that the customers use the products to
9 directly infringe the '431 patent.

10 101. On information and belief, all of Thermo Fisher's customers follow those
11 instructions, and, when they do so, the customers directly infringe the '431 patent.
12 Over 20 examples of Thermo Fisher's customers who use the Ion Torrent products to
13 directly infringe the '431 patent are identified on Thermo Fisher's website, including
14 Affiliated Genetics, Althea Dx, Cedars Sinai, Children's Hospital Los Angeles, Claritas
15 Genomics, Eureka Genomics, Gene Dx, GENEWIZ, Memorial Sloan-Kettering
16 Cancer Center, The Molecular Resource Center, Ohio State University, PrimBio
17 Research Institute, Research and Testing Laboratory, Roswell Park Cancer Institute,
18 RUCDR Infinite Biologics, Sanford Burnham, Selah Genomics, SeqWright Genomic
19 Services, University of Arizona, University of New Mexico, MACROGEN, Indiana
20 University School of Medicine, San Diego State University, and Baylor College of
21 Medicine. *See, e.g.*, [http://www.thermofisher.com/us/en/home/life-](http://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-providers-program.html)
22 [science/sequencing/next-generation-sequencing/certified-service-providers-](http://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-providers-program.html)
23 [program.html](http://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-providers-program.html). Thermo Fisher's website identifies these organizations as "Ion
24 Torrent™ Certified Service Providers" who, for example, offer sequencing services
25 using the accused Ion Proton™ System to demonstrate them for others who may wish
26 to evaluate "results from an Ion Proton™ System before investing one of their own."
27 *See* [http://www.thermofisher.com/us/en/home/life-science/sequencing/next-](http://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-providers-program.html)
28 [generation-sequencing/certified-service-providers-program.html](http://www.thermofisher.com/us/en/home/life-science/sequencing/next-generation-sequencing/certified-service-providers-program.html). These customers thus

1 use Thermo Fisher’s products as instructed to directly infringe the ’431 patent. And
2 Thermo Fisher induces those customers to infringe by, for example, providing the Ion
3 Torrent products that are used to infringe and instructing customers to use them in an
4 infringing manner.

5 102. Thermo Fisher’s website includes videos that identify still other users of
6 its products, like AIBio Tech®, which explained it uses Thermo Fisher’s Ion Torrent
7 products, runs about 700-1,000 samples per week, had early access to the Ion Chef, and
8 was instructed by Thermo Fisher to “see if you can run this instrument into the
9 ground” by running non-stop on multiple chips at a time. *See*
10 https://www.youtube.com/watch?feature=player_embedded&v=jTcLtcfH8Eg. Thus,
11 AIBio Tech is another example of a customer who directly infringes the ’431 patent.
12 Thermo Fisher induced AIBio Tech® to infringe by, for example, providing the Ion
13 Torrent products that are used to infringe and instructing AIBio Tech® to use them in
14 an infringing manner.

15 16 **Thermo Fisher’s Contributory Infringement**

17 103. Thermo Fisher has been and is making, using, selling or offering to sell the
18 Ion Torrent products—such as the Ion Personal Genome Machine (PGM™), Ion
19 Proton™, Ion S5™, Ion S5™ XL, OneTouch™, OneTouch™ 2 and Ion Chef™
20 systems and instruments, and related accessories such as chips (*e.g.* Ion 314, 316, 318
21 chips, Ion PI/PII, and Ion 520, 530, 540 chips,) beads (*e.g.* Ion Sphere Particles), and
22 kits (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing 300 Kit, Ion
23 PGM Hi-Q Kit, Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit, Ion
24 PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit)—that its customers use to
25 infringe the claims of the ’431 patent.

26 104. Thermo Fisher is making, using, selling or offering to sell these Ion
27 Torrent products knowing that the products are all especially made and adapted for use
28 in infringing the claims of the ’431 patent, and that the platforms and related products

1 are not staple articles or capable of a substantial noninfringing use. For example, the
2 Ion Chips, Ion Sphere Particles, and Ion Chef™ are made so that a customer will use
3 them to infringe the '431 patent claims by contacting the surface of one of the Ion
4 Chips (which contain wells with at least density recited in the claims) with a solution
5 containing the Ion Sphere Particles (which do not comprise an optical signature), and
6 then applying energy to the solution (by, for example, using the Ion Chef™ system) so
7 that the Ion Sphere Particles randomly associate into the depressions on the Ion Chip.
8 A customer must perform this step in order to use any of these products for their
9 ultimate intended purpose, which is to sequence fragments of DNA using the beads-in-
10 wells arrangement with the Ion Personal Genome Machine (PGM™), Ion Proton™,
11 Ion S5™, Ion S5™ XL sequencing systems. The Ion Chips, Ion Sphere Particles, and
12 Ion Chef do not have any other noninfringing use. Customers do in fact use them to
13 infringe the '431 patent claims as shown in Exhibit B to this complaint. Accordingly,
14 Thermo Fisher is liable to Illumina as a contributory infringer under 35 U.S.C. § 271(c),
15 both literally and under the doctrine of equivalents.

16 105. Thermo Fisher has had knowledge of the '431 patent at least since it
17 acquired Life Technologies in February 2014 because, on information and belief,
18 Thermo Fisher, through its whole ownership of Ion Torrent, Life Technologies, and
19 Applied Biosystems, assumed legal liability for all knowledge and acts for which Ion
20 Torrent, Life Technologies, and Applied Biosystems had previously been responsible.
21 *See*
22 [https://www.sec.gov/Archives/edgar/data/97745/000009774514000014/tmok2013.ht](https://www.sec.gov/Archives/edgar/data/97745/000009774514000014/tmok2013.htm)
23 [m](https://www.sec.gov/Archives/edgar/data/97745/000009774514000014/tmok2013.htm) (Thermo Fisher's 10-K for fiscal year 2013 listing *Illumina, Inc. v. Life Technologies Corp.,*
24 *Applied Biosystems, LLC & Ion Torrent Systems, Inc.*, SD-Cal. Case No. 11-cv-3022 as a
25 pending lawsuit wherein "[a]n unfavorable outcome in one or more of these matters
26 could have a material adverse effect on the company's results of operations, financial
27 position or cash flows."). Moreover, on information and belief, Thermo Fisher knew
28 that this lawsuit was pending at the time of the acquisition and thus knew both about

1 the '431 patent and the allegations of infringement made against the companies it was
2 acquiring, including knowledge of the original complaint filed in December 2011 that
3 included a copy of the '431 patent. Despite this knowledge, Thermo Fisher has
4 continued to affirmatively sell and offer to sell the products in its Ion Torrent platforms
5 and to affirmatively encourage and instruct customers to use those products in a
6 manner that infringes the '431 patent. Moreover, Thermo Fisher has known that the
7 activities it is encouraging infringe the '431 patent. Thermo Fisher's infringement
8 would be plain to it based on even a cursory comparison of the '431 patent claims with
9 the activities that Thermo Fisher and its customers undertake with respect to the Ion
10 Torrent sequencing products identified in this complaint. Moreover, on January 26,
11 2015, Illumina served several entities associated with Thermo Fisher (*i.e.*, Life
12 Technologies, Applied Biosystems, and Ion Torrent Systems) with claim charts
13 demonstrating infringement on an element-by-element basis. Yet Thermo Fisher has
14 continued to affirmatively sell and offer to sell the accused products and to affirmatively
15 encourage and instruct customers to use those products in a manner that infringes the
16 '431 patent. Thermo Fisher has not taken any steps to stop supplying its customers
17 with the products necessary to infringe nor has it stopped instructing them to infringe.
18 Moreover, Thermo Fisher's website still lists all of those entities as customers, showing
19 that Thermo Fisher has continued to contributorily infringe. At a minimum, Thermo
20 Fisher's activities demonstrates that it has been at least willfully blind with respect to
21 whether its activities cause its customers to infringe.

22 106. Thermo Fisher's products that are the "material or apparatus for use in
23 practicing a patented invention" include semiconductor chips (such as the Ion 314, 316,
24 318, Ion PI/PII, or and Ion 520, 530, 540 Chips), reagents and kits for attaching DNA
25 to beads (such as the Ion Bead Kits, Ion Sphere Kits, Ion PGM Sequencing 300 Kit,
26 Ion PGM Sequencing 200 Kit, Ion PGM Sequencing 200 Kit, Ion PGM Hi-Q Kit, Ion
27 PGM IC 200 Kit, Ion 520 and 530 Kit, and Ion 540 Kit), and instruments for
28 facilitating the attachment of DNA to beads and/or for loading the beads onto the

1 semiconductor chip (such as the IonChef, Ion OneTouch and OneTouch 2 Systems).
2 These products, both individually and collectively, constitute a material part of the
3 invention because when either Thermo Fisher or its customers use them in the manner
4 set forth in Thermo Fisher's user manuals and other instructions, that use infringes the
5 '431 patent. Further detail regarding how Thermo Fisher and its customers use the
6 products to infringe, along with examples from Thermo Fisher's user manuals and
7 other materials, can be found in the claim chart attached as Exhibit B to this complaint
8 and incorporated by reference here and in Thermo Fisher's documents themselves,
9 which are attached as Exhibits V-Z and incorporated by reference here.

10 107. Thermo Fisher knows that the products listed above are especially made
11 or especially adapted for use in an infringement of the '431 patent, and not a staple
12 article or commodity of commerce suitable for substantial noninfringing use. As
13 alleged above, Thermo Fisher has known of the '431 patent since at least February
14 2014. Moreover, Thermo Fisher has continued to sell the products and instruct
15 customers to use them in a manner that it knows infringes the '431 patent. Indeed,
16 Thermo Fisher's user manuals tell customers that it has a limited right to use the
17 products and must do so "only in accordance with the manuals and written instructions
18 provided by Life Technologies and/or its affiliates." *See, e.g.*, Ex. C at 101. The only
19 manner in which the manuals and written instructions describe use the products is to
20 load the beads onto a semiconductor chip in a way that infringes the '431 patent. None
21 of Thermo Fisher's user manuals or other written description describe any way to use
22 the products listed above in a way that does not infringe. Therefore, Thermo Fisher
23 knows its products are especially made or especially adapted for an infringing use and
24 do not have any noninfringing use whatsoever.

25 108. Upon information and belief, practice of the methods claimed in the '431
26 Patent are important for the commercial acceptance of Thermo Fisher's Ion Personal
27 Genome Machine (PGM™), Ion Proton™, Ion S5™, Ion S5™ XL, Ion OneTouch™,
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1 Ion OneTouch™ 2, and Ion Chef™ systems, instruments, and accessories, including
2 related chips and kits.

3 **Thermo Fisher's Willful Infringement**

4 109. Thermo Fisher's infringing acts are willful in that it has knowledge of
5 Illumina's rights under the '431 Patent, but has continued to infringe, and actively
6 induce and contribute to infringement by others. Thermo Fisher has had knowledge of
7 the '431 patent at least since its acquisition of Life Technologies in February 2014,
8 because, on information and belief, Thermo Fisher, through its whole ownership of Ion
9 Torrent, Life Technologies, and Applied Biosystems, assumed legal liability for all
10 knowledge and acts for which Ion Torrent, Life Technologies, and Applied Biosystems
11 had previously been responsible. Moreover, on information and belief, Thermo Fisher
12 knew that this lawsuit was pending at the time of the acquisition and thus knew both
13 about the '431 patent and the allegations of infringement made against the companies it
14 was acquiring, including knowledge of the original complaint filed in December 2011
15 that included a copy of the '431 patent. Yet, Thermo Fisher has continued to make,
16 use, and sell the Ion Torrent line of products and instructed its customers to use those
17 products in a manner that infringes. Thermo Fisher's subsidiaries were also served with
18 a detailed claim chart demonstrating how they (and Thermo Fisher itself) directly and
19 indirectly infringe the '431 patent on January 26, 2015. On information and belief,
20 Thermo Fisher has taken no steps to design around the '431 patent or to change the
21 design of its products such that it would no longer infringe the '431 patent. Moreover,
22 on information and belief, Thermo Fisher is aware that the U.S. Patent and Trademark
23 Office has rejected its named subsidiary-Defendants' arguments that the '431 patent is
24 invalid in response to three separate reexamination requests. Thermo Fisher's
25 infringement is thus egregious, willful, and in bad faith, because it knows it is plainly
26 infringing a valid patent.

1 110. Thermo Fisher’s infringing acts have damaged and are continuing to cause
2 damage to Illumina and have caused and are continuing to cause irreparable harm to
3 Illumina unless permanently enjoined by this Court.

4 **VI. PRAYER FOR RELIEF**

5 Illumina demands judgment against Defendants as follows:

6 A. A declaration that Defendants have infringed the ’431 Patent, both directly
7 and indirectly, under 35 U.S.C. §§ 271(a), (b), and (c), both literally and under the
8 doctrine of equivalents;

9 B. A permanent injunction enjoining Defendants, their officers, agents,
10 servants, employees, attorneys, and those persons in active concert or participation with
11 any of them, from infringing in any manner the Patent-in-Suit;

12 C. A declaration that Defendants’ infringement of the ’431 patent is willful;

13 D. An accounting for damages by virtue of Defendants’ infringement of the
14 ’431 Patent;

15 E. An assessment of pre-judgment and post-judgment interest and costs
16 against Defendants, together with an award of such interest and costs, in accordance
17 with 35 U.S.C. § 284;

18 F. A declaration that this is an exceptional case under 35 U.S.C. § 285 and an
19 award of treble damages and reasonable actual attorneys’ fees; and

20 G. Such other and further relief as this Court may deem just and proper.
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1 **VII. JURY DEMAND**

2 Illumina demands a trial by jury on all issues properly tried to a jury.

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4 Dated: October 20, 2016

FISH & RICHARDSON P.C.

5
6 By: /s/ Craig E. Countryman
7 Craig E. Countryman (SBN 244601)
8 countryman@fr.com

9 Attorneys for Plaintiff ILLUMINA, INC.

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CERTIFICATE OF SERVICE

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The undersigned hereby certifies that a true and correct copy of the above and foregoing document has been served on October 20, 2016 to all counsel of record who are deemed to have consented to electronic service via the Court's CM/ECF system per Fed. R. Civ. P. 5(b)(3). Any other counsel of record will be served by electronic mail, facsimile and/or overnight delivery.

Dated: October 20, 2016

By: /s/ Craig E. Countryman
Craig E. Countryman