IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

454 LIFE SCIENCES CORPORATION, Plaintiff, v. ION TORRENT SYSTEMS, INC., LIFE TECHNOLOGIES CORP. AND THERMO FISHER SCIENTIFIC, INC., Defendants.	)	C.A. No. 15-595-LPS-CJB **JURY TRIAL DEMANDED**

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

1. Plaintiff 454 Life Sciences Corporation, by its attorneys, for its Complaint in this action alleges against Defendants Ion Torrent Systems, Inc., Life Technologies Corporation and Thermo Fisher Scientific, Inc. (collectively, "Defendants") as follows:

PARTIES AND JURISDICTION

2. 454 Life Sciences Corporation ("454"), is a corporation organized and existing under the laws of the State of Delaware, having its principal place of business at 15 Commercial Street, Branford, Connecticut 06405.

3. Ion Torrent Systems, Inc. ("Ion Torrent") is a corporation organized and existing under the laws of the State of Delaware, having its principal place of business at 180 Oyster Point Blvd, South San Francisco, California 94080. Ion Torrent is a wholly owned subsidiary of Life Technologies Corporation ("Life Technologies").

4. Life Technologies is a corporation organized and existing under the laws of the State of Delaware, having its principal place of business at 5791 Van Allen Way, Carlsbad, California 92008. Life Technologies is a wholly owned subsidiary of Thermo Fisher Scientific Inc. ("Thermo Fisher").

5. Thermo Fisher is a corporation organized and existing under the laws of the State of Delaware, having its principal place of business at 81 Wyman Street, Waltham, Massachusetts 02451.

6. This action arises under the Patent Act of 1952, as amended, 35 U.S.C. §§ 1 et seq.

7. This Court has jurisdiction to hear this action under 28 U.S.C. §§ 1331, 1338(a), and 1367.

THE PATENTS-IN-SUIT

8. 454 is the owner by assignment of U.S. Patent No. 7,323,305 (the "'305 Patent"), entitled, "Methods of Amplifying and Sequencing Nucleic Acids," which was duly and legally issued by the United States Patent and Trademark Office on January 29, 2008. The '305 Patent issued from United States Patent Application Serial No. 10/767,779, filed on January 28, 2004. A true and correct copy of the '305 Patent is attached hereto as Exhibit A.

9. 454 is the owner by assignment of U.S. Patent No. 8,748,102 (the "'102 Patent"), entitled, "Bead Emulsion Nucleic Acid Amplification," which was duly and legally issued by the United States Patent and Trademark Office on June 10, 2014. The '102 Patent issued from United States Patent Application Serial No. 10/767,899, filed on January 28, 2004, through a series of continuation applications. A true and correct copy of the '102 Patent is attached hereto as Exhibit B.

10. 454 is the owner of by assignment of U.S. Patent No. 8,765,380 (the "'380 Patent"), entitled, "Bead Emulsion Nucleic Acid Amplification," which was duly and legally issued by the United States Patent and Trademark Office on July 1, 2014. The '380 Patent issued from United States Patent Application Serial No. 10/767,899, filed on January 28, 2004,

through a series of continuation applications. A true and correct copy of the ’380 Patent is attached hereto as Exhibit C.

FIRST CLAIM FOR RELIEF
INFRINGEMENT OF THE ‘305 PATENT

11. The allegations in the foregoing paragraphs of this Complaint are incorporated by reference herein as if restated and set forth in full.

12. The ‘305 Patent discloses and claims embodiments of a process called “emulsion PCR” for simultaneously amplifying multiple nucleic acids, such as DNA, in a single reaction tube. Emulsion PCR was a major advance in the field of DNA amplification and, in one application, enabled scientists to determine the sequences of DNA molecules much more rapidly and cheaply than had been possible using prior DNA sequencing techniques.

13. Defendants make, offer for sale and sell in the United States (and have made, sold and offered in the United States) (a) machines for use in performing emulsion PCR and sequencing the products of emulsion PCR (such as the (1) Ion OneTouch™ 2 System comprising the One Touch™ 2 Instrument and the One Touch™ ES, (2) Ion Chef™ System, (3) Ion Personal Genome Machine (PGM)™ System, (4) Ion Proton™ System, and (5) Ion Chip™ Minifuge), as well as (b) chips that are designed to be used with the foregoing machines in sequencing the products of emulsion PCR (such as those sold under the designations (1) Ion 314™ Chip Kit v2, (2) Ion 314™ Chip Kit v2 BC, (3) Ion 316™ Chip Kit, (4) Ion 316™ Chip Kit v2, (5) Ion 316™ Chip Kit v2 BC, (6) Ion 318™ Chip Kit, (7) Ion 318™ Chip Kit v2, (8) Ion 318™ Chip Kit v2 BC, (9) Ion PI™ Chip Kit v2, (10) Ion PI™ Chip Kit v2 BC, (11) Ion PI™ Chip Kit v3, (12) Ion ReproSeq™ PGS 316 Kit, (13) Ion ReproSeq™ PGS 318 Kit, (14) Ion ReproSeq™ PGS 314 Kit, (15) Ion 520™ Chip Kit, (16) Ion 540™ Chip Kit, (17) Ion 530™ Chip Kit, (18) Ion AmpliSeq™ Exome Kit 8xTrio, (19) Ion AmpliSeq™ Exome Kit 4xDuo, (20)

Ion AmpliSeq™ Exome RDY - OT2 Kit 4x2, (21) Ion AmpliSeq™ Exome RDY - OT2 Kit 1x8, (22) Ion AmpliSeq™ Exome RDY - IC Kit 4x2, (23) Ion AmpliSeq™ Exome RDY Kit 1x8, (24) Ion AmpliSeq™ Exome RDY Kit 4x2, (25) Ion AmpliSeq™ Exome RDY - IC Kit 1x8, (26) Ion AmpliSeq™ Exome Kit, (27) Ion AmpliSeq™ Exome RDY S5 Kit 4x2, and (28) Ion AmpliSeq™ Exome RDY S5 Kit 1x8).

14. Defendants also make, offer for sale and sell in the United States (and have made, sold and offered in the United States) consumables for use with the foregoing machines and chips in performing emulsion PCR and sequencing the products of emulsion PCR, including (a) adapters (such as the Ion Plus Fragment Library Adapters), (b) library reagents (such as the (1) Ion TrueMate™ Plus Library Kit, (2) Ion Xpress™ Plus Fragment Library Kit, (3) Thermo Scientific® MuSeek™ Library Preparation Kit, (4) Ion Plus Fragment Library Kit, (5) NEBNext Fast DNA Fragmentation & Library Prep Set, (6) NEBNext® Fast DNA Library Prep Set for Ion Torrent 4, (7) ClaSeek Library Preparation Kit, Ion Torrent compatible, (8) Ion Plus Fragment Library Kit for AB Library Builder™ System, (9) Ion Xpress™ Fragment Library Kit for AB Library Builder™ System, (10) Ion Total RNA-Seq v2, (11) Ion Total RNA-Seq Kit for AB® Library Builder™ System, (12) HID-Ion AmpliSeq™ Library Kit, (13) HID-Ion AmpliSeq™ Identity and Library Kit, (14) HID-Ion AmpliSeq™ Ancestry and Library Kit, (15) Ion AmpliSeq™ RNA Library Kit, (16) Ion TrueMate™ Library Kit, (17) Ion AmpliSeq™ Transcriptome Human Gene Expression Kit, (18) Ion AmpliSeq™ Kit for Chef DL8 and AmpliSeq™ Pharmacogenomics Research Chef Ready Kit), (c) amplification reagents (such as the (1) Ion PGM™ Template OT2 400 Kit, (2) Ion PGM™ Template OT2 200 Kit, (3) Ion PI™ Template OT2 200 Kit v3, (4) Ion PI™ Hi-Q™ OT2 200 Kit, (5) Ion PI™ Template OT2 200 Kit v2, (6) Ion PGM™ Hi-Q™ OT2 Kit, (7) Ion PGM™ IC 200 Kit, (8) Ion PGM™ IC 200

Starter Kit, (9) Ion PI™ IC 200 Kit, (10) Ion PGM™ Hi-Q™ Chef Kit and (11) Ion PI Hi-Q Chef Kit), (d) control reagents (such as the (1) Ion Control Materials 200 Kit, (2) Ion S5™ Calibration Standard, (3) Ion S5™ Controls Kit, (4) Ion PI™ Controls 200 Kit, (5) Ion PGM™ Controls Kit and (6) Ion Sphere™ Quality Control Kit), (e) sequencing reagents (such as the (1) Ion PGM™ Hi-Q™ Sequencing Kit, (2) Ion PGM™ Hi-Q™ Chef Sequencing Kit, (3) Ion PGM™ Hi-Q™ Chef 400 Supplies Kit, (4) Ion PGM™ Sequencing 200 Kit v2, (5) Ion PGM™ Sequencing 400 Kit, (6) Ion PI™ Sequencing 200 Kit v3, (7) Ion PI™ Hi-Q™ Sequencing 200 Kit, (8) Ion PI™ Hi-Q™ OT2 200 Kit, (9) Ion PI™ Sequencing 200 Kit v2, (10) Ion 540™ Kit-Chef, (11) Ion 540™ Kit-OT2, (12) Ion 520™/530™ Kit-Chef, (13) Ion 520™/530™ Kit-OT2, (14) Ion 520™/530™ Kit-Chef, (15) Ion ReproSeq™ PGS 314 Kit, (16) Ion ReproSeq™ PGS 318 Kit, and (17) Ion ReproSeq™ PGS 316 Kit), (f) targeted primer panels and pools (such as the (1) Ion AmpliSeq™ Inherited Disease Panel, (2) Ion AmpliSeq™ Cancer Hotspot Panel v2, (3) Ion AmpliSeq™ Cancer Panel Primer Pool, (4) Ion AmpliSeq™ Comprehensive Cancer Panel, (5) Ion AmpliSeq™ Sample ID Panel, (6) HID-Ion AmpliSeq™ Ancestry Panel, (7) HID-Ion AmpliSeq™ Identity Panel, (8) Ion AmpliSeq™ Pharmacogenomics Research Panel, (9) Ion AmpliSeq™ RNA Cancer Panel and (10) Ion AmpliSeq™ RNA Apoptosis Panel), (g) barcode adapters (such as the (1) Ion Xpress™ Barcode Adapters 1–16 Kit, (2) Ion Xpress™ Barcode Adapters 17-32 Kit, (3) Ion Xpress™ Barcode Adapters 1-96 Kit, (4) Ion Xpress™ Barcode Adapters 33-48 Kit, (5) Ion Xpress™ Barcode Adapters 49-64 Kit, (6) Ion Xpress™ Barcode Adapters 65-80 Kit, (7) Ion Xpress™ Barcode Adapters 81-96 Kit, (8) Ion Xpress™ RNA-Seq Barcode 1-16 Kit, (9) MuSeek Barcode Set 1, Ion Torrent compatible and (10) IonCode™ Barcode Adapters 1-384 Kit), (h) library control reagents (such as the (1) Ion Universal Library

Quantitation Kit, (2) Ion Library Equalizer™ Kit and (3) Ion Library TaqMan™ Quantitation Kit), and (i) enrichment reagents (such as Ion PGM™ Enrichment Beads).

15. Defendants also make, offer for sale and sell in the United States (and have made, sold and offered in the United States) data analysis technology for analyzing data generated by emulsion PCR sequencing, such as the (1) Torrent Suite™ Software, (2) Ion Reporter™ Software, (3) Ion Reporter™ Server, (4) Ion Torrent Storage™ Device, (5) Ion PGM™ Torrent Server and (6) Ion Reporter Server System.

16. Use of the aforesaid machines, chips, consumables and data analysis technology and other products for performing emulsion PCR, sequencing the products of emulsion PCR, or analyzing data generated by emulsion PCR sequencing (collectively, the "Accused Products") by customers and end users in accordance with the accompanying directions, and use of the Accused Products by Defendants in the course of testing, quality control, and customer support and training, directly infringes the '305 Patent under 35 U.S.C. §§ 271(a) and (g).

17. Defendants have been aware of the '305 Patent and that use of the Accused Products in accordance with their accompanying directions infringes the '305 Patent. For example, Jonathan M. Rothberg ("Rothberg") is an inventor of the '305 Patent. After assigning to 454 his invention and the patent applications that ultimately issued as the '305 patent, Rothberg founded or participated in founding Ion Torrent to commercialize the technology he had assigned to 454. Further, Rothberg served as CEO of Ion Torrent both before and after Ion Torrent was acquired by Life Technologies, which in turn was acquired by Thermo Fisher. Rothberg's knowledge concerning the foregoing facts is imputed to the Defendants. Moreover, in the course of licensing discussions that commenced at least as early as 2012, 454 and its affiliates drew Defendants' attention to the '305 Patent and their infringement thereof.

18. The Accused Products have no substantial use other than for performing emulsion PCR, sequencing the products of emulsion PCR, or analyzing data generated by emulsion PCR sequencing. Defendants specifically intended customers and end users to infringe the '305 Patent, as shown by their providing machines, chips, consumables, data analysis technology and other products with no other substantial noninfringing use.

19. Defendants' sale and offer for sale of the Accused Products with the accompanying directions induces infringement of the '305 Patent by customers and other end users.

20. Defendants' sale and offer for sale of the Accused Products contributes to infringement of the '305 Patent.

21. Defendants' direct and indirect infringement of the '305 Patent have caused damage to Plaintiff. Unless enjoined from continuing their infringement of the '305 Patent, Defendants will continue to harm Plaintiff's interests, causing Plaintiff irreparable injury.

22. Defendants' infringement of the '305 Patent has been and continues to be willful and deliberate, entitling Plaintiff to increased damages under 35 U.S.C. § 284 and reasonable attorneys' fees under 35 U.S.C. § 285.

SECOND CLAIM FOR RELIEF
INFRINGEMENT OF THE '102 PATENT

23. The allegations in the foregoing paragraphs of this Complaint are incorporated by reference herein as if restated and set forth in full.

24. The '102 Patent discloses and claims embodiments of emulsion PCR.

25. Use of the aforesaid Accused Products by customers and end users in accordance with the accompanying directions, and use of the Accused Products by Defendants in the course

of testing, quality control, and customer support and training, directly infringes the ‘102 Patent under 35 U.S.C. §§ 271(a) and (g).

26. Defendants have been aware of the ‘102 Patent and that use of the Accused Products in accordance with their accompanying directions infringes ‘102 Patent. For example, Rothberg is an inventor of the ‘102 Patent. After assigning to 454 his invention and the patent applications that ultimately issued as the ‘102 Patent, Rothberg founded or participated in founding Ion Torrent to commercialize the technology he had assigned to 454. Further, Rothberg served as CEO of Ion Torrent both before and after Ion Torrent was acquired by Life Technologies, which in turn was acquired by Thermo Fisher. Rothberg’s knowledge concerning the foregoing facts is imputed to the Defendants. Moreover, in the course of licensing discussions that commenced at least as early as 2012, 454 and its affiliates drew Defendants’ attention to United States Patent Application Serial No. 10/767,899 which ultimately issued as the ‘102 Patent and their infringement thereof.

27. The Accused Products have no substantial use other than for performing emulsion PCR, sequencing the products of emulsion PCR, or analyzing data generated by emulsion PCR sequencing. Defendants specifically intended customers and end users to infringe the ‘102 Patent, as shown by their providing machines, chips, consumables, data analysis technology and other products with no other substantial noninfringing use.

28. Defendant’s sale and offer for sale of the Accused Products with the accompanying directions induces infringement of the ‘102 Patent by customers and other end users.

29. Defendants’ sale and offer for sale of the Accused Products contributes to infringement of the ‘102 Patent.

30. Defendants' direct and indirect infringement of the '102 Patent have caused damage to Plaintiff. Unless enjoined from continuing their infringement of the '102 Patent, Defendants will continue to harm Plaintiff's interests, causing Plaintiff irreparable injury.

31. Defendants' infringement of the '102 Patent has been and continues to be willful and deliberate, entitling Plaintiff to increased damages under 35 U.S.C. § 284 and reasonable attorneys' fees under 35 U.S.C. § 285.

THIRD CLAIM FOR RELIEF
INFRINGEMENT OF THE '380 PATENT

32. The allegations in the foregoing paragraphs of this Complaint are incorporated by reference herein as if restated and set forth in full.

33. The '380 Patent discloses and claims embodiments of emulsion PCR.

34. Use of the aforesaid Accused Products by customers and end users in accordance with the accompanying directions, and use of the Accused Products by Defendants in the course of testing, quality control, and customer support and training, directly infringes the '380 Patent under 35 U.S.C. §§ 271(a) and (g).

35. Defendants have been aware of the '380 Patent and that use of the Accused Products in accordance with their accompanying directions infringes '380 Patent. For example, Rothberg is an inventor of the '380 Patent. After assigning to 454 his invention and the patent applications that ultimately issued as the '380 Patent, Rothberg founded or participated in founding Ion Torrent to commercialize the technology he had assigned to 454. Further, Rothberg served as CEO of Ion Torrent both before and after Ion Torrent was acquired by Life Technologies, which in turn was acquired by Thermo Fisher. Rothberg's knowledge concerning the foregoing facts is imputed to the Defendants. Moreover, in the course of licensing discussions that commenced at least as early as 2012, 454 and its affiliates drew Defendants'

attention to United States Patent Application Serial No. 10/767,899 which ultimately issued as the ‘380 Patent and their infringement thereof.

36. The Accused Products have no substantial use other than for performing emulsion PCR, sequencing the products of emulsion PCR, or analyzing data generated by emulsion PCR sequencing. Defendants specifically intended customers and end users to infringe the ‘380 Patent, as shown by their providing machines, chips, consumables, data analysis technology and other products with no other substantial noninfringing use.

37. Defendant’s sale and offer for sale of the Accused Products with the accompanying directions induces infringement of the ‘380 Patent by customers and other end users.

38. Defendants’ sale and offer for sale of the Accused Products contributes to infringement of the ‘380 Patent.

39. Defendants’ direct and indirect infringement of ‘380 Patent have caused damage to Plaintiff. Unless enjoined from continuing their infringement of the ‘380 Patent, Defendants will continue to harm Plaintiff’s interests, causing Plaintiff irreparable injury.

40. Defendants’ infringement of the ‘380 Patent has been and continues to be willful and deliberate, entitling Plaintiff to increased damages under 35 U.S.C. § 284 and reasonable attorneys’ fees under 35 U.S.C. § 285.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays that the Court:

(a) declare, adjudge and decree that use of the Accused Products by Defendants, their customers and end users directly infringes the Patents-in-Suit and that Defendants’ distribution,

offer for sale and sale of the Accused Products with their accompanying instructions induces and contributes to infringement of the Patents-in-Suit;

(b) award compensatory damages as provided by law, including damages adequate to compensate for infringement arising from Defendants' use, sale and offer for sale of the Accused Products;

(c) issue a permanent injunction pursuant to 35 U.S.C. § 283 and 28 U.S.C. § 1331 restraining and enjoining Defendants and their affiliates, subsidiaries, directors, officers, employees, attorneys, agents, and all persons acting in privity or concert with them, from further acts that infringe, induce infringement, or contribute to infringement of the Patents-in-Suit;

(d) declare, adjudge and decree that this case is exceptional and award Plaintiff its reasonable attorneys' fees and costs pursuant to 35 U.S.C. § 285;

(e) declare, adjudge and decree that Defendants' infringement has been willful and that the damages will be increased under 35 U.S.C. § 284 up to three times the amount found or measured; and

(f) award such other and further relief as this Court may deem just and proper.

JURY TRIAL DEMANDED

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiff demands a trial by jury of all issues triable of right by jury.

Respectfully submitted,

POTTER ANDERSON & CORROON LLP

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