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On behalf of **Illumina, Inc.**

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ILLUMINA, INC.
Petitioner

v.

**THE TRUSTEES OF COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK**
Patent Owner

IPR2018-00322
U.S. Patent 9,708,358

ILLUMINA UPDATED EXHIBIT LIST

Pursuant to 37 C.F.R. § 42.63(e), Petitioner Illumina, Inc. (“Illumina”) provides an updated list of its exhibits in this proceeding.

TABLE OF EXHIBITS

Exhibit No.	Description
1001	<i>Exhibit number not used.</i>
1002	U.S. Patent No. 9,708,358 (“Ju”) – (Claim 1 is a cytosine claim)
1003	<i>Exhibit number not used.</i>
1004	<i>Exhibit number not used.</i>
1005	2014-03-06 IPR2012-00007, Paper 140, Final Written Decision
1006	2014-03-06 IPR2012-00006, Paper 128, Final Written Decision
1007	2014-03-06 IPR2013-00011, Paper 130, Final Written Decision
1008	2015-07-17 Federal Circuit Opinion Affirming IPR2012-00006, IPR2012-00007 and IPR2013-00011
1009	<i>Exhibit number not used.</i>
1010	U.S. Patent No. 7,790,869 (“Ju”)
1011	Alberts et al., “Molecular Biology of the Cell”, Garland Publishing Inc., New York (3d ed., 1994)
1012	<i>Exhibit number not used.</i>
1013	WO 91/06678 (“Tsien”)
1014	Prober et al., “A System for Rapid DNA Sequencing with Fluorescent Chain-Terminating Dideoxynucleotides”, Science, 238:336-341 (1987) (“Prober”)
1015	U.S. Patent No. 5,547,839 (“Dower”)

Exhibit No.	Description
1016	Metzker et al., “Termination of DNA synthesis by novel 3’-modified-deoxyribonucleoside 5’-triphosphates”, Nucleic Acids Research, 22:4259-67 (1994) (“Metzker”)
1017	Wu and Metzker et al., “Termination of DNA synthesis by N6-alkylated, not 3’-O-alkylated, photocleavable 2’-deoxyadenosine triphosphates”, Nucleic Acids Research, 35:6339-6349 (2007) (“Wu and Metzker”)
1018	Sanger et. al., “DNA sequencing with chain-terminating inhibitors”, Proc. Natl. Acad. Sci. USA, 74:5463-5467 (1977) (“Sanger”)
1019	U.S. Patent No. 7,270,951 (“Stemple”)
1020	U.S. Patent No. 5,302,509 (“Cheeseman”)
1021	Pelletier et al., “Structures of Ternary Complexes of Rat DNA Polymerase β , a DNA Template-Primer, and ddCTP”, Science, 264:1891-1903 (1994) (“Pelletier”)
1022	<i>Exhibit number not used.</i>
1023	Welch et al., “Syntheses of Nucleosides Designed for Combinatorial DNA Sequencing”, Chem. Eur. J., 5:951-960 (1999) (“Welch”)
1024	Welch et al., “Corrigenda – Syntheses of Nucleosides Designed for Combinatorial DNA Sequencing”, Chem. Eur. J., 11:7136-7145 (2005) (“Welch Corrigenda”)
1025	<i>Exhibit number not used.</i>
1026	<i>Exhibit number not used.</i>
1027	Rosenblum et al., “New dye-labeled terminators for improved DNA sequencing patterns”, Nucleic Acid Research, 25:4500-4504 (1997) (“Rosenblum”)

Exhibit No.	Description
1028	Excerpts from 2013-09-04 Deposition Transcript of Dr. George L. Trainor in IPR2012-00007
1029	U.S. Patent No. 5,151,507 (“Hobbs”)
1030	<i>Exhibit number not used.</i>
1031	Seela et al., “Oligonucleotide Duplex Stability Controlled by the 7-Substituents of 7-Deazaguanine Bases”, <i>Bioorganic & Mechanical Chemistry Letters</i> , 5:3049-3052 (1995) (“Seela 1995”)
1032	<i>Exhibit number not used.</i>
1033	<i>Exhibit number not used.</i>
1034	2013-06-25 Declaration of Dr. George L. Trainor from IPR2012-00006
1035	Boss et al., “Cleavage of Allyl Ethers with Pd/C”, <i>Angew. Chem. Int. Ed. Engl.</i> , 15:558-559 (1976) (“Boss”)
1036	Qian et al., “Unexpected Enzymatic Fucosylation of the Hindered Tertiary Alcohol of 3-C-Methyl-N-Acetyllactosamine Produces a Novel Analogue of the LeX-Trisaccharide”, <i>Journal of the American Chemical Society</i> , 120:2184-2185 (1998) (“Qian”)
1037	Kamal et al., “A Mild and Rapid Regeneration of Alcohols from their Allylic Ethers by Chlorotrimethylsilane/Sodium Iodide”, <i>Tetrahedron Letters</i> , 40:371-372 (1999) (“Kamal”)
1038	Excerpts from Prosecution History of U.S. Patent No. 9,725,480 (“Ju”)
1039	Vollhardt et al., “Organic Chemistry”, Second Edition, W.H. Freeman and Co., New York (1994) (“Vollhardt”)

Exhibit No.	Description
1040	Yu et al., “Cyanine dye dUTP analogs for enzymatic labeling of DNA probes”, Nucleic Acids Research, 22:3226-3232 (1994) (“Yu”)
1041	Livak et al., “Detection of single base differences using biotinylated nucleotides with very long linker arms”, Nucleic Acids Research, 20:4831-4837 (1992) (“Livak”)
1042	Watson et al., “Genetical Implication of the Structure of Deoxyribonucleic Acid”, Nature, 171:964-967 (1953) (“Watson & Crick”)
1043	Zavgorodny et al., “1-Alkylthioalkylation of Nucleoside Hydroxyl Functions and its Synthetic Applications: A New Versatile Method in Nucleoside Chemistry”, Tetrahedron Letters, 32:7593-7596 (1991) (“Zavgorodny”)
1044	2015-02-11 Final Written Decision in IPR2013-00517
1045	2016-05-09 Federal Circuit Opinion Affirming IPR2013-00517
1046	Gigg et al., “The Allyl Ether as a Protecting Group in Carbohydrate Chemistry Part II”, J. Chem. Soc. (C), 1903-1911 (1968) (“Gigg”)
1047	2013-08-30 Substitute Columbia Patent Owner Response in IPR2012-00007, Paper 77
1048	2014-07-25 Final Written Decision in IPR2013-00128, Paper 92
1049	2014-10-28 Final Written Decision in IPR2013-00266, Paper 73
1050	2016-01-29 Federal Circuit Opinion Affirming IPR2013-00128 and IPR2013-00266
1051	Greenberg et al., “Optimization and Mechanistic Analysis of Oligonucleotide Cleavage from Palladium-Labile Solid-Phase Synthesis Supports”, J. Org. Chem., 63:4062-4068 (1998) (“Greenberg”)

Exhibit No.	Description
1052	Seitz et al., HYCRON, an Allylic Anchor for High-Efficiency Solid Phase Synthesis of Protected Peptides and Glycopeptides”, J. Org. Chem., 62:813-826 (1997) (“Seitz”)
1053	Gullier et al., “Linkers and Cleavage Strategies in Solid-Phase Organic Synthesis and Combinatorial Chemistry”, Chem. Rev., 100:2091-2157 (2000) (“Gullier”)
1054	U.S. Patent No. 8,088,575 (“Ju”)
1055	Stryer, “Biochemistry”, Fourth Edition, W.H. Freeman and Co., New York (1995) (“Stryer”)
1056	<i>Exhibit number not used.</i>
1057	<i>Curriculum Vitae</i> of Floyd Romesberg, Ph.D.
1058	List of documents considered by Floyd Romesberg, Ph.D.
1059	Sears et al., “CircumVent Thermal Cycle Sequencing and Alternative Manual and Automated DNA Sequencing Protocols Using the Highly Thermostable VentR (exo) DNA Polymerase”, BioTechniques, 13:626-633 (1992) (“Sears”)
1060	Columbia’s complaint for U.S. 9,708,358
1061	<i>Exhibit number not used.</i>
1062	<i>Exhibit number not used.</i>
1063	<i>Exhibit number not used.</i>
1064	<i>Exhibit number not used.</i>
1065	Excerpts from Prosecution History of U.S. Patent No. 9,708,358
1066	Declaration of Jingyue Ju from Prosecution History of U.S. Patent No. 9,708,358
1067	Declaration of Floyd Romesberg, Ph.D. for ’358

Exhibit No.	Description
<i>Exhibit numbers 1068-1079 not used.</i>	
1080	WO 98/53300 (“Pallas”)
<i>Exhibit numbers 1081-1086 not used.</i>	
1087	Declaration of William R. Zimmerman in support of motion to appear <i>pro hac vice</i> for Illumina, Inc.
1088	Declaration of Edward R. Reines in support of motion to appear <i>pro hac vice</i> for Illumina, Inc.
1089	In Re Edward R. Reines 14-MA004 (14-4) (Fed. Cir. 2014)
1090	Personal Statement of Edward R. Reines
1091	U.S. 6,111,116 to Benson and Menchen et al.
1092	U.S. 6,248,884 to Lam and Menchen et al.
1093	Ruparel and Ju et al., Proc. Natl. Acad. Sci. USA, 102:5932-5937 (2005) (“Ruparel”)
1094	Genet et al., Tetrahedron, 50:497-503 (1994) (“Genet 1994”)
1095	2018-04-20 IPR2017-02174, Paper 20, Decision Denying Institution of Inter Partes Review
1096	2018-04-20 IPR2017-02172, Paper 20, Decision Denying Institution of Inter Partes Review
1097	Nucleic Acids Research publication information for Metzker et al., “Termination of DNA synthesis by novel 3’-modified-deoxyribonucleoside 5’-triphosphates,” 22:4259-67 (1994).
1098	Sept. 4-5, 2013 Deposition Transcript of Dr. George L. Trainor in IPR2012-00007

Exhibit No.	Description
1099	IUPAC, Nomenclature of Organic Chemistry, Eds. Rigaudy et al., International Union of Pure and Applied Chemistry, Organic Chemistry Division, Commission on Nomenclature of Organic Chemistry, Pergamon Press, 1979.
1100	Jensen, "Organizations for Standardization of Quantities and Units," Metrologia 31:503-509 (1994/1995).
1101	Greene and Wuts, "Protective Groups in Organic Synthesis," third edition, John Wiley & Sons (1999)
1102	CRC Handbook of Chemistry and Physics, eds. Weast et al., 72nd edition, CRC Press (1991)
1103	McGraw-Hill Dictionary of Chemistry, ed. Parker, McGraw-Hill Book Co., 1984
1104	Solomons, "Organic Chemistry", Fourth Edition, John Wiley & Sons (1988) ("Solomons")
1105	Morrison et al., "Organic Chemistry," Third Edition, Allyn and Bacon, Inc. (1973)
1106	U.S. 5,808,045 to Hiatt et al. ("Hiatt")
1107	U.S. 6,627,436 to Sorge et al. ("Sorge")
1108	Cyclist [®] Exo-Pfu DNA Sequencing Kit, Instruction Manual, Stratagene (1998)
1109	Hedden et al., "DNA Sequence Determination Using Exonuclease-Deficient Pfu DNA Polymerase in a Cycle Sequencing Format," 207th ACS National Meeting, Abstract 121, American Chemical Society, San Diego, CA, March 13-17, 1994
1110	<i>Exhibit number not used.</i>
1111	<i>Exhibit number not used.</i>

Exhibit No.	Description
1112	Transcript for the Deposition of Steven M. Menchen, January 14, 2019 in IPR2018-00291, -00318, -00322, -00385 and -00797
1113	Transcript for the Deposition of Steven M. Menchen, January 15, 2019 in IPR2018-00291, -00318, -00322, -00385 and -00797
1114	Lemaire-Audoire and Genet et al., Tetrahedron Letters, 35:8783-8786 (1994)
1115	Lemaire-Audoire and Genet et al., Journal of Molecular Catalysis A: Chemical, 116:247-258 (1997)
1116	Qinglin Meng thesis from Dr. Ju's laboratory at Columbia University (2006)
1117	<i>Exhibit number not used.</i>
1118	Kutateladze, FEBS, 207:205-212 (1986)
1119	Reply Declaration of Floyd Romesberg, Ph.D.
1120	"The Race for the \$1000 Genome," Science, 311:1544-46 (2006)
1121	<i>Exhibit number not used.</i>
1122	Gardner et al., Nucleic Acids Research, 27:2545-53 (1999)
1123	<i>Exhibit number not used.</i>
1124	WO 04/018493 Solexa
1125	WO 04/018497 Solexa
1126	Kraevskii et al., Molecular Biology 21:25-29 (1987)
1127	IPR2012-00007, Paper 82, Opposition to Motion to Amend
1128	IPR2012-00007, Paper 83, Reply to Patent Owner Response
1129	Ju et. al., PNAS USA, 103:19635-40 (2006) ("Ju 2006")

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1130	U.S. 5,614,365 to Tabor et al.
1131	U.S. 5,885,813 to Davis et al.
1132	<i>Exhibit number not used.</i>
1133	Southworth et al., PNAS USA, 93:5281-85 (1996)
1134	Takahashi et al., Bulletin of the Chemical Society of Japan, 45:230-36 (1972)
1135	Yamamoto et al., Organometallics, 5:1559-67 (1986)
1136	Fields, Methods in Molecular Biology, Volume 35, Peptide Synthesis Protocols, Chapter 2, Humana Press 1994
1137	IPR2012-00007, Paper 79 Substitute Columbia Motion to Amend
1138	List of documents considered by Dr. Romesberg
1139	Illumina demonstratives for oral argument for IPR2018-00291, -00318, -00322, -00385, and -00797 Exhibit 1139 was originally served on February 22, 2019.

Respectfully submitted,

Dated: February 26, 2019

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **ILLUMINA UPDATED EXHIBIT LIST** is being served on February 26, 2019, via e-mail to counsel for the Trustees of Columbia University, at the email addresses below.
Exhibit 1139 was originally served on February 22, 2019.

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