IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

THE TRUSTEES OF COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK and QIAGEN SCIENCES, LLC,	)	
Plaintiffs,	)	Civil Action No. _____
v.	)	**JURY TRIAL DEMANDED**
ILLUMINA, INC.	)	
Defendant.	)	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiffs The Trustees of Columbia University in the City of New York ("Columbia University") and QIAGEN Sciences, LLC ("QIAGEN") (collectively "Plaintiffs"), by and through their undersigned counsel, for their Complaint against Defendant Illumina, Inc. ("Illumina"), allege as follows:

THE PARTIES

1. Plaintiff Columbia University is one of the world's leading institutions of higher education, located at 535 West 116th Street, New York, New York 10027. It is a non-profit educational corporation formed by special act of the Legislature of the State of New York.

2. Plaintiff QIAGEN Sciences, LLC is a Delaware company having its principal place of business at 19300 Germantown Road, Germantown, M[redacted] LLC is the successor-in-interest to QIAGEN Waltham, Inc. as December 31, 2017.

Columbia Ex. 2027
Illumina, Inc. v. The Trustees of Columbia University in the City of New York
IPR2020-01177

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2. Plaintiff QIAGEN Sciences, LLC is a Delaware company having its principal place of business at 19300 Germantown Road, Germantown, MD 20874. QIAGEN Sciences, LLC is the successor-in-interest to QIAGEN Waltham, Inc. as a result of a merger effective December 31, 2017.

3. Upon information and belief, Defendant Illumina, Inc. is a Delaware corporation having its principal place of business at 5200 Illumina Way, San Diego, California 92122.

JURISDICTION AND VENUE

4. This action arises under the Patent Laws of the United States of America, 35 U.S.C. § 1 *et seq*.

5. This Court has subject matter jurisdiction over this action under 28 U.S.C. § 1331 and 28 U.S.C. § 1338(a) because this is a civil action arising under the Patent Act.

6. This Court has personal jurisdiction over Illumina because Illumina is incorporated in the State of Delaware.

7. Venue is proper in this District under 28 U.S.C. § 1400(b) because Illumina is incorporated in the State of Delaware and thus resides in this District.

BACKGROUND

The Patents-in-Suit

8. On September 10, 2019, the United States Patent and Trademark Office ("USPTO") duly issued United States Patent No. 10,407,458 ("the '458 Patent"), entitled "Massive Parallel Method for Decoding DNA and RNA," in the names of inventors Jingyue Ju, Zengmin Li, John Robert Edwards, and Yasuhiro Itagaki.

9. On September 10, 2019, the USPTO duly issued United States Patent No. 10,407,459 ("the '459 Patent"), entitled "Massive Parallel Method for Decoding DNA and RNA," in the names of inventors Jingyue Ju, Zengmin Li, John Robert Edwards, and Yasuhiro Itagaki.

10. Columbia University owns by assignment all right, title, and interest in and to the '458 Patent and the '459 Patent (collectively "the Patents-in-Suit").

11. QIAGEN is the exclusive licensee of the Patents-in-Suit.

12. On January 31, 2019, the application that issued as the '458 Patent published as US2019/0031704. A true and correct copy of US2019/0031704 is attached hereto as Exhibit 1.

13. On March 21, 2019, the application that issued as the '459 Patent published as US2019/0085014 (collectively with US2019/0031704, "the Published Applications"). A true and correct copy of US2019/0085014 is attached hereto as Exhibit 2.

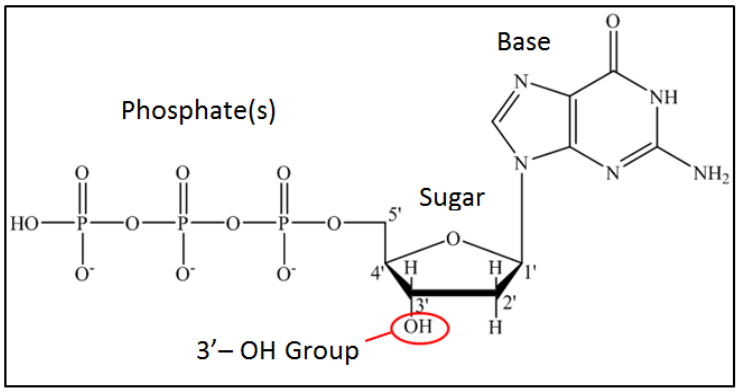
14. The inventions as claimed in the Patents-in-Suit are identical to the inventions as claimed in the Published Applications.

15. Illumina is a large and sophisticated company that has been a party to patent litigation with Columbia University and QIAGEN, and thus, on information and belief, Illumina monitors patent applications involving DNA sequencing technology and was aware of the content of each of the claims of the '458 Patent on or after they were published on January 31, 2019, and the content of each of the claims of the '459 Patent on or after they were published on March 21, 2019.

Nucleotides and DNA Sequencing

16. The Patents-in-Suit relate to modified versions of nucleotides (known as "nucleotide analogues") and methods of using such nucleotide analogues for sequencing DNA (deoxyribonucleic acid). DNA encodes the genetic information of living organisms. DNA consists of smaller building blocks called nucleotides; the sequence of the nucleotides determines hereditary traits in living organisms. DNA sequencing—*i.e.*, determining the order of the nucleotides in a DNA strand—is of enormous importance for a wide variety of applications in medicine, biotechnology, and other fields. For example, by sequencing the DNA of individuals with a particular disease or the DNA in tumor cells, medical researchers and physicians may learn the genetic basis for the disease or tumor and may design or provide therapies specifically targeted to it.

17. A nucleotide consists of a sugar, a base, and one or more phosphate groups, as shown below. Nucleotides are identified by their bases, which form the genetic code of DNA. There are four different nucleotide bases—an adenine ("A"), a guanine ("G"), a cytosine ("C"), and a thymine ("T"). A and G are known as "purine" bases, while C and T are "pyrimidine" bases. The sugar in the nucleotide contains five carbon atoms, conventionally numbered 1′ through 5′. When the nucleotide is found in isolation, a hydroxyl group (OH) is attached at the 3′ position and is referred to as the 3′-OH group (circled below). The nucleotide depicted below is called a deoxyribonucleotide triphosphate.



18. DNA consists of a chain of nucleotides, held together by bonds between a phosphate group of one nucleotide and a 3′-OH group of another nucleotide. In nature, two such chains of nucleotides form a double helix structure (forming a DNA double helix). Bonds between complementary base pairs hold the chains together, and base pairs always bond in the same way: A always pairs with T; C always pairs with G. These bonds between complementary base pairs form the "cross-bars" in the DNA double helix while the bonds between the phosphate group of one nucleotide and the 3′-OH group of the adjacent nucleotide form the "backbone" of the DNA double helix.

19. To duplicate, or "synthesize," DNA, the two strands of the DNA double helix are

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