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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THERMO FISHER SCIENTIFIC, INC.,
Petitioner,

v.

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA,
Patent Owner.

Case IPR2018-01370
Patent 8,110,673 B2

Before ERICA A. FRANKLIN, MICHELLE N. ANKENBRAND, and JOHN E. SCHNEIDER, *Administrative Patent Judges*.

ANKENBRAND, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314(a)

I. INTRODUCTION

Thermo Fisher Scientific, Inc. ("Petitioner") filed a Petition requesting an *inter partes* review of claims 1–3, 6–12, 14–17, and 19 of U.S. Patent No. 8,110,673 B2 (Ex. 1001, "the '673 patent"). Paper 1 ("Pet."). The Regents of the University of California ("Patent Owner") filed a Preliminary Response to the Petition. Paper 8 ("Prelim. Resp.").

We have authority under 35 U.S.C. § 314 to determine whether to institute an *inter partes* review. Upon considering the Petition and the Preliminary Response, along with the circumstances involved in this case, we determine that Petitioner does not show a reasonable likelihood that it would prevail in showing the unpatentability of at least one challenged claim. Accordingly, we deny the Petition and decline to institute an *inter partes* review.

II. BACKGROUND

A. Related Matters

Petitioner and Patent Owner identify an ongoing district court proceeding involving the '673 patent: *The Regents of the University of California et al. v. Affymetrix, Inc. et al.*, No. 3:17-cv-01394 (CASD). Pet. 69; Paper 4, 2. The parties also note that Petitioner concurrently filed a separate petition involving the '673 patent (IPR2018-01370) and, shortly before, filed two petitions involving a related patent, U.S. Patent No. 8,835,113 B2 (IPR2018-01367 and IPR2018-01368). Pet. 69–70; Paper 4, 1–2.

B. The '673 Patent

The '673 patent, titled "Aggregation Sensor and Solutions and Kits Comprising the Same," issued on February 7, 2012. Ex. 1001, [45], [54].

The '673 patent relates to an aggregation sensor for detecting and analyzing aggregants in a sample. *Id.* at 1:26–27. According to the specification, "[t]here is a continuing need in the art for methods of detecting and analyzing particular biomolecules [i.e., aggregants] in a sample, and for compositions and articles of manufacture useful in such methods." *Id.* at 1:56–59. An aggregant or biomolecule to be assayed may include, for example, a polysaccharide, a polynucleotide, a peptide, or a protein. *Id.* at 15:56–58. "The aggregation sensor comprises a component that can bind to an aggregant or class of aggregants." *Id.* at 10:10–12.

The specification further explains that "[c]onjugated polymers have proven useful as light gathering molecules in a variety of settings." *Id.* at 1:49–50. In particular, "[w]ater-soluble conjugated polymers such as cationic conjugated polymers (CCPs) have been used in bioassays to improve detection sensitivity and provide new routes of selectivity in analyzing biomolecules." *Id.* at 1:51–55. The molecular structure of those molecules are of interest in DNA and RNA detection methods because it "allows for a collective response and, therefore, optical amplification of fluorescent signals." *Id.* at 2:32–37. Specifically, "[t]he large number of optically active units along the polymer chain increases the probability of light absorption, relative to small molecule counterparts." *Id.* at 2:37–39. The presence of target DNA in a sample may be detected upon delivery of excitations to fluorophores, using facile fluorescence resonance energy transfer (FRET). *Id.* at 2:39–42.

The specification explains that "[r]ecent studies indicate that energy transfer between segments in conjugated polymers may be substantially more important than along the backbone" and that external perturbations that

decrease the elongation of the backbone, or that bring its segments closer together, may be used to modify emissive properties of the polymer in solution. *Id.* at 2:43–49. Based on that information, the specification states that the inventors recognized "a small number of fluorescent units within a polymer sequence could be activated by structural changes that compressed or aggregated the polymer chains to ultimately change the emission color," and then designed a cationic conjugated polymer structure in accordance with that principle. *Id.* at 2:50–55. According to the specification, "[e]lectrostatic complexation with negatively charged DNA can be used to reduce the average intersegment distance. When combined with a fluorophore labeled peptide nucleic acid (PNA) strand, the polymer can be used to design a three color DNA detection assay." *Id.* at 2:55–60.

C. Illustrative Claim

Of the challenged claims, claim 1 is independent and illustrative of the claimed subject matter. Claim 1 recites:

> 1. An aggregation sensor soluble in a polar medium comprising:
>
> (a) a conjugated polymer comprising
>
> a plurality of first optically active units forming a conjugated system, having a first absorption wavelength at which the first optically active units absorbs light to form an excited state, and
>
> a plurality of solubilizing functionalities; and
>
> (b) one or more second optically active units that can receive energy from the excited state of the first optically active unit;
>
> said aggregation sensor comprising at least three first optically active units per second optically active unit;

wherein the second optically active unit is grafted to the conjugated polymer.

Ex. 1001, 37:45–60.

D. The Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1–3, 6–12, 14–17, and 19 of the '673 patent based on the following grounds:

References	**Statutory Basis**	**Claims Challenged**
Yang[1] and Wang[2]	§ 103(a)	1, 3, 15, 16, 19
Yang, Wang, and the Handbook[3]	§ 103(a)	2, 6
Yang, Wang, and Inganas[4]	§ 103(a)	7–12, 14

See Pet. 18. Petitioner relies on the Declaration of Kirk S. Schanze, Ph.D. (Ex. 1002)[5] to support its asserted grounds of unpatentability. Patent Owner disputes that Petitioner's asserted grounds render any of the challenged claims unpatentable. *See generally* Prelim. Resp. Patent Owner relies on the Declaration of Dwight Seferos, Ph.D. (Ex. 2008).

[1] Yang et al., *High-Efficiency Saturated Red-Emitting Polymers Derived from Fluorene and Naphthoselenadiazole*, 37 MACROMOLECULES 1211–1218 (2004) ("Yang") (Ex. 1003).
[2] Wang et al., *Size-Specific Interactions Between Single-and Double-Stranded Oligonucleotides and Cationic Water-Soluble Oligofluorenes*, 13 ADV. FUNCT. MATER. 463–467 (2003) ("Wang") (Ex. 1004).
[3] Haugland, HANDBOOK OF FLUORESCENT PROBES AND RESEARCH PRODUCTS, 9th ed., Molecular Probes (2002) ("the Handbook") (Ex. 1005).
[4] Inganas et al., WO 2003/096016 A1, published Nov. 20, 2003 ("Inganas") (Ex. 1006).
[5] Petitioner includes the letters "TFS" with its exhibit numbers. We do not adopt that practice in this decision.

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