

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THERMO FISHER SCIENTIFIC INC.
Petitioners

v.

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
Patent Owner.

Case IPR2018-01156
U.S. Patent No. RE46,817

Declaration of Kirk S. Schanze, Ph.D.

<p>UC Ex-2003 Thermo Fisher v. UC Regents IPR2018-01347</p>
--

*Inter Partes Review of U.S. Patent No. RE46,817
Declaration of Kirk S. Schanze, Ph.D. (TFS1002)*

TABLE OF CONTENTS

I.	Overview.....	4
II.	My background and qualifications	4
III.	Basis for my opinion.....	6
IV.	Person of ordinary skill in the art	10
V.	State of the art before August 26, 2002	11
A.	Overview of Förster resonance energy transfer (FRET).....	11
B.	Chromophores used in FRET	14
1.	Fluorescent Dyes used as FRET acceptors.....	14
2.	Quenchers used as FRET acceptors	15
3.	Conjugated polymers as donors in FRET systems.....	17
C.	Nucleic acid hybridization using FRET was well known by August 2002 ..	27
D.	Signal amplification in FRET sensing systems	32
VI.	The '817 patent and its claims	38
A.	Independent claim 1.....	46
B.	Dependent claim 3	47
VII.	Meaning of Claim Terms.....	47
A.	Multichromophore system:.....	47
B.	Other claim terms:	48
VIII.	The basis of my analysis with respect to obviousness	48
IX.	The Challenged Claims would have been obvious over Cardullo, McQuade and LeClerc.....	49

*Inter Partes Review of U.S. Patent No. RE46,817
Declaration of Kirk S. Schanze, Ph.D. (TFS1002)*

A.	Claim 1	50
1.	A POSA would have had a reason to combine Cardullo, McQuade, and LeClerc.....	69
2.	A POSA would have had a reasonable expectation of success at arriving at the claimed multichromophore system.....	77
B.	Dependent claim 3	86
X.	The Challenged Claims would have been obvious over Cardullo, LeClerc and Harrison.....	87
A.	Claim 1	88
1.	A POSA would have had a reason to combine Cardullo, LeClerc and Harrison	98
2.	A POSA would have had a reasonable expectation of success at arriving at the claimed multichromophore system.....	108
B.	Dependent claim 3	112
XI.	I am not aware of any objective indicia of nonobviousness that would change my opinion regarding the obviousness of the challenged claims ...	114

***Inter Partes Review of U.S. Patent No. RE46,817
Declaration of Kirk S. Schanze, Ph.D. (TFS1002)***

I, Kirk S. Schanze, Ph.D., do hereby declare as follows:

I. Overview

1. I am over the age of 18 and otherwise competent to make this declaration. I have been retained as an expert on behalf of Thermo Fisher Scientific Inc. ("Thermo Fisher"). I understand this declaration is being submitted together with a petition for *Inter Partes* Review ("IPR") of claims 1 and 3 ("the challenged claims") of U.S. Patent No. RE46,817 ("the '817 patent") (TFS1001).

2. I am being compensated for my time in connection with this IPR at my standard legal consultant rate of \$375/hr. I have no personal or financial interest in Thermo Fisher or in the outcome of this proceeding.

3. In preparing this declaration, I have reviewed the '817 patent (TFS1001) and considered each of the documents cited therein, in light of the general knowledge in the art before August 26, 2002. I have also relied upon my experience in the relevant art and considered the viewpoint of a person of ordinary skill in the art ("POSA"; defined in § IV) before August 26, 2002.

II. My background and qualifications

4. I am currently the Robert A. Welch Distinguished University Chair in the Chemistry Department at the University of Texas, San Antonio. A copy of my CV is attached as Exhibit TFS1027.

*Inter Partes Review of U.S. Patent No. RE46,817
Declaration of Kirk S. Schanze, Ph.D. (TFS1002)*

5. I earned my B.S. in Chemistry from Florida State University in 1979 and my Ph.D. in Organic Chemistry from the University of North Carolina, Chapel Hill, in 1983. I was a Postdoctoral Research Associate in the Department of Chemistry at the University of North Carolina, Chapel Hill from 1983-1984. I was then a Miller Postdoctoral Fellow in the Chemistry Department of the University of California, Berkeley from 1984-1986.

6. In 1986 I was appointed an Assistant Professor in the Department of Chemistry of the University of Florida. I became an Associate Professor at Florida in 1992 and was appointed full Professor in 1997. From 1997 to 2016 I held various Professorship chairs as outlined in my CV. In 2016 I moved to my current position at the University of Texas, San Antonio, where I serve as the Welch Distinguished Professor.

7. Throughout my career I have earned various honors and awards, including the Globalization Award from American Chemical Society (ACS) in 2018. I was made a Fellow of the ACS in 2011, and won the Florida Award from the Florida Section of ACS in 2009. I have also been awarded many Visiting Professor and Lecturer appointments at various universities throughout Asia. A full list of my Honors and Awards is provided in my CV.

8. I have also held many professional service positions, such as the Chair of the Editor Search Committee for the ACS in 2014 and 2015 and I was the Chair

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.