

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CYTEK BIOSCIENCES, INC.,
Petitioner

v.

BECKMAN COULTER, INC.
Patent Owner

Case No. PGR2025-00088
U.S. Patent No. 12,174,107 B1
Issue Date: December 24, 2024

Title: FLOW CYTOMETER

PETITIONER UPDATED EXHIBIT LIST

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Exhibit No.	Description of Document
1001	U.S. Patent No. 12,174,107 B2 to Yong Qin Chen (filed September 3, 2024, issued December 24, 2024) (“ 107 patent ”)
1002	Declaration of Fedor A. Ilkov, Ph.D.
1003	Prosecution History of U.S. Patent No. 12,174,107 B2
1004	Nigel P. Carter and Michael G. Ormerod, <i>Chapter 1, Introduction to the Principles of flow cytometry</i> , Flow Cytometry, pp. 1-22 (3rd ed. 2000)
1005	U.S. Patent No. 6,683,314 B2 to Clifford A. Oostman, Jr. et al. (filed August 28, 2001; published January 27, 2004) (“ Oostman ”)
1006	U.S. Patent No. 5,317,162 to Bertram G. Pinsky et al. (filed September 9, 1992; published May 31, 1994) (“ Pinsky ”)
1007	Excerpts of Howard M. Shapiro, Practical Flow Cytometry (4th ed. 2003) (“ Shapiro ”)
1008	World Patent No. WO 2010/101623 A1 to Michael Thomas (filed March 2, 2010; published September 10, 2010) (“ Thomas ”)
1009	U.S. Patent No. 8,284,402 B2 to Erich Frazier et al. (filed February 26, 2010; published October 9, 2012) (“ Frazier ”)
1010	U.S. Patent No. 4,244,045 to Kiyoshi Nosu et al. (filed January 31, 1979; published January 6, 1981) (“ Nosu ”)
1011	U.S. Patent No. 8,537,468 B1 to Xuan Wang et al. (filed June 10, 2011; published September 17, 2013) (“ Wang ”)
1012	U.S. Patent No. 6,198,864 B1 to Brian E. Lemoff et al. (filed November 24, 1998; published March 6, 2001) (“ Lemoff ”)

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1013	U.S. Patent No. 7,212,343 B1 to Chun He et al. (filed July 11, 2003; published May 1, 2007) (“ He ”)
1014	U.S. Patent No. 5,835,517 to Vijaysekhar Jayaraman et al. (filed October 4, 1996; published November 10, 1998) (“ Jayaraman ”)
1015	U.S. Patent No. 6,201,908 B1 to Eric B. Grann (filed July 2, 1999; published March 13, 2001) (“ Grann ”)
1016	U.S. Patent No. 6,542,306 B2 to Timothy D. Goodman (filed March 16, 2001; published April 1, 2003) (“ Goodman ”)
1017	Listing of Challenged Claims
1018	Joint Claim Construction Chart including Exhibit A Parties Agreed and Proposed Constructions filed in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 24-945 (D. Del. May 28, 2025), D.I. 89 & 89-1
1019	Plaintiff’s Disclosure of Asserted Claims and Infringement Contentions [Redacted Version], served in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 24-945 (D. Del. Feb. 14, 2025)
1020	Definition of Mirror from Concise Oxford English Dictionary (12th ed. 2011)
1021	Excerpts of Course 1 Fundamentals of Light and Lasers, Optics and Photonics Series, Modules 1-6, OP-TEC (3rd ed. 2018)
1022	Henry Semat and Robert Katz, <i>Chapter 38: Mirrors and Lenses</i> , Physics, Robert Katz Publications, pp. 699-722 (1958)
1023	Steve Wasserman, <i>Geometrical optics and ray tracing</i> , Course Wiki (August 27, 2019)

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1024	<i>Reserved</i>
1025	Complaint filed in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 1:24-cv-00945 (D. Del. Aug. 14, 2024), D.I. 1
1026	Summons in a Civil Action to Cytek Biosciences, Inc. c/o Cogency Global, Inc. served on August 15, 2024, filed in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 1:24-cv-00945 (D. Del. Aug. 16, 2024), D.I. 5
1027	Stipulation and Order Amending Scheduling Order filed in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 1:24-cv-00945 (D. Del. March 4, 2025), D.I. 55
1028	<i>Reserved</i>
1029	Excerpts of the Prosecution history of U.S. Patent No. 9,746,412
1030	Rochelle A. Diamond, <i>Chapter 8: Quality Control Guidelines for Research Flow Cytometry</i> , In Living Color, pp. 98-105 (2000)
1031	R.M.P. Doornbos et al., <i>White Blood Cell Differentiation Using a Solid State Flow Cytometer</i> , Cytometry 14:589-594 (1993) (“ Doornbos ”)
1032	SensL SPMMini High Gain APD (Oct. 2007)
1033	Menlo Systems APD210/310 High Sensitivity Detector Unit (Apr. 2021)
1034	Thorlabs.com – High-Sensitivity Avalanche Photodetectors website Overview, Specs and Documents & Drawings, (Aug. 31, 2011), https://web.archive.org/web/20110831115024/http://www.thorlabs.com/NewGroupPage9.cfm?ObjectGroup_ID=947

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1035	World Patent No. WO 94/29695 to Oddbjørn Gjelsnes (filed June 8, 1993; published December 22, 1994) (“ Gjelsnes ”)
1036	Carleton C. Stewart et al., <i>Flow Cytometer in the Infrared: Inexpensive Modifications to a Commercial Instrument</i> , Cytometry Part A, 67A:104-111 (2005) (“ Stewart ”)
1037	William G. Lawrence et al., <i>A 16-channel avalanche photodiode detector array for visible and near-infrared flow cytometry</i> , Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues IV, Proc. of SPIE, Vol. 6088, 60880T, (2006) (“ Lawrence ”)
1038	William G. Lawrence et al., <i>A Comparison of Avalanche Photodiode and Photomultiplier Tube Detectors for Flow Cytometry</i> , Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues VI, Proc. of SPIE Vol. 6859, 68590M, (2008) (“ Lawrence 2008 ”)
1039	Shutao Zhao et al., <i>High gain avalanche photodiode (APD) arrays in flow cytometer optical [sic] system</i> , IEEE (2011) (“ Zhao ”)
1040	U.S. Patent No. 8,188,438 B2 to Dongqing Li (filed Mar. 8, 2010; published May 29, 2012) (“ Li-438 ”)
1041	Canadian Patent No. 2 771 324 to Paul Patt (filed Aug. 20, 2010; published June 21, 2016) (“ Patt-324 ”)
1042	U.S. Patent No. 7,580,120 B2 to Yuichi Hamada et al. (filed Apr. 6, 2006; published Aug. 25, 2009) (“ Hamada ”)
1043	World Patent No. 98/59233 to Van S. Chandler (filed June 22, 1998; published Dec. 30, 1998) (“ Chandler-233 ”)
1044	U.S. Patent No. 7,523,637 B2 to Wayne D. Roth et al. (filed Nov. 29, 2007; published Apr. 28, 2009) (“ Roth-637 ”)

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1045	U.S. Patent No. 7,505,131 B2 to Wayne D. Roth (filed Mar. 6, 2008; published Mar. 17, 2009) (“ Roth-131 ”)
1046	U.S. Patent Application Publication No. 2008/0305481 A1 to Douglas F. Whitman et al. (filed Dec. 13, 2007; published Dec. 11, 2008) (“ Whitman ”)
1047	U.S. Patent Application Publication No. 2007/0269345 A1 to Adam Richard Schilffarth et al. (filed May 17, 2007; published Nov. 22, 2007) (“ Schilffarth-345 ”)
1048	U.S. Patent Application Publication No. 2007/0207513 A1 to Keld Sorensen et al. (filed Mar. 5, 2007; published Sept. 6, 2007) (“ Sorensen ”)
1049	U.S. Patent Application Publication No. 2009/0071225 A1 to Adam Richard Schilffarth (filed Sept. 17, 2008; published Mar. 19, 2009) (“ Schilffarth-225 ”)
1050	U.S. Patent Application Publication No. 2009/0237658 A1 to Edward Calvin et al. (filed Apr. 9, 2009; published Sept. 24, 2009) (“ Calvin ”)
1051	U.S. Patent No. 6,139,800 to Van S. Chandler (filed June 22, 1998; published Oct. 31, 2000) (“ Chandler ”)
1052	Luminex 100™ IS User Manual Version 2.3 (Oct. 2005)
1053	Luminex FlexMap 3D® User Manual (Jan. 2019)
1054	BD Biosciences Immunocytometry Systems Technical Specifications BD FACSAarray (Oct. 2003)
1055	Archived website page for Hamamatsu NIR High Sensitivity Type products, (June 20, 2010),

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	https://web.archive.org/web/20100620045039/http://jp.hamamatsu.com/products/sensor-ssd/pd078/pd079/pd083/index_en.html
1056	Archived website page for Hamamatsu Short Wavelength Type products, (June 20, 2010), https://web.archive.org/web/20100620044720/http://jp.hamamatsu.com/products/sensor-ssd/pd078/pd079/pd082/index_en.html
1057	<i>Reserved</i>
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1059	<i>Reserved</i>
1060	Hamamatsu Si APD S5343 to S5345, S9073 to S9075, Short wavelength type APD (Apr. 2004)
1061	Hamamatsu Si APD S8890 series, Long wavelength type APD (June 2010)
1062	Hamamatsu Si APD S2381 to S2385, S5139, S8611, S3884, S4315 series, Low bias operation, for 800 nm band (May 2010)
1063	Hamamatsu Products by Division, (Aug. 7, 2011), https://web.archive.org/web/20110807025645/http://sales.hamamatsu.com:80/en/products.php
1064	First Sensor APD Data Sheet Part Description AD800-11 to Order # 500970, Version 20-06-11 (June 2011)
1065	Thorlabs, Collimated Light's Non-Zero Beam Divergence, <i>Does collimated light maintain a constant beam diameter out to infinity?</i> (Apr. 20, 2021), https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=14489

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1066	Edmund Optics, Considerations in Collimation, https://www.edmundoptics.com/knowledge-center/application-notes/optics/considerations-in-collimation/
1067	<i>Reserved</i>
1068	Affidavit of Mina Ching
1069	<i>Reserved</i>
1070	U.S. Patent No. 9,746,412 B2 to Yong Qin Chen (filed Nov. 26, 2014; published Aug. 29, 2017) (“ 412 ”)
1071	Prosecution History of PCT/US2013/043453 (the “ PCT App. ”)
1072	<i>Reserved</i>
1073	<i>Reserved</i>
1074	<i>Reserved</i>
1075	<i>Reserved</i>
1076	Prosecution history of EP24151670
1077	<i>Reserved</i>
1078	U.S. Patent No. 11,255,772 B2 to Yong Qin Chen (filed June 30, 2017; published Feb. 22, 2022) (“ 772 ”)
1079	<i>Reserved</i>
1080	<i>Reserved</i>
1081	Declaration of Dr. David Schaafsma, Ph.D. in Support of Beckman Coulter’s Opening Claim Construction Brief, dated June 5, 2025, filed

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	in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 1:24-cv-00945 (D. Del. July 27, 2025)
1082	<i>Reserved</i>
1083	<i>Reserved</i>
1084	<i>Reserved</i>
1085	How Gas-Ion Lasers Work, Lexel Laser (May 14, 2004), https://web.archive.org/web/20040817080937/http://www.lexellaser.com/techinfo_gas-ion.htm
1086	Clive Barnes, Copper at the Cutting Edge: The Copper Vapor Laser (June 2001), https://web.archive.org/web/20090101015131/https://copper.org/publications/newsletters/innovations/2001/06/cutting_edge.html
1087	Argon Lasers, Remanufactured Air-Cooled Argon and Argon/Krypton Lasers, Midwest Laser Products LLC (Dec. 2, 2015) https://web.archive.org/web/20151202062833/https://www.midwest-laser.com/Products/argon-lasers.html
1088	U.S. Patent No. 12,174,106 B2 to Yong Qin Chen (filed December 22, 2021, issued December 24, 2024) (“ 106 patent ”)
1089	Excerpts from Newport Catalog, including Focusing and Collimating pp. 479-481 and Optics Glossary pp. 500-505 available at http://rpdata.caltech.edu/courses/aph162/2007/Protocols/Optics/e3613_Focusing-and-Collimating.pdf and http://rpdata.caltech.edu/courses/aph162/2007/Protocols/Optics/e3878_Optics-Glossary.pdf
1090	Newport Catalog, <i>Precision Laser & Optics Products</i> , available at http://rpdata.caltech.edu/courses/aph162/2007/Protocols/Optics/Newport%20Catalog.pdf

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1091	U.S. Patent No. 10,330,582 B2 to Yong Qin Chen (filed June 30, 2017, issued June 25, 2019) (“ 582 patent ”)
1092	Jean-Luc Néron, Application Note Fiber Coupling Efficiency Calculation, Doric Lenses Inc., (December 5, 2005), https://www-eng.lbl.gov/~shuman/NEXT/CURRENT_DESIGN/TP/FO/fiber_coupling_efficiency_doric_lenses.pdf
1093	Thorlabs, Single Mode Fiber, https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=949
1094	Thorlabs, 0.22 NA Silica Core, Glass Clad Multimode Optical Fiber, Step Index, https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=6838
1095	Thorlabs, 0.39 NA TECS-Clad Multimode Optical Fiber, Step Index, https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=6845
1096	Beckman Coulter, Spectral Flow Cytometry: A Detailed Scientific Overview, https://www.beckman.com/resources/reading-material/application-notes/spectral-flow-cytometry-detailed-scientific-overview
1097	Thermo Fisher Scientific, Electronics of a Flow Cytometer, https://web.archive.org/web/20200919201221/https://www.thermofisher.com/us/en/home/life-science/cell-analysis/cell-analysis-learning-center/molecular-probes-school-of-fluorescence/flow-cytometry-basics/flow-cytometry-fundamentals/electronics-flow-cytometer.html
1098	Claudio Ortolani, <i>Chapter 22 Non-Conventional Flow Cytometry</i> , Flow Cytometry Today, pp. 497-522 (2023)
1099	Beckman Coulter Life Sciences Launches Industry-First Modular Spectral Flow Cytometry Solution (March 18, 2025), https://www.beckman.com/news/beckman-coulter-life-sciences-launches-industry-first-modular-spectral-flow-cytometry-solution
1100	Beckman Coulter, CytoFLEX mosaic Spectral Detection Module, https://www.beckman.com/flow-cytometry/research-flow-cytometers/cytoflex-mosaic
1101	U.S. Patent No. 7,280,204 B2 to Joseph Paul Robinson et al. (filed April 8, 2005, issued October 9, 2007) (“ Robinson ”)

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1102	Howard M. Shapiro and Michael Hercher, <i>Flow Cytometers Using Optical Waveguides in Place of Lenses for Specimen Illumination and Light Collection</i> , Cytometry, 7:221-223 (1986)
1103	Markman Hearing Transcript from <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 24-945 (D. Del. August 21, 2025)
1104	Newport, <i>Technical Note: Fiber Optic Coupling</i> , (2017), https://web.archive.org/web/20171018084228/https://www.newport.com/n/fiber-optic-coupling
1105	Markman Hearing Transcript from <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 24-945 (D. Del. September 17, 2025)
1106	First Amended Complaint filed in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 1:24-cv-00945 (D. Del. Jan. 9, 2025), D.I. 42
1107	U.S. Provisional Application 61/911,859 to Yong Qin Chen (filed December 4, 2013)
1108	Excerpts of the Prosecution history of U.S. Patent No. 9,746,412
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1112	Excerpts from the Opening Invalidity Expert Report of Fedor A. Ilkov, Ph.D. [Redacted Version], served in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 24-945 (D. Del. Dec. 19, 2025)
1113	Memorandum from Scott R. Boalick, Chief Administrative Patent Judge re Guidance on USPTO’s recission of “Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation,” dated March 24, 2025
1114	Teleconference Transcript from <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 24-945 (D. Del. March 24, 2025)
1115	Plaintiff Beckman Coulter, Inc.’s Letter to the Honorable Eleanor G. Tennyson Regarding Discovery Dispute [Public Version], filed in

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1116	Memorandum from John A Squires, Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office re Voluntary Search Disclosure Declarations as a Favorable Factor in Institution Decisions, dated November 17, 2025
1117	Excerpts of the Prosecution history of U.S. Patent No. 9,746,412
1118	Amended Joint Claim Construction Chart including Exhibit A Parties Agreed Constructions filed in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 24-945 (D. Del. Aug. 1, 2025), D.I. 131
1119	Order filed in <i>Beckman Coulter, Inc. v. Cytek Biosciences, Inc.</i> , C.A. No. 24-945 (D. Del. Feb. 24, 2026), D.I. 226

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CERTIFICATE OF SERVICE

I hereby certify, pursuant to 37 C.F.R. § 42.6 that I caused a true and correct copy of the foregoing **PETITIONER UPDATED EXHIBIT LIST** to be served via electronic mail on the 6th day of March, 2026, upon Patent Owner's counsel as follows:

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