

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FORESIGHT DIAGNOSTICS INC.,

Petitioner,

v.

PERSONALIS, INC.

Patent Owner.

Case IPR2023-00317
U.S. Patent No. 11,408,033

**PATENT OWNER'S SUR-REPLY TO PETITIONER'S REPLY TO
PATENT OWNER'S RESPONSE**

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2001	The Scientist Staff, “2022 Top 10 Innovations,” Dec. 12, 2022, available at https://www.the-scientist.com/features/2022-top-10-innovations-70792
2002	Raphael, B., et al., “Identifying driver mutations in sequenced cancer genomes: computational approaches to enable precision medicine,” Genome Medicine 2014, 6:5
2003	Supplementary Figures 1-3 for Wagle, N., et al., “High-Throughput Detection of Actionable Genomic Alterations in Clinical Tumor Samples by Targeted, Massively Parallel Sequencing,” Cancer Discovery (2012) available at https://aacrjournals.org/cancerdiscovery/article/2/1/82/2910/High-Throughput-Detection-of-Actionable-Genomic
2004	Excerpt from U.S. Patent Appl. No. 14/810,337 prosecution history
2005	Excerpt from U.S. Patent Appl. No. 15/996,215 prosecution history
2006	Foresight Diagnostics Patent Issued for Minimal Residual Disease Detection Technology, dated Sept. 27, 2022 available at https://foresight-dx.com/news/foresight-diagnostics-patentissued-for-minimal-residual-disease-detection-technology-1
2007	Swanton, C., “Plasma-Derived Tumor DNA Analysis at Whole-Genome Resolution,” Clinical Chemistry 59:1 6-8 (2013)
2008	Embodying Product Claim Chart for U.S. Patent No. 11,403,033

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2009	Transcript of the deposition of John Quackenbush, Ph.D., taken on January 31, 2018 in Guardant Health, Inc. v. Foundation Medicine, Inc., Case IPR2017-01170, IPR2017-01447, IPR2017-01448
2010	<i>Curriculum Vitae</i> of Dr. Henry Morrice Furneaux
2011	Exhibit number not used
2012	Exhibit number not used
2013	Exhibit number not used
2014	Exhibit number not used
2015	Exhibit number not used
2016	Quackenbush hand-written genome sequencing calculations from September 21, 2023 deposition
2017	Berglund et al., Next-generation sequencing technologies and applications for human genetic history and forensics, <i>Investigative Genetics</i> , 2:23 (2011)
2018	Transcript of the deposition of John Quackenbush, Ph.D., taken on September 21, 2023
2019	RESERVED

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2020	RESERVED
2021	RESERVED
2022	RESERVED
2023	RESERVED
2024	Excerpt from File History of U.S. Patent No. 11,384,394
2025	Excerpt from File History of U.S. Patent No. 11,408,033
2026	Excerpt from Sambrook, et al., Molecular Cloning, Vol. 1, 2001
2027	Gellert, et al., Helix Formation by Guanylic Acid, Proc. N. A. S., Vol. 48, 1962
2028	Gerry, et al., Universal DNA Microarray Method for Multiplex Detection of Low Abundance Point Mutations, J. Mol. Biol (1999) 292, 251-262
2029	Exhibit number not used
2030	Chen, et al., Personal Omics Profiling Reveals Dynamic Molecular and Medical Phenotypes, Cell 148, 1293-1307, March 16, 2012

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2031	Declaration of Henry Morrice Furneaux
2032	Declaration of John West
2033	Declaration of Jonathan MacQuitty
2034	Declaration of Doug Zeman
2035	Declaration of Dan Norton
2036	April 2, 2012 Email from John West to Christian Haudenschild re Personalis Laboratory plans
2037	May 3, 2012 Email from John West to Mark Pratt re Comparing methods to determine SNP error rate with attachment
2038	May 3, 2012 Google calendar reminder re Dev Group Weekly Mtg
2039	May 4, 2012 Google calendar reminder re Pipeline timeline walk through
2040	May 4, 2012 Google calendar reminder re Personalis Weekly Team Meeting
2041	May 8, 2012 Email from John West to Carol Tillis re J West Board slides with one slide revised (#8 of 14) with attachment

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2042	May 8, 2012 Email from Richard Chen to John West, et al. re Final Board Slides with attachment
2043	May 8, 2012 Minutes of a Meeting of the Board of Directors of Personalis, Inc.
2044	April 24, 2012 Email from Hugo Lam to John West, et al. re Personalis Servers (with new storages)
2045	Presentation, Update from Ashley Lab
2046	January 6, 2012 Email from John West to Mark Pratt, et al., re Draft Framework for Personalis accuracy-related product development with attachment
2047	May 11, 2012 Google Calendar reminder, Personalis Weekly Team Meeting
2048	Google Calendar reminder re Accuracy review / brainstorm on May 5, 2012
2049	May 25, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2050	May 25, 2012 Email from Carlos Bustamente to Mark Pratt re Founder meeting schedule change for this PM
2051	May 14, 2012 Email from Richard Chen to Founders, et al. re Founder Working Group Proposal with attachment
2052	May 15, 2012 Email from Mark Pratt to John West re accuracy strategy notes with attachment

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2053	May 15, 2012 Email from Scott Kirk to Richard Chen, et al., re Sprint 0 sprint backlog
2054	May 22, 2012 Email from John West to Richard Chen, et al., re Spreadsheet for 2pm discussion of Accuracy Differentiation with attachment
2055	May 22, 2012 Email from John West to Mark Pratt re My slides for meeting with Mike Snyder yesterday with attachments
2056	May 29, 2012 Email from John West to Scott Kirk re Accuracy documents to convert into project plan format with attachments
2057	June 1, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2058	June 15, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2059	June 22, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2060	June 29, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2061	June 7, 2012 Email from John West to Richard Chen re Accuracy next steps, spreadsheet to organize the discussion with attachment
2062	June 11, 2012 Email from Richard Chen to John West, et al. re updated board slides with attachment
2063	June 11, 2012 Email from John West to Richard Chen, et al. re Draft Board slides for your comments with attachment

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2064	June 12, 2012 Minutes of a Meeting of the Board of Directors of Personalis, Inc.
2065	June 17, 2012 Email from John West to Scott Kirk re Sprint 2 overview
2066	July 6, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2067	July 13, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2068	July 20, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2069	July 27, 2012 Google Calendar reminder re Personalis Weekly Team Meeting
2070	July 17, 2012 Email from Richard Chen to John West, et, al. re Final Board Slides with attachment
2071	July 18, 2012 Email from John West to Carol Tillis, et, al. re JW Board slides for printing with attachment
2072	July 18, 2012 Google calendar reminder re 2012 Personalis BOD Meeting
2073	July 18, 2012 Minutes of Meeting of The Board of Directors of Personalis, Inc
2074	July 24, 2012 Quick Notes on Lab Sequencing From Discussion with JW

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2075	August 6, 2012 Email from Mark Pratt to John West re Lab Projects with attachment
2076	August 6, 2012 Email from John West to Mark Pratt re Lab Projects
2077	August 10, 2012 Email from Richard Chen to John West re Sprint 4 pre planning =JW Questions & Input
2078	August 28, 2012 Email from Nan Leng to Hugo Lam re MiSeq 2x250 run completed over the weekend
2079	August 3, 2012 Google calendar reminder re Personalis Weekly Team Meeting
2080	August 10, 2012 Google calendar reminder re Personalis Weekly Team Meeting
2081	August 17, 2012 Google calendar reminder re Personalis Weekly Team Meeting
2082	August 20, 2012 Email from John West to Russ Altman re USE THIS ONE: my edits/slides v2 with attachment
2083	September 4, 2012 Email from Richard Chen to John West, et al. re Final Board Slides with attachment
2084	September 4, 2012 Email from John West to Carol Tillis re Personalis Board meeting preview
2085	September 5, 2012 Google calendar reminder re 2012 Personalis BOD Meeting

Exhibit No.	Description
2086	September 5, 2012 Email from John West to Carol Tillis and Eliane Sousa, et al. re John West's Board Slides with attachment
2087	September 5, 2012 Minutes of A Meeting of The Board of Directors of Personalis, Inc.
2088	September 7, 2012 Google calendar reminder re Personalis Monthly Team Meeting
2089	September 27, 2012 Purchase Order to Agilent
2090	October 5, 2012 Google Calendar reminder re Personalis Monthly Team Meeting
2091	October 9, 2012 Google Calendar reminder re accuracy requirements walk through
2092	October 10, 2012 Google Calendar reminder re Accuracy Bi-weekly
2093	October 24, 2012 Google Calendar reminder re Accuracy Bi-weekly
2094	October 4, 2012 Email from Scott Kirk to John West re Notes from the runs discussion
2095	October 10, 2012 Email from Scott Kirk to John West, et al., re PGS v1 Requirements draft (rev 1.10) with attachment
2096	October 9, 2012 Email from John West to Richard Chen, et al., re Slide for accuracy requirements walkthrough meeting 3-5pm today with attachment

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2097	October 12, 2012 Email from John West to Christian Haudenschild, et al., re Prioritization of Ops Sequencing projects with attachment
2098	October 19, 2012 Email from John West to Richard Chen, et al., re Applying for a patent on our idea of panels reflecting to exome / WGS
2099	November 1, 2012 Email from John West to Carol Tillis re Board slides from John West, ready to print with attachment
2100	October 31, 2012 Email from Richard Chen to John West, et al., re final board slides, ready to print with attachment
2101	November 1, 2012 Google Calendar reminder re Personalis BOD Meeting – Breakfast will be served between 8:15am and 9am
2102	November 1, 2012 Email from Shujun Luo to John West re Re: Can you please email me a copy of your slides from this afternoon? with attachment
2103	November 21, 2012 Google Calendar reminder re Accuracy Bi-weekly
2104	December 7, 2012 Google Calendar reminder re Accuracy Bi-weekly
2105	December 12, 2012 Email from Richard Chen to John West, et al., re Final board slides with attachment
2106	December 13, 2012 Email from John West to Carol Tillis re CEO Update presentation for Board meeting with attachment

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2107	December 14, 2012 Minutes of a Meeting of the Board of Directors of Personalis, Inc.
2108	January 16, 2013 Google Calendar reminder re Accuracy Bi-weekly
2109	January 13, 2012 Email from John West to Richard Chen re Draft of what we might offer as Laboratory Assays with attachment
2110	July 26, 2011 Minutes of a Meeting of the Board of Directors of Personalis, Inc.
2111	November 01, 2012 Minutes of a Meeting of the Board of Directors of Personalis, Inc.
2112	May 08, 2012 CEO Overview Board of Director Presentation by John West
2113	U.S. Provisional Patent Application No. 61/753,828
2114	January 19, 2010 Illumina Individual Genome Sequence Report
2115	January 18, 2011 Slides, “Incoming Data QC and our ability to detect commonly known genetic diseases”
2116	June 18, 2012 Email from John West to Mark Pratt, et al. re Shunjun getting started
2117	January 11, 2013 Email from John West to Richard Chen re Name instead of “Exome+”

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2118	August 14, 2012 Google calendar reminder re Personalis BOD Meeting
2119	January 14, 2013 Email from John West to Carol Tillis, et al. re Product naming decisions from staff meeting today
2120	May 17, 2012 Email from John West to Mark Pratt re Update Job Description for Shujun
2121	A Family Learns the Secrets of Its Genomes, MIT Technology Review, June 16, 2011
2122	Dewey, et al., Phased Whole-Genome Genetic Risk in a Family Quartet Using a Major Allele Reference Sequence, PLoS Genetics, September 2011, Vol. 7(9)
2123	November 2, 2012 Google calendar reminder re Personalis monthly team meeting
2124-2150	RESERVED
2151	Foresight Diagnostics, About, https://foresight-dx.com/about
2152	Newman, et al., An ultrasensitive method for quantitating circulating tumor DNA with broad patient coverage, HHS Public Access Author Manuscript
2153	“Personalis MRD Assays to Support UK’s TRACERx ctDNA Monitoring Study,” Precision Medicine Online, April 5, 2023
2154	“Personalis, AstraZeneca Extend Collaboration Around Residual Cancer Detection Test,” GenomeWeb, March 7, 2023

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2155	Blighe, Molecular analysis of circulating cell-free DNA in breast cancer patients, University of Leicester, 2012.
2156	Labrousse, “MATRIX plasma-in-plasma contrived samples assessment and detection of MRD using the Personalis NeXT Personal assay,” American Society of Clinical Oncology, e15056, 2023.
2157	DeRienzo and Quackenbush et al., “Gender-Specific Molecular and Clinical Features Underlie Malignant Pleural Mesothelioma,” Cancer Research, 76:319-28, 2015
2158	Sathirapongsasuti and Quackenbush et al., “Exome sequencing-based copy-number variation and loss of heterozygosity detection: ExomeCNV,” Bioinformatics 27:2648-2654, 2011
2159	Chilamakuri, “Performance comparison of four exome capture systems for deep sequencing,” BMC Genomics 15:449, 2014
2160	Excerpt from Sambrook, et al., Molecular Cloning, Vol. 1, 2001
2161	RESERVED
2162	Stephens et al., Complex landscapes of somatic rearrangement in human breast cancer genomes, Nature, 462:1005-1010 (2009) supplementary figures
2163	<i>Personalis, Inc. v. Foresight Diagnostics Inc.</i> November 29, 2022 Stipulated Protective Order, Case No. 1:22-cv-01913-CNS-NRN (D. Colo.)
2164-2177	RESERVED

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2178	The Chicago Manual of Style, 16th ed., University of Chicago Press, Chicago IL, 2010
2179-2180	RESERVED
2181	Dudley and Diehn, “Detection and Diagnostic Utilization of Cellular and Cell-Free Tumor DNA,” <i>Annu. Rev. Pathol. Mech. Dis.</i> 16:199-222 (2021), Exhibit 2166 from <i>Foresight v. Personalis</i> , IPR2023-00545
2182-2184	RESERVED
2185	Chaudhuri, Alizadeh, Diehn et al., “Predicting Radiotherapy Responses and Treatment Outcomes Through Analysis of Circulating Tumor DNA,” <i>Semin Radiat Oncol</i> 25:305-312 (2015), Exhibit 2165 from <i>Foresight v. Personalis</i> , IPR2023-00545
2186	Bratman, Alizadeh, Diehn et al., “Potential clinical utility of ultrasensitive circulating tumor DNA detection with CAPP-Seq,” <i>Expert Rev Mol Diagn</i> 15:715-719 (2015), Exhibit 2164 from <i>Foresight v. Personalis</i> , IPR2023-00545
2187	RESERVED
2188	Transcript of the deposition of John Quackenbush, Ph.D., taken on February 1, 2024

I. INTRODUCTION

Personalis produced overwhelming evidence of inventor conception by May 8, 2012, and diligence through the filing of its provisional application. This evidence is corroborated by two witnesses and over 80 exhibits. Foresight fails to rebut the compelling evidence of prior invention, and therefore fails to establish that Forshew and Chan are prior art. Each of Grounds 1-3 necessarily fails because they rely on either Forshew or Chan.

Personalis identified other fatal deficiencies with each of Grounds 1-3. The most glaring of these deficiencies is Foresight's construction of "capture probes" as encompassing "PCR primer capture probes." Dr. Quackenbush admitted that there is no such thing as a "PCR primer capture probe," and Foresight's Reply abandons this term. Foresight failed to identify a single instance where a PCR primer is referred to as a "capture probe." Foresight correctly quoted Dr. Furneaux's explanation of Foresight's construction as being "quite simply ridiculous." Reply 13. This sentiment accurately reflects Personalis's belief that it would suffer severe prejudice if Foresight's construction of "capture probes" were adopted in the Board's final written decision. Ground 1 fails because Forshew discloses a PCR primer-based assay, which a POSA would not conflate with the plain meaning of the claimed capture probes.

Turning to Ground 2, the record provides a host of reasons why a POSA would not have been motivated to redesign Forshew's PCR primer-based assay to instead use Wagle's capture probes based on issues concerning specificity, uniformity, reproducibility, expense, and difficulty implementing capture probes. Each of these reasons are explained within Foresight's own exhibits. Foresight's Reply fails to adequately respond to these issues and, instead, seeks to have them overlooked. But "the benefits, ***both lost and gained***, should be weighed against one another," which is "consistent with the longstanding principle that the prior art must be considered for all its teachings, not selectively." *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1331-32 (Fed. Cir. 2019) (emphasis in original). When the prior art is considered for all its teachings, including Foresight's own exhibits, as well as statements by its own Founders and its expert witness, a POSA would not have been motivated to abandon the core reaction principle of Forshew's PCR primer-based assay for Wagle's capture probes.

For Ground 3, Foresight admits that Wagle does not meet limitation 1(d), which requires repeating steps (b)-(c) on a subsequently obtained biological sample from the individual. Personalis demonstrated that a POSA would have avoided repeating Wagle's assay on a subsequently obtained tumor sample because it would involve subjecting the patient to a second invasive operation procedure. Personalis demonstrated that a POSA would not have used Wagle's capture probes on the

miniscule amounts of DNA circulating in a patient's plasma sample with a reasonable expectation of success because Wagle teaches that capture probes require orders of magnitude more DNA than is present in a sample of a patient's plasma. Foresight's Reply does not fix either of these issues, and its position on Wagle goes against statements by its Founders.

Based on the full trial record, it is clear that Foresight has not proven unpatentability by a preponderance of the evidence. Further, even "if the fact trier of the issue is left uncertain, the party with the burden [the petitioner] loses," which is the only reasonable outcome of this proceeding. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378-79 (Fed. Cir. 2015).

II. FORSHEW AND CHAN ARE NOT PRIOR ART

"In an IPR, the petitioner bears the ultimate burden of persuasion on invalidity, which never shifts to the patent owner." *Medtronic, Inc. v. Teleflex Innovations SARL*, 68 F.4th 1298, 1303 (Fed. Cir. 2023). When a patent owner antedates a reference, "the patent owner takes on a temporary burden of production." *Id.* "Once that burden is met, the burden shifts back to the petitioner." *Id.*

Personalis produced overwhelming evidence of inventor conception by May 8, 2012 and diligence through filing its provisional application, which was corroborated by two witnesses and over 80 exhibits. Patent Owner Response ("POR") 5-54. Foresight fails to rebut the compelling evidence of prior invention,

and therefore fails to establish that Forshew and Chan are prior art. Each of Grounds 1-3 necessarily fails because they rely on either Forshew or Chan.

A. Inventorship

Foresight speculates that it is “implausible” that Dr. Bartha participated in conception by May 8, 2012. Reply 3-4. Mr. West explained that Dr. Bartha joined Personalis on May 1 and “was immediately tasked with working on the Accuracy Program under Mark Pratt.” EX2032 ¶34. Mr. West’s testimony is undisputed, and it is supported. EX2042 Slides 3, 27. Foresight’s unsupported speculation does not carry its burden. *Medtronic*, 68 F.4th at 1303.

Foresight seeks a broad rule against antedation because Ms. Luo was not hired until June 18, 2012. Reply 2-3. However, “[t]he determination of whether a person is a joint inventor is fact specific, and no bright-line standard will suffice in every case.” *Vanderbilt Univ. v. ICOS Corp.*, 601 F.3d 1297, 1308 (Fed. Cir. 2010). “***All inventors, even those who contribute to only one claim or one aspect of one claim of a patent, must be listed on that patent.***” *Vapor Point LLC v. Moorhead*, 832 F.3d 1343, 1348-49 (Fed. Cir. 2016).¹

As of May 8, 2012, all of the inventors (minus Ms. Luo) had conceived of claim 4. EX2032 ¶¶142-144. In August of 2012, Ms. Luo improved the “variable

¹ All emphasis supplied unless otherwise noted.

length tandem repeat” aspect of claim 4 by “identif[ying] a DNA sequencing chemistry which could provide enough reads in regions of certain difficult VNTR’s (variable length tandem repeats) that the lobSTR algorithm could correctly call them.” *Id.* ¶369; EX2075 1, 7, 27. Thus, claim 4 was conceived by May 8, 2012, and further improved in August 2012. Ms. Luo’s contribution in August makes her a joint inventor of the ’033 patent. *Ethicon, Inc. v. U.S. Surgical Corp.*, 937 F.Supp. 1015, 1036 (D.Conn. 1996) (“If a prior invention of one inventor is modified as a result of the collaborative effort of joint inventors, the modified invention may become a joint invention.”), *aff’d* 135 F.3d 1456 (Fed. Cir. 1998).

B. NeXT Personal

Foresight irrelevantly disputes the inventors’ 2012 conception based on NeXT Personal being launched in 2021. Reply 4-5. Conception does not require a commercial product. *Scott v. Finney*, 34 F.3d 1058, 1063 (Fed. Cir. 1994) (“courts have not required commercial perfection nor absolute replication of the circumstances of the invention’s ultimate use”).

Foresight argues that NeXT Personal cannot embody the claims of multiple patents. Reply 6. Foresight is wrong. *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 526 F. Supp.2d 162, 176 (D.Mass. 2007) (“The defendants argue that because the plaintiffs’ products reflect other patents, in addition to the ’678 patent, the plaintiffs cannot prove that these devices’ commercial success is attributable to

the '678 patent. The Court disagrees.”), *aff’d-in-part, rev’d-in-part, and rem’d on other grounds* 567 F.3d 1314 (Fed. Cir. 2009). Expert testimony demonstrates that the NeXT Personal assay embodies the claims of each patent. Thus, nexus is presumed, which “cannot be rebutted with mere argument.” *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000).

C. Corroboration

Foresight submits immaterial testimony about what it believes *a POSA* would have understood by reviewing Slide 5 of EX2112 regarding the capture probes recited by limitation 1(a). Reply 6-9. “For conception, we look not to whether one skilled in the art could have thought of the invention, but whether the alleged inventors actually had in their minds the required definite and permanent idea.” *Burroughs Welcome Co. v. Novopharm, Inc.*, 40 F.3d 1223, 1232 (Fed. Cir. 1994). The presentation “is not itself a conception, for conception occurs in the inventors’ minds, not on paper.” *Id.* 1230. The presentation corroborates Mr. West’s testimony. *Id.* More importantly, Mr. West’s testimony regarding capture probes for limitation 1(a) is corroborated by several exhibits. *See* EX2032 ¶¶91-103 (citing EX2112, Slides 4, 5; EX2036; EX2109, Slide 2). His testimony regarding all aspects of limitation 1(a) is corroborated by even more exhibits. *Id.* ¶¶91-109 (citing EX2112, Slides 4, 5; EX2109, Slide 2; EX2036; EX2042, Slides 29-32; EX2043 2; EX2044; EX2038; EX2039; EX2040). These same exhibits corroborate the use of

the capture probes produced in limitation 1(a) in limitations 1(b) and 1(c). *Id.* ¶¶110-114 (limitation 1(b)); *id.* ¶¶115-118 (limitation 1(c)).

Foresight incorrectly states there is no corroboration for repeating steps (b)-(c) on a subsequently obtained biological sample from said individual for limitation 1(d). Reply 9-10. Mr. West’s testimony is corroborated. EX2032 ¶¶119-134 (citing EX2112 Slides 3, 5; EX2030; EX2046, Slide 13; EX2114 4). Foresight misreads the cited evidence as only showing that “Personalis contemplated sequencing the same sample twice to assess sequencing errors” rather than “taking samples from an individual at different time points.” Reply 10. Mr. West’s January 6, 2012 presentation described sequencing an individual “twice (or more?)” or “multiple times” using “Whole Genome Plus” or “Exome Plus” to confirm results from an initial sample. EX2032 ¶125 (citing EX2046, Slide 13). This involves assaying different samples from an individual obtained at different time points (e.g., “twice (or more?)” or “multiple times”) with capture probes (e.g., using Personalis’s “Whole Genome Plus” or “Exome Plus” assay). *Id.* ¶125; *see also id.* ¶¶54-56, 76 (describing Personalis’s “Whole Genome Plus” and “Exome Plus” as using capture probes). Further corroboration for limitation 1(d) includes EX2030, which discloses a patient “being monitored using blood tests” at “20 time points over 400 days.” *Id.* ¶126. Exhibit 2030 sparked the inventors connection of “the frequent genetic analysis from blood with [their] development of targeted capture based on the

genetic variants of an individual person.” *Id.* ¶¶127. Accordingly, limitation 1(d) is corroborated.

Foresight incorrectly cites *Sprint Spectrum*, IPR2017-01855, for the proposition that corroboration is required for each and every claim limitation. Reply 8. The Federal Circuit has explained that corroboration is evaluated under a “rule of reason” that does not require corroboration for every point of an invention because that would be the antithesis of the rule of reason:

[E]vidence [of corroboration] is evaluated under “the rule of reason,” whereby all pertinent evidence is examined in order to determine whether the inventor’s story is credible. ***Importantly, the law does not impose an impossible standard of independence on corroborative evidence by requiring that every point of a reduction to practice be corroborated by evidence having a source totally independent of the inventor; indeed, such a standard is the antithesis of the rule of reason.***

Fleming v. Escort Inc., 774 F.3d 1371, 1377 (Fed. Cir. 2014) (holding corroborative evidence is evaluated under a “rule of reason” and need not include all claim limitations). Mr. West’s testimony regarding conception and diligence is appropriately corroborated.

During deposition, Mr. West identified a single paragraph in his declaration that needed correction concerning the occurrence of a Board of Directors meeting. EX1222 17:15-21:2. Foresight incorrectly infers that this single error renders his

entire declaration untrustworthy. Reply 10-11. The opposite is true. The fact that Mr. West’s declaration, which is over 200 pages long, contains just one error (which has now been corrected) speaks to the veracity and accuracy of the document as a whole.

D. Constructive reduction to practice

Foresight incorrectly cites *Bigham* (an interference case) to assert that Personalis is required to prove written description support in an IPR. Reply 12. In an IPR, antedation requires “(1) conception prior to the filing date of the asserted reference and (2) reasonably continuous diligence” through the constructive reduction to practice. *Medtronic, Inc. v. Teleflex Innovations SARL*, 86 F.4th 902, 906 (Fed. Cir. 2023). Personalis has met those two requirements.

Foresight untimely asserts—without any explanation—that “there is no disclosure of step 1(d), contacting samples taken at different time points to a set of capture probes produced per step 1(a).” Reply 13. Foresight and Dr. Quackenbush previously conceded the January 2013 provisional priority date. Petition 4-5, 27; EX1020 ¶¶33, 36-37, 39, 205. Foresight cannot reverse course on Reply, and its conclusory assertions cannot carry its burden. Regardless, limitation 1(d) is supported by EX2113 ¶¶[0024], [0078]-[0079], [0171]-[0172], [0193].

III. GROUND 1

Forsheew is not prior art to the '033 patent. Also, Forsheew does not teach the “capture probes” required by claim 1.

A. Limitation 1(a): capture probes

The Board preliminarily adopted Foresight’s construction of “capture probe” as encompassing “PCR primer capture probes and solution-based hybridization capture probes.” Institution Decision (“Decision”) 18-24. Foresight’s construction cannot stand.

First, Dr. Quackenbush admitted “PCR primer capture probe” does not exist in the literature. EX2018 166:10-169:1. Foresight’s Reply makes no defense of this term.

Second, the term “capture probe” is used exclusively to refer to hybridization capture. EX1007 115-16. *Foresight fails to identify any prior art instance of “capture probe” referring to PCR primers.*

Third, Foresight’s exhibits explain that hybridization capture has a different core reaction principle than PCR primers: capture probes can *physically capture and isolate* target DNA, while PCR primers *amplify/copy*. EX1006 375; EX2031 ¶¶67-68; POR 60-62. Foresight concedes that “Wagle’s [capture probe] approach enriches *by isolating the targets and removing them* from non-targeted nucleic acids

in the sample. Forshew's [PCR primer] approach *copies* the targets and thereby enriches them over non-targeted nucleic acids." Petition 48.

Foresight incorrectly believes that PCR primers are "capture probes" simply because PCR primers contain a nucleic acid binding site. Reply 15. A molecule is not a capture probe merely because it contains a nucleic acid binding site. Dr. Quackenbush admitted that "it would be hard for me to think of any technology where capture would simply occur the moment hybridization occurred." EX2018 116:1-117:8. He also admitted that PCR and hybridization capture are "different approaches" with different "pros and cons" that need to be evaluated "depending on the needs of their experiment." EX1225 ¶52. A POSA would not conflate PCR primers with capture probes.

1. Personalis's construction is consistent with the specification

The parties agree the specification does not define the term "capture probe." Foresight incorrectly argues that "capture probes" must encompass PCR primers because the specification does not state that "capture probes" and PCR primers are mutually exclusive, Reply 14, and because the claims do not explicitly require physically capturing DNA, *id.* 15-16. Foresight ignores that "capture probe" has a plain meaning in the art that includes the functional requirement that one must be able to physically capture the target DNA. POR 55-66.

Foresight incorrectly asserts that this functional requirement is inconsistent with alternative embodiments described in the specification. Reply 15-16. Such alternative embodiments are not inconsistent with Personalis's construction. POR 56, 60-63. "The mere fact that there is an alternative embodiment disclosed in the asserted patent that is not encompassed by our claim construction does not outweigh the language of the claim." *August Technology Corp. v. Camtek, Ltd.*, 655 F.3d 1278, 1285 (Fed. Cir. 2011). The term should be given its plain meaning. *V-Formation, Inc. v. Benetton Group SpA*, 401 F.3d 1307, 1311 (Fed. Cir. 2005).

Foresight's objection to the term "target DNA" in Personalis's construction, Reply 15-17, is baseless. Foresight and Dr. Quackenbush repeatedly refer to "target DNA" as the type of DNA captured by capture probes. Petition 12; EX1020 ¶¶78, 103; EX1225 ¶¶100, 103. The prior art uses "target DNA" and "targeted DNA" with capture probes. EX1007 112, 115. Personalis consistently referred to "target DNA" with "capture probes" throughout this proceeding without previous objection by Foresight. POPR 19-20, 25.

Foresight distorts the West transcript to argue that a "pulldown probe" refers only "to a biotinylated oligonucleotide bait." Reply 14-15. Mr. West explained that a pulldown probe includes any chemical modification that allows the capture probe to be pulled. EX1222 83:18-84:12.

Foresight argues that capture probes must include ubiquitous PCR primers because the record does not contain an example of a “barcoded biotinylated oligonucleotide.” Reply 15. Personalis provided an example of the claimed barcoded capture probe, which is distinct from a PCR primer. POR 63; EX2028 251; EX2031 ¶70.

Foresight argues that because the proposed construction does not exclude array-based capture, the construction must also include PCR primers. Reply 17. The literature describes on-array hybrid capture and in-solution capture as using “capture probes,” but places PCR primers in a separate category. EX1006 Table 1; EX1007 112, 115.

2. PCR primers are not equivalent to capture probes

Foresight fails to identify a single instance of PCR primers being referred to as “capture probes.” Instead, Foresight identifies three instances where the words “PCR” and “capture” were used in the same sentence. Reply 18. Two instances come from the same laboratory—the author of EX1216 was a co-author of Forshew (EX1030). EX2188 16:1-17:14. More importantly, EX1216 places the word “capture” in scare quotes, which indicates that “capture” was used in a nonstandard manner. EX2178 7-55 (“scare quotes”); EX2188 32:9-33:8, 49:1-50:9 (“the scare quotes that you referred to earlier are a way of altering us to the fact that this is a

broad definition”). These isolated, nonstandard uses of “capture” in the same sentence as “PCR” fail to establish PCR primers are “capture probes.”

Foresight truncates a portion of Mr. West’s transcript to assert that PCR primers qualify as “capture probes,” which is a noun. Reply 17-18. Foresight slipped the verb “capture” into the tail end of a question. Mr. West appropriately clarified under oath on redirect that he did not hear the word “capture” during questioning. EX1222 170:15-171:10. Redirect examination is appropriate “to clarify facts that were not made sufficiently clear” during cross examination. *Taskett v. Dentlinger*, 344 F.3d 1337, 1343 (Fed. Cir. 2003). Foresight failed to directly ask Mr. West if he considers PCR primers to be “capture probes.”

3. Forshew’s PCR primers are not capture probes

A POSA would not confuse Forshew’s PCR primers with capture probes. Dr. Quackenbush’s articles that consistently recognize capture probes and PCR primers as different, non-overlapping types of nucleic acids remain unrebutted. POR 62 (quoting EX2158, EX2157); EX2188 116:7-118:19.

Dr. Quackenbush admitted that PCR primers were preferable for Sanger sequencing, EX2188 121:10-13, which was performed on Forshew’s amplicons, EX1030 3-4. He admitted that if a POSA used capture probes for Sanger sequencing, they would additionally “have to do targeted PCR on whatever was captured to allow the Sanger sequencing reactions.... So it would be an additional

step....” EX2188 123:22-124:16; *id.* 120:1-123:21. There was no motivation to complicate Forshew’s workflow with capture probes because PCR must still be performed.

Foresight argues that Forshew’s PCR primers are capture probes because amplicons can be physically isolated in subsequent assay procedures. Reply 18-19. Forshew’s PCR primers operate via a fundamentally different “core reaction principle” from capture probes. EX1006 375. PCR can only copy DNA to preserve sequence information—it cannot physically isolate the target DNA molecules. POR 65; EX2031 ¶¶71-74. While PCR primers and capture probes are both “enrichment” techniques, Foresight has no reply to:

- Its exhibit’s explanation that PCR and capture probes have different “operational characteristics,” “vary in their suitability for different fields,” and give “very divergent” results. *Id.* 375, 383; POR 63-64.
- Its exhibits and expert’s explanations that a POSA would evaluate seven parameters/metrics to weigh pros and cons before selecting PCR primers or capture probes for an experiment. POR 64-66, 72-73; EX1225 ¶52; EX2188 51:19-54:3, 64:12-65:15, 70:13-71:8, 105:19-108:1.
- Its Founder’s admission that hybrid capture-based workflows “typically have longer turnaround times, since the target enrichment process often takes days (instead of hours with PCR), and are more expensive.” EX2181 203.

These many distinctions between PCR primers and capture probes are unrebutted by Foresight, and it fails to prove that Forshew's PCR primers meet the claimed capture probes.

B. Limitation 1(b): plurality of capture probes

Under the correct construction of "capture probes," Forshew's PCR primers do not meet limitation 1(b). POR 66-67.

C. Forshew does not teach limitation 1(c)

Foresight argues that Forshew meets limitation 1(c) because amplicons are generated from PCR primers. Reply 19-20. Forshew does not anticipate limitation 1(c) because its sequencing assay is not conducted on molecules captured by contacting capture probes with the nucleic acid sample. POR 67-68.

D. Forshew does not teach limitation 1(d)

Forshew does not disclose limitation 1(d) because it never conducts steps (b) and (c) to begin with, let alone repeat them. POR 68.

IV. GROUND 2

Forshew and Wagle do not render the claims obvious because Forshew is not prior art to the '033 patent. In addition, Foresight failed to prove that a POSA would have been motivated to modify Forshew in view of Wagle to arrive at the claimed invention.

A. No motivation to modify Forshew

If a POSA had somehow considered abandoning Forshew's PCR primer-based method to instead use Wagle's capture probes, they would have found several reasons *not* to do so based on issues with specificity, uniformity, and reproducibility (POR 72-74), as well as expense, difficulty implementing capture probes, and known negative influences of PCR amplification on capture probes (POR 74-76). Each of these reasons are explained in Foresight's own exhibits. *Id.*

Foresight seeks to avoid the teachings of its own exhibits by wrongly arguing that it proved obviousness simply by asserting "there was a known problem in the art, that Wagle's capture probes helped address." Reply 20. This argument is wrong for at least two reasons.

First, Foresight fails to articulate any known problem in the art with Forshew's PCR approach that would have motivated a POSA to turn to Wagle's capture probes. Foresight vaguely alleges there were some "perceived drawbacks" to Forshew, but fails to describe what those drawbacks might have been and how Wagle's capture probes would supposedly alleviate those unnamed drawbacks. Petition 47.

Second, Foresight has not articulated any motivation supported by rational underpinnings as to why it believes a POSA would abandon Forshew's PCR-based assay for Wagle's capture probes. Foresight's empty assertions fail to demonstrate unpatentability because "there must be some articulated reasoning with some

rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (a finding of a motivation to combine “must be supported by a reasoned explanation”).

Foresight’s exhibits and expert explain that a POSA would evaluate seven parameters/metrics to weigh pros and cons before selecting either PCR primers or capture probes for any given experiment. POR 64-66, 72-74; EX1225 ¶¶52; EX2188 51:19-54:3, 64:12-65:15, 70:13-71:8, 105:19-108:1. Foresight unbelievably asserts that the seven parameters/metrics framework is “concocted-for-this-proceeding.” Reply 20. The seven metrics/parameters are set forth in Foresight’s own Mertes and Mamanova exhibits. EX1006 380; EX1007 111. The record is clear that PCR primers and capture probes have different core reaction principles, and different pros and cons, that must be evaluated according to the unique needs of each experiment.

Foresight cannot prove obviousness without articulating the pros and cons that a POSA would have evaluated before deciding to change the core reaction principle of Forshew’s PCR-based assay for Wagle’s capture probes. “[I]t is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” *In re Hedges*, 783 F.2d 1038, 1041 (Fed. Cir. 1986).

Foresight cannot be excused from its refusal to engage on these issues because “[t]he benefits, *both lost and gained*, should be weighed against one another.” *Henny Penny*, 938 F.3d at 1332 (emphasis in original).

Personalis provided a detailed evaluation of those pros and cons with the aid of expert testimony, which confirms that a POSA would *not* have abandoned Forshe’s PCR-based assay for capture probes in view of concerns with specificity, uniformity, reproducibility, expense, difficulty implementing capture probes, and potential negative influences of PCR amplification on capture probes. POR 72-76; EX2031 ¶¶211-218. Foresight’s Reply merely provides a cryptic nested citation to Dr. Quackenbush’s declaration to allege that he “evaluat[ed] considerations for selection of particular enrichment techniques.” Reply 21. The cited portions of Dr. Quackenbush’s declaration treat PCR primers and capture probes as “interchangeable,” which at most asserts that a POSA *could* substitute one for the other, but fails to explain why a POSA *would* have wanted to change the core reaction principle of Forshe’s particular PCR-based assay for Wagle’s capture probes. Foresight fails to prove obviousness because “obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.” *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (emphases in original).

B. Forshew's insufficient quantity of DNA for use with capture probes

Personalis explained that Forshew's assay had insufficient quantities of DNA to be used with Wagle's capture probes. POR 69-72; EX2031 ¶¶204-210. In Reply, Foresight newly alleges that a POSA could have modified Forshew's assay to use a 1 ml sample of plasma. Reply 22. The concentration of DNA in Forshew's samples ranged from 12.9-123ng/ml. EX1030, Table 2; EX2188 252:16-254:4. Blighe similarly teaches that the concentration is about 1-100ng/ml. EX2155 28-29 ("it can be found at a concentration of roughly 1ng/ml" and "in some disease settings, the concentration can be elevated to as much as 100ng/ml"). Even at a 1 ml volume, the amount of DNA in Forshew's sample is between 29-279 times less than the 3,600 nanograms required for Wagle's capture probes.

Foresight's Reply newly alleges that a POSA could obtain additional blood draws from Forshew's patients to increase the volume of blood available to use in Forshew's assay. Reply 22. Foresight, however, provides no reason why a POSA would have increased the volume in this manner. Foresight admits that Forshew's goal was to show that its method "could work on samples containing even single copies of ctDNA." Reply 21. Foresight's position that a POSA would modify Forshew's sample collection process to use multiple large volume blood draws from each patient to obtain large amounts of DNA to facilitate Wagle's capture probes goes directly against Forshew's stated goal of using "minute" amounts of DNA.

Foresight's petition alleged that a POSA would have been motivated to use Wagle's capture probes in place of Forshew's PCR amplification. Petition 47. Foresight's reply cuts against this supposed motivation. Foresight's Reply explains that Wagle needed to PCR amplify source DNA to generate the 3,600 ng of DNA required for using capture probes. Reply 22. A POSA would not use Wagle's capture probes in place of Forshew's PCR amplification because, without PCR amplification, there would not be sufficient DNA to use Wagle's capture probes. Moreover, if a POSA chose to retain Forshew's specific TAm-Seq PCR approach to amplify DNA, then there would be no reason to add capture probes to Forshew's approach (because Forshew's TAm-Seq PCR approach would have already enriched the desired sequences, so there would be no need to add capture probes as an additional enrichment technique).

C. Forshew recommends *not* using Wagle's capture probes

Forshew teaches that Wagle's capture probes "ha[ve] not been applied for analysis of circulating tumor nucleic acids," EX1030 9, and are "expensive," EX1030 10. POR 71. Foresight asks the Board to overlook Forshew's teachings that would discourage a POSA from pursuing Wagle's capture probes. Reply 22-23. But "it is error to fail to consider the entirety of the art," including where references "suggest[] reasons that a skilled artisan would be discouraged from pursuing such a combination." *Arctic Cat Inc. v. Bombardier Recreational Products Inc.*, 876 F.3d

1350, 1360, 1363 (Fed. Cir. 2017). Forshew’s teachings must be taken in the context of what was known in the field about capture probes. For example, Mamanova teaches “[t]here are several enrichment approaches, each with unique advantages and disadvantages” such that a user must “find the best compromise between sensitivity, specificity and uniformity for their particular project.” EX1007 111. Forshew’s express teachings about the disadvantages of Wagle’s capture probes would have been considered by a POSA and provide significant evidence against Foresight’s proposed combination.

D. Foresight fails to articulate its proposed Forshew/Wagle combination with particularity

Petitioner asserts there is a “clear explanation” in its Petition as to how Forshew would be modified to include *both* PCR primers and capture probes. Reply 23 (citing Petition 47). No such explanation is provided there or anywhere else in the Petition. Petitioner amorphously states “a POSA would have been motivated to use hybridization followed by PCR, or vice-versa, in some scenarios in order to further enrich a target sequence to further improve and refine results as compared to performing either step alone.” Petition 48. Foresight provides no explanation as to which of Forshew’s “scenarios” would benefit from “hybridization followed by PCR, or vice versa.” Foresight does not articulate which results from Forshew it believes need further improvement or refinement. Foresight attempts to justify its vagueness by asserting it need not show how Forshew and Wagle are “bodily

incorporated.” Reply 23-24. However, “[a] petitioner may not rely on a vague, generic, and/or meandering petition.... it is the petitioner’s burden to present a clear argument.” *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023); 35 U.S.C. 312(a)(3). Foresight failed to carry its burden of presenting a clear argument as to what aspect of Forshe’s workflow it believes a POSA would have sought to improve, and how the addition of Wagle’s capture probes would have supposedly provided the unnamed improvement.

V. GROUND 3

Wagle and Chan do not render the claims obvious because Chan is not prior art to the ’033 patent. In addition, Wagle in view of Chan does not teach or suggest limitation 1(d).

Foresight admits that “Wagle did not repeat steps (b)-(c) because of the sample type and also because it was an interrogation of tumor tissue to personalize cancer treatment (as opposed to tumor monitoring over time) and did not require repeating.” Petition 67.

Foresight asserts that a POSA would have been motivated to repeat Wagle’s solution-based exon capture and massively parallel sequencing approach on (i) “subsequently obtained *tumor* samples,” or (ii) “plasma samples that included cell-free tumor DNA.” Petition 67. Foresight is wrong on both accounts.

First, Personalis explained that a POSA would not have been motivated to repeat Wagle's assay on a subsequently obtained **tumor** sample from the same patient because obtaining a second tumor sample from Wagle's patient would require an undesirable invasive procedure, add additional expense, and increase the already-long turnaround time for Wagle's approach. POR 78. In reply, Foresight alleges that Forshaw "discloses obtaining multiple biopsies from patients" in Figure 4. Reply 25. Forshaw's Figure 4 does not teach that any subsequently obtained **tumor** biopsies were obtained from any patients. In fact, the legend to Forshaw's Figure 4 expressly states that "[a]t relapse, a biopsy was **not** performed." EX1030, Figure 4(E). Thus, Forshaw does not disclose obtaining multiple **tumor** samples from patients. Forshaw expressly teaches that "[b]iopsies are invasive and costly," EX1030 1, which highlights why a POSA would not have repeated Wagle's assay on subsequently obtained tumor samples. POR 78; EX2031 ¶¶222-225.

Second, Personalis explained that a POSA would not have repeated Wagle's assay on a plasma sample that included cell-free tumor DNA because cell-free tumor DNA is not present in sufficient quantities to have motivated a POSA to use Wagle's capture probes on a plasma sample containing nanogram amounts of DNA with a reasonable expectation of success. POR 78-79. In reply, Foresight asserts that a POSA would use Wagle's capture probes on plasma samples that included cell-free tumor DNA. Reply 25. This assertion ignores the complexities a POSA would have

faced by Foresight’s proposal. For example, Foresight’s Founders—years after the ’033 patent filing date—described the “major technical challenge” of analyzing cell-free tumor DNA and explained “highly sensitive techniques are necessary for reliable detection and quantitation of the tumor-derived fraction.” EX2186 715. As another example, Foresight’s Founders wrote in 2015 that “techniques that are sensitive and specific enough to robustly detect ctDNA have only become available recently.” EX2185 305. Foresight provides no explanation how a POSA would have been motivated to modify Wagle’s workflow to analyze the tiny amounts of DNA in Chan’s cell-free tumor DNA plasma samples with a reasonable expectation of success in view of its own Founders describing major technical challenges of doing so.

Foresight’s reply further asserts that a POSA would amplify the cell-free tumor DNA before using Wagle’s capture probes. Reply 25. This assertion is belied by Forshew, which demonstrates that amplification of cell-free tumor DNA required three rounds of specific TAm-Seq PCR amplification with primers directed to regions of interest. EX1030 3 and Figure 1(B); EX2031 ¶207. If a POSA were to use TAm-Seq PCR to preferentially amplify the cell-free tumor over the rest of the DNA contained in the plasma, then there would be no need to use Wagle’s capture probes because the desired cell-free DNA would already have been enriched during

the TAm-Seq PCR step. For at least the foregoing reasons, Foresight has not proven that a POSA would modify Wagle to arrive at limitation 1(d).

VI. OBJECTIVE INDICIA OF NONOBVIOUSNESS

A. Nexus

Dr. Furneaux provided a detailed explanation of nexus that confirmed the pre-institution evidence submitted in this case, which Foresight does not substantively address. Reply 25-56. Nexus is therefore unrebutted. *Brown & Williamson*, 229 F.3d at 1130.

B. Industry Praise

Foresight asserts that the Scientist's praise of NeXT Personal is an "overstatement." Reply 26. The recognition is clear from EX2001. Foresight's argument that the industry praise lacks nexus, Reply 26-27, fails to rebut Personalis's showing of nexus. POR 79; EX2031 ¶228.

C. Skepticism

Foresight provides no substantive response to the real-world evidence of skepticism that supports nonobviousness.

Respectfully submitted,

WEIL, GOTSHAL & MANGES LLP

Dated: February 13, 2024

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Foresight Diagnostics Inc. v. Personalis, Inc.
IPR2023-00317

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), Counsel for Patent Owner Personalis, Inc. hereby certifies that this document complies with the type-volume limitation of 37 C.F.R. § 42.24(b). This document contains approximately 5,582 words, including any statement of material facts to be admitted or denied in support, and excluding the table of contents, table of authorities, mandatory notices under § 42.8, exhibit list, certificate of service or word count, or appendix of exhibits or claim listing.

Dated: February 13, 2024

/Derek C. Walter/

Derek C. Walter,
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CERTIFICATE OF SERVICE

I hereby certify that, pursuant to 37 C.F.R. § 42.6(e) and with the agreement of counsel for Petitioner, a true and correct copy of **PATENT OWNER’S SUR-REPLY TO PETITIONER’S REPLY TO PATENT OWNER’S RESPONSE AND EXHIBITS 2178, 2181, 2185, 2186, AND 2188** is being served electronically on February 13, 2024, to the e-mail addresses shown below:

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