IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

INPRIA CORPORATION **Plaintiff,** **v.** **LAM RESEARCH CORP.,** **Defendants.**	Case No. 1-22-cv-01359-CJB

DEFENDANT'S INITIAL INVALIDITY CONTENTIONS

Pursuant to the Scheduling Order (D.I. 59) and the Stipulation and Order Modifying Deadlines (D.I. 98), Defendant Lam Research Corp. ("Lam" or "Defendant"), by and through its undersigned counsel, respectfully submits these Initial Invalidity Contentions and an accompanying document production with respect to the claims identified by Plaintiff Inpria Corporation ("Inpria" or "Plaintiff") in their Disclosure of Asserted Claims and Infringement Contentions ("Infringement Contentions").

The Asserted Claims, as reflected in Inpria's Initial Infringement Contentions, are claims 1-17, 19-26 of U.S. Patent No. 9,310,684 (the "'684 Patent"), claims 1-3, 5-7, 9, 12 of U.S. Patent No. 9,823,564 (the "'564 Patent"), claims 11-16, 18-21 of U.S. Patent No. 10,642,153 (the "'153 Patent"), claims 1-4, 6-12, 14-19, 22, 23 of U.S. Patent No. 10,732,505 (the "'505 Patent"), claims 1-10, 14-20 of U.S. Patent No. 11,537,048 (the "'048 Patent"), claims 1-29 of U.S. Patent No. 11,809,081 (the "'081 Patent"), claims 1-4, 6-9 of U.S. Patent No. 11,673,903 (the "'903 Patent"), and claims 1-5, 10-16, 18, 19 of U.S. Patent No. 11,693,312 (the "'312 Patent") (collectively the "Asserted Inpria Patents").

INPRIA EXHIBIT 2003
Entegris, Inc. v. Inpria Corp.
IPR2025-00267

I. PRELIMINARY STATEMENT

Pursuant to the Scheduling Order (D.I. 59), these invalidity contentions are preliminary in nature and do not address claim construction or noninfringement. Defendant reserves all rights with respect to such issues, including their position that claims of the Asserted Patents should be construed in a particular manner and/or are not infringed. These invalidity contentions are based on Defendant's current knowledge, understanding, and belief of the Asserted Patents and prior art, of Plaintiff's infringement theories (as disclosed in their Initial Infringement Contentions), and of the facts and other information available as of the date of these initial invalidity contentions. Defendant's investigation, discovery, and analysis of information related to this action are ongoing. Additional discovery and/or orders of the Court may require Defendant to amend or supplement these invalidity contentions, and Defendant expressly reserves the right to do so as the case proceeds. These contentions represent Defendant's good-faith effort to provide a comprehensive identification of prior art relevant to this case, but Defendant reserves the right to modify or supplement their prior art list and invalidity contentions at a later time with, or based upon, pertinent information that may be subsequently discovered.

A. No Waiver.

Nothing in these invalidity contentions is intended, nor should be construed, as a waiver of any claim construction argument, noninfringement position, or argument under 35 U.S.C. § 112. Defendant's statements herein (including the accompanying claim charts) reflect Defendant's present understanding of the purported scope of the claims as alleged by Plaintiff in their Infringement Contentions. For the avoidance of doubt, these contentions are not intended to present or argue in favor of any construction of the Asserted Claims, and Defendant expressly reserves the right to present constructions that differ from any construction that may be alleged to

underlie these contentions. The Court established a deadline for the parties' proposed claim constructions, and Defendant will disclose their proposed constructions accordingly. These invalidity contentions do not constitute an acquiescence to Plaintiff's interpretation of any claims to the extent they depart from the plain meaning of the Asserted Claims and from the proper scope of the claims as may be subsequently construed by the Court. Defendant disagrees with Plaintiff's positions as to the purported scope of the Asserted Claims to the extent they seek to expand the scope of the Asserted Claims beyond their proper construction.

The Asserted Claims have not yet been construed by the Court in this case and, thus, Defendant has not yet had the opportunity to compare the Asserted Claims of the Asserted Patents (as construed by the Court) with the prior art. Defendant reserves the right to amend, supplement, or materially modify their invalidity contentions after the claims have been construed by the Court in this case. Defendant also reserves the right to amend, supplement, or materially modify their invalidity contentions in response to any claim construction positions that Plaintiff may take. Defendant also reserves the right to assert that a claim is indefinite, not enabled, or fails to meet the written description requirement of 35 U.S.C. § 112 based on any claim construction position Plaintiff may take in this case or based on any claim construction the Court may adopt in this case.

B. No Admission.

Nothing disclosed herein is an admission or acknowledgement that any product accused of infringement by Plaintiff in their Infringement Contentions (the "Accused Products"), or any of Defendant's other products or services, infringes any of the Asserted Claims.

Defendant further notes that Plaintiff appears to rely upon overly broad constructions of the Asserted Claims. At the same time, Plaintiff's Initial Infringement Contentions are in most places too general and vague to discern Plaintiff's infringement theories and how exactly Plaintiff

contends each Accused Product meets or practices each element of the Asserted Claims. As a result, Defendant has been prejudiced in their ability to prepare these invalidity contentions. In addition, Plaintiff's Infringement Contentions, in many cases, fail to put Defendant on notice of Plaintiff's interpretation of the Asserted Claims, further prejudicing Defendant's ability to identify relevant prior art. To the extent that Plaintiff is later permitted by the Court to amend their contentions to cure the deficiencies of their current contentions, Defendant expressly reserves the right to supplement or amend these initial invalidity contentions to account for such amendments.

To the extent that any of the prior art references disclose the same functionality or feature of any of the Accused Products, Defendant reserves the right to argue that said feature or functionality does not practice any element of any of the Asserted Claims, and to argue, in the alternative, that if said feature or functionality is found to practice any element of any of the Asserted Claims, then the prior art reference demonstrates that the element is not novel, is obvious, and/or is otherwise not patentable.

Attached hereto are representative claim charts that demonstrate how the Asserted Claims of the Asserted Patent are invalid in view of certain prior art. The references cited in the attached claim charts disclose the limitations of the Asserted Claims expressly and/or inherently. The suggested obviousness combinations may be presented in conjunction with, or in the alternative to, Defendant's contentions regarding anticipation. These obviousness combinations should not be construed to suggest that any reference included in any combination is not anticipatory in their own right.

C. Reservation of Rights.

Prior art not included in this disclosure may become relevant. For example, additional prior art may be relevant to the extent that Plaintiff contends, or discovery reveals, that the Asserted

Patents are entitled to a different priority date than those facially determinable from the face of the patents. Plaintiff's Supplemental Response to Defendant's Interrogatory No. 2 indicates that Plaintiff is "investigat[ing] the factual circumstances of the conception and reduction to practice of the inventions in all Asserted Claims, including the earliest available priority date for U.S. Patent Nos. 9,823,564 and 11,693,312." Therefore, Defendant reserves the right to identify, produce, and compare additional prior art to the Asserted Patents to the extent different priority dates are revealed during the course of discovery. If the named inventors of the Asserted Patents are found to be incorrect (e.g., based on developments and decisions in the *The Research Foundation for the State of New York v. Inpria Corp. and JSR Corp.*, C.A. No. 1:24-cv-00120-MAD-ML (N.D.N.Y) ("*SUNY*") case), such that any critical dates of the Asserted Patents are affected, Defendant reserves the right to amend or supplement these initial invalidity contentions pursuant to the corrected critical dates.

Defendant is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the prior art identified by Defendant. Defendant reserves the right to identify other references that would have made the addition of the allegedly missing limitation to the disclosed device or method obvious or show that the allegedly missing limitation would have been known or readily apparent to one of ordinary skill in the art at the time of the invention in light of the disclosure of the prior art at issue.

The accompanying claim charts include citations to prior art references that are exemplary and not exclusive. Defendant reserves the right to rely on uncited portions of the prior art references and on other publications and expert testimony that aids in understanding and interpreting the cited portions, that provides context for them, and as additional evidence that the prior art discloses a claimed feature.

Defendant provides these invalidity contentions only for the claims asserted by Plaintiff but reserve the right to seek invalidation of all claims in the Asserted Patents.

D. Ongoing Investigation.

Defendant's investigation is ongoing, and pursuant to the Scheduling Order (D.I. 59), Defendant reserves the right to amend its disclosures and document production to account for evidence uncovered as its investigation continues, including in its Final Invalidity Contentions. Such amendments include identifying and relying on additional references, products, sales, or offers for sale that may result from Defendant's further search and analysis. Defendant reserves the right to supplement these contentions in light of any additional prior art of which Plaintiff is aware and did not disclose to Defendant in discovery, or that might be subsequently disclosed by Plaintiff in response to Defendant's discovery requests. Defendant has or anticipates issuing subpoenas to third parties believed to have knowledge, documentation and/or corroborating evidence concerning some of the prior art listed herein and/or additional prior art. These third parties include, but are not limited to, the authors, employers of authors, inventors, assignees, or former or current employees of assignees, of the references and systems identified in these initial invalidity contentions. Defendant reserves the right to supplement these contentions in light of any newly discovered information produced by third-party companies from which Defendant may seek discovery.

II. STATE OF THE ART

Defendant sets forth a summary of their current understanding of the state of the art for the general subject matter of the Asserted Patents. Defendant expressly reserves the right to rely on each of the prior art references disclosed below and in Exhibits 1-20. Defendant also reserves the right to rely on the discussions of the state of the art and prior art for the Asserted Patents and their

respective file histories, including any prior art cited in the file histories, in explaining the state of the art and the ways that each respective reference corresponds with the Asserted Claims. Defendant further expressly reserves the right to supplement its summary of the state of the art, including for example, by information from any of the authors, named inventors, or assignees of any of the prior art references, by personnel familiar with systems based on any of the prior art, or by technical experts retained on behalf of any party.

III. THE '505 PATENT IS INVALID

A. The '505 Patent Priority Date

The earliest claimed priority date of the '505 Patent is October 13, 2015. Plaintiff has provided no evidence to support an earlier priority date. To the extent Plaintiff alleges that any prior art relied on in these invalidity contentions does not qualify as prior art to the Asserted Patent, Defendant reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Defendant contends that the prior art references described and charted in Exhibits 1-3 anticipate and/or render obvious, one or more of the Asserted Claims of the '505 Patent.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional disclosures or support for a particular claim element. Each and every disclosure of the same limitation in the same reference is not necessarily identified. In addition, persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature and in the context of their knowledge as persons of ordinary skill in the art. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, other evidence, or that within the

knowledge of a person of ordinary skill in the art, such as, for example, a motivation to combine, such persons of ordinary skill in the art would rely on other information within the reference, along with other publications and their general scientific knowledge and experience in the field. Thus, each prior art reference identified herein should be understood in the context of the reference itself in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors or an expert testifying as to the knowledge of a person of ordinary skill in the art. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Defendant may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

Lam provides below exemplary references that anticipate and/or render obvious the Asserted Claims of the ’505 Patent.

- Cardineau, Brian, et al. “Photolithographic properties of tin-oxo clusters using extreme ultraviolet light (13.5 nm).” Microelectronic engineering 127 (2014): 44-50 (“Cardineau Paper”)
- Cardineau, Brian. Novel Resist Systems for EUV Lithography: LER, Chain-Scission, Nanoparticle and MORE. State University of New York at Albany, 2013 (“Cardineau Dissertation”)
- Van Mol, A. M. B., et al. “Chemical vapor deposition of tin oxide: Fundamentals and applications.” Thin Solid Films 502.1-2 (2006): 72-78 (“Van Mol 2006”)
- Van Mol, A. M. B., et al. “Chemical vapour deposition of tin oxide thin films.” (2003). [Phd Thesis 1 (Research TU/e / Graduation TU/e), Chemical Engineering and Chemistry]. Technische Universiteit Eindhoven. https://doi.org/10.6100/IR569472 (“Van Mol 2003”)

- Banse, Frederic, et al. “Hydrolysis of monobutyltin trialkoxides: Synthesis and characterizations of $\{(BuSn)_{12}O_{14}(OH)_6\}(OH)_2$.” Inorganic Chemistry 34.25 (1995): 6371-6379 (“Banse”)

- Jaumier, Pascale, et al. “New route to monoorganotin oxides and alkoxides from trialkynylorganotins.” Chemical Communications 3 (1998): 369-370 (“Jaumier”).

- Molloy, Kieran C. “Precursors for the formation of tin (IV) oxide and related materials.” Journal of Chemical Research 2008.10 (2008): 549-554 (“Molloy”)

- De Stefano, Concetta, et al. "Hydrolysis processes of organotin (IV) compounds in sea water." Chemical processes in marine environments. Berlin, Heidelberg: Springer Berlin Heidelberg, 2000. 213-228 (“De Stefano”)

- Blunden, S. J., R. Hill, and S. E. Sutton. "A thermal analytical study of some mono-and di-organotin oxides and carboxylates." Applied organometallic chemistry 5.3 (1991): 159-165 (“Blunden”)

- Valla, Vasiliki, and Maria Bakola-Christianopoulou. "Chemical Aspects of Organotin Derivatives of Beta-diketones, Quinonoids, Steroids and Some Currently Used Drugs: A Review of the Literature with Emphasis on the Medicinal Potential of Organotins." Synthesis and Reactivity in Inorganic, Metal-Organic and Nano-Metal Chemistry 37.7 (2007): 507-525 (“Valla”)

- U.S. Patent Publication No. 2012/0088369 (“Weidman ’369”)

- U.S. Patent Publication No. 2012/0088193 (“Weidman ’193”)

- U.S. Patent Publication No. 2012/0207927 (“Dussarrat ’927”)

- U.S. Patent Publication No. 2011/0183527 (“Cho ’527”)

- U.S. Patent Publication No. 2011/0293888 (“Stowers ’888”)

The prior art identified above, and in the attached ’505 charts, can properly be combined in multiple ways to demonstrate the obviousness of the Asserted Claims of the ’505 Patent. Specifically, each Asserted Claim of the ’505 Patent is anticipated and/or rendered obvious by Cardineau Paper, Cardineau Dissertation, Van Mol 2006, Van Mol 2003, Banse, Jaumier, Molloy, Blunden, De Stefano, Blunden, Valla, Cho ’527, Dussarrat ’927, Weidman ’369, Weidman ’193, Stowers ’888, alone or in combination.

The references disclosed in the attached chart and herein are also directed to the same or similar features as the purported invention claimed in the Asserted Claims of the ’505 Patent. To the extent Inpria contends that any of these features solved a problem in the art, the references cited herein show that that problem was known to those of ordinary skill and had already been solved using obvious solutions.

To that end, the Asserted Claims of the ’505 Patent simply combine elements already combined and well known in the art and yield no more than what one skilled in the art would have expected from such a combination. For example, with respect to the ’505 Patent, when confronted with the alleged problems described in the ’505 Patent, one of ordinary skill in the art at the time of the alleged inventions would have been motivated to consider the materials, devices, and/or techniques taught by the prior art cited in these Initial Invalidity Contentions. Consideration of the teachings of this prior art, both individually and in combination, would necessarily lead to the alleged invention claimed in the ’505 Patent. This is demonstrated by the cited prior art, which disclose all of the elements of the Asserted Claims of the ’505 Patent, as well as motivations to modify or combine their individual teachings. One of skill in the art would have been motivated to either modify the prior art identified in the claim charts or to combine that prior art in the manner indicated, by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces.

Additionally, Lam hereby incorporates by reference the motivations to combine references set forth during the prosecution of the Asserted Claims of the ’505 Patent, including the statements and reasoning set forth by the examiner, as to why it would have been obvious to modify or combine references to achieve the limitations of the Asserted Claims of the ’505 Patent.

C. Invalidity for Lack of Written Description and/or Enablement

The Asserted Claims of the ’505 Patent are invalid for failing to satisfy the written description and enablement requirements under 35 U.S.C. § 112. For example, Asserted Claim 1 is broadly directed to a vapor deposition method for forming a radiation patternable film comprising an oxo-hydroxo network comprising inputting a precursor represented by the formula $RnSnX_{4-n}$ in a deposition chamber along with an oxygen-containing precursor. But the specification of the ’505 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the claimed vapor deposition method, not to mention, one using the full scope of compounds represented by the formula $R_nS_nX_{4-n}$.

As recited in claim 1, R in formula $R_nS_nX_{4-n}$ can be any organic ligand with 1-31 carbon atoms bound to Sn and X can be any ligand having a hydrolysable bond with Sn. This represents an incredibly broad genus of compounds, potentially encompassing thousands if not hundreds of thousands of different compounds. The specification, however, does not contain a single working example of a vapor deposition method comprising inputting a precursor represented by the formula $RnSnX_{4-n}$ in a deposition chamber along with an oxygen-containing precursor. *Idenix Pharmaceuticals LLC v. Gilead Sciences Inc.*, 941 F.3d 1149, 1164 (Fed. Cir. 2019) (“relatively few representative examples” do not suffice where, as here, “tens or hundreds of thousands of possible” structural candidates exist). As such, a person of skill in the art, reading the ’505 Patent’s disclosure would not conclude that the inventors were in possession of the method claimed.

The ’505 Patent’s disclosure is likewise insufficient to inform those skilled in the art how to both make and use the full scope of the claimed invention without undue experimentation. The specification of the ’505 Patent does not provide meaningful guidance or working examples that would permit one of skill to avoid excessive and undue experimentation. Although the specification discloses generic guidance on vapor deposition, such generic disclosure is

insufficient to inform those skilled in the art how to practice the claimed vapor deposition method, not to mention, one using the full scope of compounds represented by the formula $R_nS_nX_{4-n}$. Moreover, the specification provides no guidance as to what "conditions in the deposition chamber [allow the formation of] a composition with non-volatile components and a volatile component comprising a reaction product with X ligand or ligands" as recited in claim 1. It is not enough for the patent to merely provide a "starting point" from which one of skill in the art must "engage in an iterative, trial-and-error process to practice the claimed invention….." *Wyeth v. Abbott Labs.*, 720 F.3d 1380, 1386 (Fed. Cir. 2013). As such, a person of skill in the art, reading the '505 Patent's disclosure would not be able to both make and use the full scope of the claimed invention without undue experimentation.[1]

D. Indefiniteness

Defendant identifies the following claim terms as being indefinite. Defendant notes that its investigation into terms for construction and the parties exchange of terms for construction may affect these indefiniteness contentions (*e.g.*, resolve these issues and/or highlight additional definiteness issues). As such, Defendant reserves the right to modify and/or supplement its contentions, including through claim construction disclosures, as it deems appropriate.

Term	Description of Contention
"metal cations" *'505 Patent, cl. 1.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because it is unclear whether or not the metal must have a positive charge.

[1] The specification of the '505 Patent also does not provide meaningful guidance or description as to the meaning of "[having] a temperature from about 40° C. to about 175° C" i.e., it is unclear whether the claimed temperature refers to the temperature of reactant streams, showerhead, pedestal, chamber walls.

Term	Description of Contention
"alkylamido or dialkylamido (—NR^1R^2, where R^1 and R^2 are independently hydrocarbon groups with 1-10 carbon atoms or hydrogen)" *'505 Patent, cl. 15.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because "—NR^1R^2, where R^1 and R^2 are independently hydrocarbon groups with 1-10 carbon atoms or hydrogen" is broader than "alkylamide or dialkylamido."

IV. THE '048 PATENT IS INVALID

A. The '048 Patent Priority Date

The earliest claimed priority date of the '048 Patent is October 13, 2015. Plaintiff has provided no evidence to support an earlier priority date. To the extent Plaintiff alleges that any prior art relied on in these invalidity contentions does not qualify as prior art to the Asserted Patent, Defendant reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Defendant contends that the prior art references described and charted in Exhibits 4 and 5 anticipate and/or render obvious, one or more of the Asserted Claims of the '048 Patent.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional disclosures or support for a particular claim element. Each and every disclosure of the same limitation in the same reference is not necessarily identified. In addition, persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature and in the context of their knowledge as persons of ordinary skill in the art. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, other evidence, or that within the

knowledge of a person of ordinary skill in the art such as, for example, a motivation to combine, such persons of ordinary skill in the art would rely on other information within the reference, along with other publications and their general scientific knowledge and experience in the field. Thus, each prior art reference identified herein should be understood in the context of the reference itself in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors or an expert testifying as to the knowledge of a person of ordinary skill in the art. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Defendant may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

Lam provides below exemplary references that anticipate and/or render obvious the Asserted Claims of the ’048 Patent.

- Banse, Frederic, et al. “Hydrolysis of monobutyltin trialkoxides: Synthesis and characterizations of $\{(BuSn)_{12}O_{14}(OH)_6\}(OH)_2$.” Inorganic Chemistry 34.25 (1995): 6371-6379 (“Banse”)
- Blanksby, Stephen J., and Ellison, G. Barney. "Bond dissociation energies of organic molecules." Accounts of chemical research 36.4 (2003): 255-263 (“Blanksby”)
- Blunden, S. J., R. Hill, and S. E. Sutton. "A thermal analytical study of some mono-and di-organotin oxides and carboxylates." Applied organometallic chemistry 5.3 (1991): 159-165 (“Blunden”)
- Cardineau, Brian, et al. “Photolithographic properties of tin-oxo clusters using extreme ultraviolet light (13.5 nm).” Microelectronic engineering 127 (2014): 44-50 (“Cardineau Paper”)

- De Stefano, Concetta, et al. "Hydrolysis processes of organotin (IV) compounds in sea water." Chemical processes in marine environments. Berlin, Heidelberg: Springer Berlin Heidelberg, 2000. 213-228 ("De Stefano")
- Jaumier, et al., "New Route to Monoorganotin Oxides and Alkoxides from Trialkynylorganotins," Chem. Commun. 1998(3):369 (1998) ("Jaumier") Molloy, Kieran C. "Precursors for the formation of tin (IV) oxide and related materials." Journal of Chemical Research 2008.10 (2008): 549-554 ("Molloy")
- Maeng, W. J., Sang-Joon Park, and H. Kim. "Atomic layer deposition of Ta-based thin films: Reactions of alkylamide precursor with various reactants." Journal of Vacuum Science & Technology B: Microelectronics and Nanometer Structures Processing, Measurement, and Phenomena 24.5 (2006): 2276-2281 ("Maeng") \
- Molloy, Kieran C. "Precursors for the formation of tin (IV) oxide and related materials." Journal of Chemical Research 2008.10 (2008): 549-554 ("Molloy")
- U.S. Patent No. 9,328,416 (Lam '416)
- U.S. Patent Publication No. 2011/0183527 ("Cho '527")
- U.S. Patent Publication No. 2012/0088193 ("Weidman '193")
- U.S. Patent Publication No. 2012/0088369 ("Weidman '369")
- U.S. Patent Publication No. 2012/0207927 ("Dussarrat '927")
- U.S. Patent Publication No. 2013/0113085 ("Michaelson '085")
- Valla, Vasiliki, and Maria Bakola-Christianopoulou. "Chemical Aspects of Organotin Derivatives of Beta-diketones, Quinonoids, Steroids and Some Currently Used Drugs: A Review of the Literature with Emphasis on the Medicinal Potential of Organotins." Synthesis and Reactivity in Inorganic, Metal-Organic and Nano-Metal Chemistry 37.7 (2007): 507-525 ("Valla")
- Van Mol, A. M. B., et al. "Chemical vapor deposition of tin oxide: Fundamentals and applications." Thin Solid Films 502.1-2 (2006): 72-78 ("Van Mol 2006")
- Van Mol, A. M. B., et al. "Chemical vapour deposition of tin oxide thin films." (2003). [Phd Thesis 1 (Research TU/e / Graduation TU/e), Chemical Engineering and Chemistry]. Technische Universiteit Eindhoven. https://doi.org/10.6100/IR569472 ("Van Mol 2003")

The prior art identified above, and in the attached '048 charts, can properly be combined in multiple ways to demonstrate the obviousness of the Asserted Claims of the '048 Patent. Specifically, each Asserted Claim of the '048 Patent is rendered obvious by Lam '416, Cardineau Paper, Van Mol 2006, Van Mol 2003, Banse, Jaumier, Molloy, Maeng, Blunden, De Stefano, Valla, Weidman '369, Weidman '193, Cho '527, Stowers '888, Maeng, Blanksby, Dussarrat '927, alone or in combination.

The references disclosed in the attached chart and herein are also directed to the same or similar features as the purported invention claimed in the Asserted Claims of the '048 Patent. To

the extent Inpria contends that any of these features solved a problem in the art, the references cited herein show that that problem was known to those of ordinary skill and had already been solved using obvious solutions.

To that end, the Asserted Claims of the ’048 Patent simply combine elements already combined and well known in the art and yield no more than what one skilled in the art would have expected from such a combination. For example, with respect to the ’048 Patent, when confronted with the alleged problems described in the ’048 Patent, one of ordinary skill in the art at the time of the alleged inventions would have been motivated to consider the techniques taught by the prior art cited in these Initial Invalidity Contentions. Consideration of the teachings of this prior art, both individually and in combination, would necessarily lead to the alleged invention claimed in the ’048 patent. This is demonstrated by the cited prior art, which disclose all of the elements of the Asserted Claims of the ’048 Patent, as well as motivations to modify or combine their individual teachings. One of skill in the art would have been motivated to either modify the prior art identified in the claim charts or to combine that prior art in the manner indicated, by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces.

Additionally, Lam hereby incorporates by reference the motivations to combine references set forth during the prosecution of the Asserted Claims of the ’048 Patent, including the statements and reasoning set forth by the examiner, as to why it would have been obvious to modify or combine references to achieve the limitations of the Asserted Claims of the ’048 Patent.

C. Invalidity for Lack of Written Description and/or Enablement

The Asserted Claims of the ’048 Patent are invalid for failing to satisfy the written description and enablement requirements under 35 U.S.C. § 112. For example, Asserted Claim 1 is broadly directed to a system comprising a deposition chamber, a substrate within the interior of

the deposition chamber, an inlet into the deposition chamber, a structure configured to deliver flow from a supply of an inert gas, a supply of an organotin composition comprising a compound described by the formula $RSnX_3$, a structure configured to deliver flow of a first precursor vapor from the supply of the organotin compound, and a structure to deliver a second precursor vapor comprising water, hydrogen peroxide or a combination thereof. But the specification of the '048 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the claimed system, not to mention, one using the full scope of compounds represented by the formula $RSnX_3$.

As recited in claim 1, R in formula $RSnX_3$ can be any organic ligand with 1-31 carbon atoms bound to Sn with a metal-carbon bond. This represents an incredibly broad genus of compounds, potentially encompassing thousands if not hundreds of thousands of different compounds. The specification, however, does not contain a single working example of a system comprising formula $RSnX_3$ as claimed. *Idenix*, 941 F.3d at 1164 ("relatively few representative examples" do not suffice where, as here, "tens or hundreds of thousands of possible" structural candidates exist). As such, a person of skill in the art, reading the '048 Patent's disclosure would not conclude that the inventors were in possession of the system claimed.

The '048 Patent's disclosure is likewise insufficient to inform those skilled in the art how to both make and use the full scope of the claimed invention without undue experimentation. The specification of the '048 Patent does not provide meaningful guidance or working examples that would permit one of skill to avoid excessive and undue experimentation. Although the specification discloses generic guidance on vapor deposition, such generic disclosure is insufficient to inform those skilled in the art how to practice the claimed system, not to mention, one using the full scope of compounds as claimed. It is not enough for the patent to merely provide

a "starting point" from which one of skill in the art must "engage in an iterative, trial-and-error process to practice the claimed invention . . . ." *Wyeth v. Abbott Labs.*, 720 F.3d 1380, 1386 (Fed. Cir. 2013). As such, a person of skill in the art, reading the '048 Patent's disclosure would not be able to both make and use the full scope of the claimed invention without undue experimentation.

D. Indefiniteness

Defendant identifies the following claim terms as being indefinite. Defendant notes that its investigation into terms for construction and the parties exchange of terms for construction may affect these indefiniteness contentions (*e.g.*, resolve these issues and/or highlight additional definiteness issues). As such, Defendant reserves the right to modify and/or supplement its contentions, including through claim construction disclosures, as it deems appropriate.

Term	Description of Contention
"the formula $RSnX_3$, where R is an organic ligand with 1-31 carbon atoms" *'048 Patent, cl. 1.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because it is unclear if the organic ligand only includes 1-31 carbon atoms, or if the organic ligand may include other atoms but must include 1-31 carbon atoms.
"alkylamido or dialkylamido (—NR^1R^2, where R^1 and R^2 are independently hydrocarbon groups with 1-10 carbon atoms or hydrogen)" *'048 Patent, cl. 1.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because "—NR^1R^2, where R^1 and R^2 are independently hydrocarbon groups with 1-10 carbon atoms or hydrogen" is broader than "alkylamide or dialkylamido."

In addition, the limitation in claim reciting "wherein the substrate is maintained at a temperature of less than 200° C" renders claim 1 is indefinite because it affirmatively recites user input, i.e., **maintaining the temperature below 200° C**. *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005). A person of ordinary skill in the art would not understand whether the claims are infringed by a system capable of maintaining the substrate at a

temperature of less than 200° C or when a person actually uses the claimed system **and maintains** the substrate at a temperature of less than 200° C. *Courtesy Prod., L.L.C. v. Hamilton Beach Brands, Inc.*, No. CV 13-2012-SLR, 2015 WL 7295436, at *5 (D. Del. Nov. 18, 2015) ("a person of ordinary skill in the art would not understand whether the claims at bar are infringed by an apparatus capable of heating water and having brew baskets inserted or when a person actually uses the beverage brewing system to heat water and inserts a brew basket.").[2]

V. THE '081 PATENT IS INVALID

A. The '081 Patent Priority Date

The earliest claimed priority date of the '081 Patent is October 13, 2015. Plaintiff has provided no evidence to support an earlier priority date. To the extent Plaintiff alleges that any prior art relied on in these invalidity contentions does not qualify as prior art to the Asserted Patent, Defendant reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Defendant contends that the prior art references described and charted in Exhibit 6 anticipate and/or render obvious, one or more of the Asserted Claims of the '081 Patent.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional disclosures or support for a particular claim element. Each and every disclosure of the same limitation in the same reference is not necessarily identified. In addition, persons of ordinary skill in the art generally read a prior art

[2] The specification of the '048 Patent also does not provide meaningful guidance or description as to the meaning of "[having] a temperature from about 40° C. to about 175° C" or "[having] a temperature from about 40° C. to about 200° C" i.e., it is unclear whether the claimed temperature refers to the temperature of reactant streams, showerhead, pedestal, chamber walls.

reference as a whole and in the context of other publications and literature and in the context of their knowledge as persons of ordinary skill in the art. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, other evidence, or that within the knowledge of a person of ordinary skill in the art such as, for example, a motivation to combine, such persons of ordinary skill in the art would rely on other information within the reference, along with other publications and their general scientific knowledge and experience in the field. Thus, each prior art reference identified herein should be understood in the context of the reference itself in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors or an expert testifying as to the knowledge of a person of ordinary skill in the art. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Defendant may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

Lam provides below exemplary references that anticipate and/or render obvious the Asserted Claims of the ’081 Patent.

- Cardineau, Brian, et al. “Photolithographic properties of tin-oxo clusters using extreme ultraviolet light (13.5 nm).” Microelectronic engineering 127 (2014): 44-50 (“Cardineau Paper”)
- Cardineau, Brian, “Novel Resist Systems for EUV Lithography: LER, Nanoparticle, Chain-Scission and MORE” (Ph.D. Dissertation, State University of New York) (“Cardineau Dissertation”)

- Van Mol, A. M. B., et al. "Chemical vapor deposition of tin oxide: Fundamentals and applications." Thin Solid Films 502.1-2 (2006): 72-78 ("Van Mol 2006")
- Van Mol, A. M. B., et al. "Chemical vapour deposition of tin oxide thin films." (2003). [Phd Thesis 1 (Research TU/e / Graduation TU/e), Chemical Engineering and Chemistry]. Technische Universiteit Eindhoven. https://doi.org/10.6100/IR569472 ("Van Mol 2003")
- Banse, Frederic, et al. "Hydrolysis of monobutyltin trialkoxides: Synthesis and characterizations of $\{(BuSn)_{12}O_{14}(OH)_6\}(OH)_2$." Inorganic Chemistry 34.25 (1995): 6371-6379 ("Banse")
- Jaumier, et al., "New Route to Monoorganotin Oxides and Alkoxides from Trialkynylorganotins," Chem. Commun. 1998(3):369 (1998) ("Jaumier")
- Molloy, Kieran C. "Precursors for the formation of tin (IV) oxide and related materials." Journal of Chemical Research 2008.10 (2008): 549-554 ("Molloy")
- Blanksby, Stephen J., and G. Barney Ellison. "Bond dissociation energies of organic molecules." Accounts of chemical research 36.4 (2003): 255-263 ("Blanksby")
- U.S. Patent Publication No. 2011/0183527 ("Cho '527")
- U.S. Patent Publication No. 2012/0088369 ("Weidman '369")
- U.S. Patent Publication No. 2012/0088193 ("Weidman '193")
- U.S. 2011/0293888 ("Stowers '888")
- U.S. Patent No. 5,698,262 ("Soubeyrand '262")

The prior art identified above, and in the attached '081 chart, can properly be combined in multiple ways to demonstrate the obviousness of the Asserted Claims of the '081 Patent. Specifically, each Asserted Claim of the '081 Patent is rendered obvious by Cardineau Paper, Cardineau Dissertation, Banse, Jaumier, Molloy, Van Mol 2003, Van Mol 2006, Blanksby, Cho '527, Weidman '369, Weidman '193, Stowers '888, Soubeyrand '262, alone or in combination.

The references disclosed in the attached chart and herein are also directed to the same or similar features as the purported invention claimed in the Asserted Claims of the '081 Patent. To the extent Inpria contends that any of these features solved a problem in the art, the references cited herein show that that problem was known to those of ordinary skill and had already been solved using obvious solutions.

To that end, the Asserted Claims of the '081 Patent simply combine elements already combined and well known in the art and yield no more than what one skilled in the art would have expected from such a combination. For example, with respect to the '081 Patent, when confronted

with the alleged problems described in the ’081 Patent, one of ordinary skill in the art at the time of the alleged inventions would have been motivated to consider the techniques taught by the prior art cited in these Initial Invalidity Contentions. Consideration of the teachings of this prior art, both individually and in combination, would necessarily lead to the alleged invention claimed in the ’081 patent. This is demonstrated by the cited prior art, which disclose all of the elements of the Asserted Claims of the ’081 Patent, as well as motivations to modify or combine their individual teachings. One of skill in the art would have been motivated to either modify the prior art identified in the claim charts or to combine that prior art in the manner indicated, by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces.

Additionally, Lam hereby incorporates by reference the motivations to combine references set forth during the prosecution of the Asserted Claims of the ’081 Patent, including the statements and reasoning set forth by the examiner, as to why it would have been obvious to modify or combine references to achieve the limitations of the Asserted Claims of the ’081 patent.

C. Invalidity for Lack of Written Description and/or Enablement

The Asserted Claims of the ’081 Patent are invalid for failing to satisfy the written description and enablement requirements under 35 U.S.C. § 112. For example, Asserted Claim 1 is broadly directed to a vapor deposition method for forming a radiation patternable film comprising depositing a tin composition having organic ligands and hydrolysable ligands, wherein the organic ligands comprise radiation sensitive Sn—C bonds. But the specification of the ’081 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the claimed vapor deposition method, not to mention, one using the full scope of compounds as claimed.

As recited in claim 1, the tin composition can have any organic ligand comprising radiation sensitive Sn—C bonds. It can also have any hydrolysable ligands. This represents an incredibly broad genus of compounds, potentially encompassing thousands if not hundreds of thousands of different compounds. The specification, however, does not contain a single working example of a vapor deposition method comprising depositing a composition as claimed. *Idenix*, 941 F.3d at 1164 ("relatively few representative examples" do not suffice where, as here, "tens or hundreds of thousands of possible" structural candidates exist). As such, a person of skill in the art, reading the '081 Patent's disclosure would not conclude that the inventors were in possession of the method claimed.

The '081 Patent's disclosure is likewise insufficient to inform those skilled in the art how to both make and use the full scope of the claimed invention without undue experimentation. The specification of the '081 Patent does not provide meaningful guidance or working examples that would permit one of skill to avoid excessive and undue experimentation. Although the specification discloses generic guidance on vapor deposition, such generic disclosure is insufficient to inform those skilled in the art how to practice the claimed vapor deposition method, not to mention, one using the full scope of compounds as claimed. Moreover, while the specification discloses generic guidance to identify hydrolysable ligands, such generic disclosure is insufficient to inform those skilled in the art whether all ligands within full scope of compounds as claimed are in fact hydrolysable ligands. It is not enough for the patent to merely provide a "starting point" from which one of skill in the art must "engage in an iterative, trial-and-error process to practice the claimed invention . . . ." *Wyeth v. Abbott Labs.*, 720 F.3d 1380, 1386 (Fed. Cir. 2013). As such, a person of skill in the art, reading the '081 Patent's disclosure would not be able to both make and use the full scope of the claimed invention without undue experimentation.

Moreover, the specification of the '081 Patent does not provide sufficient description or enablement of effective patterning using EUV doses at the entire range of "3 mJ/cm^2 to 150 mJ/cm^2" using vapor deposition. Instead, one of ordinary skill in the art would have to make and test all films within the claimed genus and at the entire range of EUV doses of "3 mJ/cm^2 to 150 mJ/cm^2" to identify those that can be effectively patterned. As such, a person of skill in the art, reading the '564 Patent's disclosure would not be able to both make and use the full scope of the claimed invention without undue experimentation.

D. Indefiniteness

Defendant identifies the following claim terms as being indefinite. Defendant notes that its investigation into terms for construction and the parties exchange of terms for construction may affect these indefiniteness contentions (*e.g.*, resolve these issues and/or highlight additional definiteness issues). As such, Defendant reserves the right to modify and/or supplement its contentions, including through claim construction disclosures, as it deems appropriate.

Term	Description of Contention
"a tin composition having organic ligands and hydrolysable ligands" *'081 Patent, cls. 1, 27.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because the metes and bounds of the structure of the tin composition is unclear.
"an alkyl ligand, a branched alkyl ligand" *'081 Patent, cl. 8.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because "a branched alkyl ligand" is a species of "an alkyl ligand."
"with different organic ligands" *'081 Patent, cl. 12.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because it is unclear whether preceding portion of the claim it is modifying.
"wherein the hydrolysable ligands comprise a halide, an alkoxide, an alkylamide, an alkylnide, an azide, a dialkylamide, a siloxide, a silylamide, disilylamide, an aryloxide, an amidato, an amidinato,	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because the metes and bounds of the structure of the hydrolysable ligands is unclear.

an imido, fluorinated analogues thereof, or a mixture thereof" *'081 Patent, cls. 12, 27.*	

VI. THE '564 PATENT IS INVALID

A. The '564 Patent Priority Date

The '564 Patent issued from a continuation application 14/858,612 ("'612 application"), filed September 18, 2015, and purports to claim priority to application 12/850,867 ("'867 application"), filed August 4, 2010. The first utility application in the priority chain, the '867 application, published on December 1, 2011, as U.S. Patent Publication No. 2011/0293888 ("Stowers '888"). As explained in Lam's Petition for *Inter Partes* Review, IPR2024-00033, incorporated fully herewith, the Asserted Claims of the '564 Patent are not entitled to an effective filing date earlier than September 18, 2015, when the '612 application was filed. Defendants have also assessed the invalidity of the '564 Patent as of the date of its earliest priority.

B. Identification of Prior Art

Defendant contends that the prior art references described and charted in Exhibits 7-10 anticipate and/or render obvious, one or more of the Asserted Claims of the '564 Patent.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional disclosures or support for a particular claim element. Each and every disclosure of the same limitation in the same reference is not necessarily identified. In addition, persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature and in the context of their knowledge as persons of ordinary skill in the art. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, other evidence, or that within the knowledge of a person of ordinary skill in the art such as, for example, a motivation to combine,

such persons of ordinary skill in the art would rely on other information within the reference, along with other publications and their general scientific knowledge and experience in the field. Thus, each prior art reference identified herein should be understood in the context of the reference itself in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors or an expert testifying as to the knowledge of a person of ordinary skill in the art. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Defendant may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

Lam provides below exemplary references that anticipate and/or render obvious the Asserted Claims of the ’564 Patent.

- U.S. Patent Publication No. 2011/0293888 (“Stowers ’888”)
- Stowers, Jason K. *Direct patterning of solution deposited metal oxides*. Oregon State University, 2008 (“Stowers 2008”)
- Stowers et al., “Directly Patterned Inorganic Hardmask for EUV lithography,” Proc. of SPIE 7969: 796915 (2011) (“Stowers 2011”)
- Trikeriotis et al. *Development of an inorganic photoresist for DUV, EUV, and electron beam imaging*. Advances in Resist Materials and Processing Technology XXVII. Vol. 7639. SPIE, 2010 (“Trikeriotis 2010”)
- Matsuzawa et al. *Theoretical estimation of absorption coefficients of various polymers at 13nm*. Journal of Photopolymer Science and Technology 12.4 (1999): 571-576 (“Matsuzawa”)

The prior art identified above, and in the attached ’564 charts, demonstrate the anticipation and/or obviousness of the Asserted Claims of the ’564 Patent. Specifically, each Asserted Claim of the ’564 Patent is anticipated and/or rendered obvious by Stowers 2008, Stowers 2011, Matsuzawa, Trikeriotis 2010, alone or in combination.

The references disclosed in the attached chart and herein are also directed to the same or similar features as the purported invention claimed in the Asserted Claims of the ’564 Patent. To the extent Inpria contends that any of these features solved a problem in the art, the references cited herein show that that problem was known to those of ordinary skill and had already been solved using obvious solutions.

To that end, the Asserted Claims of the ’564 Patent simply combine elements already combined and well known in the art and yield no more than what one skilled in the art would have expected from such a combination. For example, with respect to the ’564 Patent, when confronted with the alleged problems described in the ’564 Patent, one of ordinary skill in the art at the time of the alleged inventions would have been motivated to consider the techniques taught by the prior art cited in these Initial Invalidity Contentions. Consideration of the teachings of this prior art, both individually and in combination, would necessarily lead to the alleged invention claimed in the ’564 Patent. This is demonstrated by the cited prior art, which disclose all of the elements of the Asserted Claims of the ’564 Patent, as well as motivations to modify or combine their individual teachings. One of skill in the art would have been motivated to either modify the prior art identified in the claim charts or to combine that prior art in the manner indicated, by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces.

Additionally, Lam hereby incorporates by reference the motivations to combine references set forth during the prosecution of the Asserted Claims of the ’564 Patent, including the statements and reasoning set forth by the examiner, as to why it would have been obvious to modify or combine references to achieve the limitations of the Asserted Claims of the ’564 Patent.

C. Invalidity for Lack of Written Description and/or Enablement

The Asserted Claims of the ’564 Patent are invalid for failing to satisfy the written description and enablement requirements under 35 U.S.C. § 112. For example, Asserted Claim 1 broadly covers a film comprising “metal ions with radiation sensitive ligands.” ’564 Patent at claim 1. The term “metal ion” defines a broad potentially limitless class of molecules. Likewise, “radiation sensitive ligands” is structurally undefined and it covers a limitless number of possible ligands. Thus, the scope of the Asserted Claims of the ’564 Patent is extremely broad, covering a limitless number of different films comprising “metal ions with radiation sensitive ligands.”

But the specification of the ’564 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the claimed genus. The specification describes only two films within the claimed genus: a first film comprising zirconium suboxide cations with peroxide-based ligands and a second film comprising hafnium suboxide cations with peroxide-based ligands. These are the only films that are arguably shown to exhibit the claimed property of “wherein exposure of the coating material to UV, EUV and/or electron-beam radiation alters the chemical properties of the coating material creating an exposed coating material with differential dissolution rates between exposed and un-exposed regions of the coating material.” ’564 Patent at Example 3 (describing 193 nm patterning of a “Zr based coating Material”) and Example 4 (describing EUV patterning of a “Hf suboxide based coating material”). The disclosure two film species is far from what is required to show possession the full genus encompassed by the claims. *Idenix*, 941 F.3d at 1164 (“relatively few representative examples” do not suffice where, as here,

"tens or hundreds of thousands of possible" structural candidates exist). The '564 Patent likewise does not identify any common structural features of the claimed films comprising "metal ions with radiation sensitive ligands" that would permit the POSA to visualize the members of the genus by their structure. As such, a person of skill in the art, reading the '564 Patent's disclosure would not conclude that the inventors were in possession of the method claimed.

Moreover, the '564 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the claimed average thickness of the structure of claim 1 (i.e. "5 nm to 30 nm") or claim 6 (i.e. "5 nm to 25 nm"). Although the '564 Patent discloses "average" coating thickness ranges that would encompass the claimed ranges, the '564 Patent does not disclose the claimed range endpoints of claims 1 and 6. Institution Decision of IPR2024-00033 at 14. Therefore, a person of skill in the art, reading the '564 Patent's disclosure would not conclude that the inventors were in possession of the average thicknesses claimed.[3]

The '564 Patent's disclosure is likewise insufficient to inform those skilled in the art how to both make and use the full scope of the claimed invention without undue experimentation. The specification of the '564 Patent does not provide meaningful guidance or working examples that would permit one of skill to avoid excessive and undue experimentation. As noted, the specification describes only two films within the claimed genus: a first film comprising zirconium suboxide cations with peroxide-based ligands and a second film comprising hafnium suboxide cations with peroxide-based ligands. It is not enough for the patent to merely provide a "starting point" from which one of skill in the art must "engage in an iterative, trial-and-error process to practice the claimed invention . . . ." *Wyeth*, 720 F.3d at 1386. And here, the specification does not provide guidance for developing additional films comprising "metal ions with radiation sensitive

[3] The Asserted Claims of the '564 Patent are only entitled to a priority date of September 18, 2015 (i.e. the filing date of the '612 application), and thus are anticipated by Stowers '888.

ligands" falling within the claimed genus with the disclosed hafnium or zirconium films as a starting point. As such, a person of skill in the art, reading the '564 Patent's disclosure would not be able to both make and use the full scope of the claimed invention without undue experimentation.

Moreover, the specification of the '564 Patent does not provide sufficient description or enablement of effective patterning using UV or EUV doses at the entire range of "no more than about 100 mJ/cm^2." Instead, one of ordinary skill in the art would have to make and test all films within the claimed genus and at the entire range of UV or EUV doses of "no more than about 100 mJ/cm^2" to identify those that can be effectively patterned. The specification of the '564 Patent provides at best two EUV doses that provide effective patterning of films arguably within the claimed genus: 20 mJ/cm^2 and 80 mJ/cm^2. *Id.* at Example 3 (describing EUV patterning of a "Zr based coating Material" at a dose level of 20 mJ/cm^2) and Example 4 (describing EUV patterning of a "Hf suboxide based coating material" at a dose level of 80 mJ/cm^2). As such, a person of skill in the art, reading the '564 Patent's disclosure would not be able to both make and use the full scope of the claimed invention without undue experimentation.

D. Indefiniteness

Defendant identifies the following claim terms as being indefinite. Defendant notes that its investigation into terms for construction and the parties exchange of terms for construction may affect these indefiniteness contentions (*e.g.*, resolve these issues and/or highlight additional definiteness issues). As such, Defendant reserves the right to modify and/or supplement its contentions, including through claim construction disclosures, as it deems appropriate.

Term	Description of Contention

"metal ions" *'564 Patent, cl. 1.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because it is unclear whether or not the metal must have a positive charge.
"radiation sensitive ligands" *'564 Patent, cl. 1.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because the structure of the ligands is unclear.
"wherein the metal ions comprise metal suboxide ions" *'564 Patent, cl. 2.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because it is unclear whether or not the metal must have a positive charge.

VII. THE '312 PATENT IS INVALID

A. The '312 Patent Priority Date

The earliest claimed priority date of the '312 Patent is August 4, 2010. Plaintiff has provided no evidence to support an earlier priority date. To the extent Plaintiff alleges that any prior art relied on in these invalidity contentions does not qualify as prior art to the Asserted Patent, Defendant reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Defendant contends that the prior art references described and charted in Exhibits 11-12 anticipate and/or render obvious, one or more of the Asserted Claims of the '312 Patent.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional disclosures or support for a particular claim element. Each and every disclosure of the same limitation in the same reference is not necessarily identified. In addition, persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature and in the context of their knowledge as persons of ordinary skill in the art. Thus, to understand and interpret any

specific statement or disclosure within a prior art reference, other evidence, or that within the knowledge of a person of ordinary skill in the art such as, for example, a motivation to combine, such persons of ordinary skill in the art would rely on other information within the reference, along with other publications and their general scientific knowledge and experience in the field. Thus, each prior art reference identified herein should be understood in the context of the reference itself in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors or an expert testifying as to the knowledge of a person of ordinary skill in the art. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Defendant may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

Lam provides below exemplary references that render obvious the Asserted Claims of the ’312 Patent.

- Stowers, Jason K. *Direct patterning of solution deposited metal oxides*. Oregon State University, 2008 (“Stowers 2008”)
- U.S. Patent Publication No. 2005/0242330 (“Herman ’330”)
- U.S. Patent No. 3,874,916 (“Livesay ’916”)
- U.S. Patent Publication No. 2009/0215272 (“Lam ’272”)

The prior art identified above, and in the attached ’312 chart, demonstrate the anticipation and/or obviousness of the Asserted Claims of the ’312 Patent. Specifically, each Asserted Claim

is anticipated and/or rendered obvious by Stowers 2008, Herman ’330, Livesay ’916, Lam ’272, alone or in combination.

The references disclosed in the attached chart and herein are also directed to the same or similar features as the purported invention claimed in the Asserted Claims of the ’312 Patent. To the extent Inpria contends that any of these features solved a problem in the art, the references cited herein show that that problem was known to those of ordinary skill and had already been solved using obvious solutions.

To that end, the Asserted Claims of the ’312 Patent simply combine elements already combined and well known in the art and yield no more than what one skilled in the art would have expected from such a combination. For example, with respect to the ’312 Patent, when confronted with the alleged problems described in the ’312 Patent, one of ordinary skill in the art at the time of the alleged inventions would have been motivated to consider the techniques taught by the prior art cited in these Initial Invalidity Contentions. Consideration of the teachings of this prior art, both individually and in combination, would necessarily lead to the alleged invention claimed in the ’312 Patent. This is demonstrated by the cited prior art, which disclose all of the elements of the Asserted Claims of the ’312 Patent, as well as motivations to modify or combine their individual teachings. One of skill in the art would have been motivated to either modify the prior art identified in the claim charts or to combine that prior art in the manner indicated, by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces.

Additionally, Lam hereby incorporates by reference the motivations to combine references set forth during the prosecution of the Asserted Claims of the ’312 Patent, including the statements

and reasoning set forth by the examiner, as to why it would have been obvious to modify or combine references to achieve the limitations of the Asserted Claims of the ’312 Patent.

C. Invalidity for Lack of Written Description and/or Enablement

The Asserted Claims of the ’312 Patent are invalid for failing to satisfy the written description and enablement requirements under 35 U.S.C. § 112. For example, Asserted Claim 1 broadly covers a film comprising “metal ions with radiation sensitive ligands.” ’312 Patent at claim 1. The term “metal ion” defines a broad potentially limitless class of molecules. Likewise, “radiation sensitive ligands” is structurally undefined and it covers a limitless number of possible ligands. Thus, the scope of the Asserted Claims of the ’312 Patent is extremely broad, covering a virtually limitless number of different films comprising “metal ions with radiation sensitive ligands.”

But the specification of the ’312 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the claimed genus. The specification describes only two films within the claimed genus: a first film comprising zirconium suboxide cations with peroxide-based ligands and a second film comprising hafnium suboxide cations with peroxide-based ligands. These are the only films that are arguably shown to exhibit the claimed property of “wherein exposure of the coating material to UV, EUV and/or electron-beam radiation alters the chemical properties of the coating material creating an exposed coating material with differential dissolution rates between exposed and un-exposed regions of the coating material.” ’312 Patent at Example 3 (describing 193 nm patterning of a “Zr based coating Material”) and Example 4 (describing EUV patterning of a “Hf suboxide based coating material”). The disclosure two film species is far from what is required to show possession the full genus encompassed by the claims. *Idenix*, 941 F.3d at 1164 (“relatively few representative examples” do not suffice where, as here, “tens or hundreds of thousands of possible” structural candidates exist). The ’312 Patent likewise

does not identify any common structural features of the claimed films comprising "metal ions with radiation sensitive ligands" that would permit the person of ordinary skill in the art to visualize the members of the genus by their structure. As such, a person of skill in the art, reading the '312 Patent's disclosure would not conclude that the inventors were in possession of the method claimed.

The '312 Patent's disclosure is likewise insufficient to inform those skilled in the art how to both make and use the full scope of the claimed invention without undue experimentation. The specification of the '312 Patent does not provide meaningful guidance or working examples that would permit one of skill to avoid excessive and undue experimentation. As noted, the specification describes only two films within the claimed genus: a first film comprising zirconium suboxide cations with peroxide-based ligands and a second film comprising hafnium suboxide cations with peroxide-based ligands. It is not enough for the patent to merely provide a "starting point" from which one of skill in the art must "engage in an iterative, trial-and-error process to practice the claimed invention . . . ." *Wyeth*, 720 F.3d at 1386. And here, the specification does not provide guidance for developing additional films comprising "metal ions with radiation sensitive ligands" falling within the claimed genus with the disclosed hafnium or zirconium films as a starting point. As such, a person of skill in the art, reading the '312 Patent's disclosure would not be able to both make and use the full scope of the claimed invention without undue experimentation.

D. Indefiniteness

Defendant identifies the following claim terms as being indefinite. Defendant notes that its investigation into terms for construction and the parties exchange of terms for construction may affect these indefiniteness contentions (*e.g.*, resolve these issues and/or highlight additional

definiteness issues). As such, Defendant reserves the right to modify and/or supplement its contentions, including through claim construction disclosures, as it deems appropriate.

Term	Description of Contention
"metal ions" *'312 Patent, cl. 1.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because it is unclear whether or not the metal must have a positive charge.
"radiation sensitive ligands" *'312 Patent, cl. 1.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because the structure of the ligands is unclear.

VIII. THE '903 PATENT IS INVALID

A. The '903 Patent Priority Date

The earliest claimed priority date of the '903 Patent is April 11, 2018. Plaintiff has provided no evidence to support an earlier priority date. To the extent Plaintiff alleges that any prior art relied on in these invalidity contentions does not qualify as prior art to the Asserted Patent, Defendant reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Defendant contends that the prior art references described and charted in Exhibits 13 anticipate and/or render obvious, one or more of the Asserted Claims of the '903 Patent.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional disclosures or support for a particular claim element. Each and every disclosure of the same limitation in the same reference is not necessarily identified. In addition, persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature and in the context of

their knowledge as persons of ordinary skill in the art. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, other evidence, or that within the knowledge of a person of ordinary skill in the art such as, for example, a motivation to combine, such persons of ordinary skill in the art would rely on other information within the reference, along with other publications and their general scientific knowledge and experience in the field. Thus, each prior art reference identified herein should be understood in the context of the reference itself in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors or an expert testifying as to the knowledge of a person of ordinary skill in the art. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Defendant may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

Lam provides below exemplary references that render obvious the Asserted Claims of the ’903 Patent.

- Hanssgen, D., et al. “Synthesis of the First Mono-t-Butyltin Element Compounds.” J. Organometallic Chemistry 293 (1985): 191-195 (“Hanssgen”)
- Lorberth, Jörg. “Cleavage of the tin-nitrogen bond: (dialkylamino) stannanes and their reactions with alkylating agents.” J. Organometallic Chemistry 16 (1969): 235-248 (“Lorberth”)
- Othen, David George. Studies in the Organonitrogen Chemistry of Tin and Neighbouring Elements, April 1977, University of Durham (“Othen”)

- Pereyre, Michel et al. Tin in Organic Synthesis. Butterworth & Co. (1987) ("Pereyre")
- U.S. Patent Publication No. 2016/0116839 ("Meyers '839")

The prior art identified above, and in the attached '903 chart, demonstrate the anticipation and/or obviousness of the Asserted Claims of the '903 Patent. Specifically, each Asserted Claim is rendered obvious by Meyers '839, Hanssgen, Lorberth, Othen, Pereyre, alone or in combination.

The references disclosed in the attached chart and herein are also directed to the same or similar features as the purported invention claimed in the Asserted Claims of the '903 Patent. To the extent Inpria contends that any of these features solved a problem in the art, the references cited herein show that that problem was known to those of ordinary skill and had already been solved using obvious solutions.

To that end, the Asserted Claims of the '903 Patent simply combine elements already combined and well known in the art and yield no more than what one skilled in the art would have expected from such a combination. For example, with respect to the '903 Patent, when confronted with the alleged problems described in the '903 Patent, one of ordinary skill in the art at the time of the alleged inventions would have been motivated to consider the techniques taught by the prior art cited in these Initial Invalidity Contentions. Consideration of the teachings of this prior art, both individually and in combination, would necessarily lead to the alleged invention claimed in the '903 Patent. This is demonstrated by the cited prior art, which disclose all of the elements of the Asserted Claims of the '903 Patent, as well as motivations to modify or combine their individual teachings. One of skill in the art would have been motivated to either modify the prior art identified in the claim charts or to combine that prior art in the manner indicated, by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces.

Additionally, Lam hereby incorporates by reference the motivations to combine references set forth during the prosecution of the Asserted Claims of the ’903 Patent, including the statements and reasoning set forth by the examiner, as to why it would have been obvious to modify or combine references to achieve the limitations of the Asserted Claims of the ’903 Patent.

C. Invalidity for Lack of Written Description and/or Enablement

The Asserted Claims of the ’903 Patent are invalid for failing to satisfy the written description and enablement requirements under 35 U.S.C. § 112. For example, Asserted Claim 1 is broadly directed to a high purity liquid composition comprising a monoalkyl tin triamide compound represented by the chemical formula $RSn(NR'_2)_3$ and no more than 0.5 mole % dialkyltin compounds as an impurity relative to the total tin amount. But the specification of the ’903 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the claimed high purity liquid, not to mention, one using the full scope of compounds represented by the formula $RSn(NR'_2)_3$.

As recited in claim 1, R and R’ in formula $RSn(NR'_2)_3$ can be any hydrocarbyl group with 1-31 carbon atoms or 1-10 carbon atoms, respectively. The specification of the ‘903 Patent does not define “hydrocarbyl group,” but discloses numerous embodiments of “hydrocarbyl groups” including “hydrocarbyl groups” that may also be substituted with “hetero-atom functionality.” ‘903 Patent at col. 5, lines 52-55. This represents an incredibly broad genus of compounds, potentially encompassing thousands if not hundreds of thousands of different compounds.

But the specification of the ’903 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the claimed genus. The specification describes only one liquid composition within the claimed genus: a $t\text{-}BuSn(NMe_2)_3$ composition. This is the only high purity liquid composition that is arguably shown to exhibit the claimed property of “no more than 0.5 mole % dialkyltin compounds as an impurity relative to the total tin amount.” ’903 Patent at

Example 8 (describing 193 nm patterning of a "Zr based coating Material") and Example 4 (describing "fractional distillation to purify t-BuSn$(NMe_2)_3$"). The disclosure of one high purity liquid composition species is far from what is required to show possession of the full genus encompassed by the claims. *Idenix*, 941 F.3d at 1164 ("relatively few representative examples" do not suffice where, as here, "tens or hundreds of thousands of possible" structural candidates exist). As such, a person of skill in the art, reading the '903 Patent's disclosure would not conclude that the inventors were in possession of the high purity liquid claimed.

D. Indefiniteness

Defendant identifies the following claim terms as being indefinite. Defendant notes that its investigation into terms for construction and the parties exchange of terms for construction may affect these indefiniteness contentions (*e.g.*, resolve these issues and/or highlight additional definiteness issues). As such, Defendant reserves the right to modify and/or supplement its contentions, including through claim construction disclosures, as it deems appropriate.

Term	Description of Contention
"hydrocarbyl group" *'903 Patent, clm. 1.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because the structure of the hydrocarbyl group is unclear.

IX. THE '153 PATENT IS INVALID

A. The '153 Patent Priority Date

The '153 Patent issued from application 14/920,107 ("'107 application"), filed October 22, 2015, and purports to claim priority to application 62/067,552 ("'552 application"), filed October 23, 2014, and application 62/119,972 ("'972 application"), filed February 24, 2015.

Claims 11-16

Claims 11-16 of the ’153 Patent are not entitled to an effective filing date earlier than October 22, 2015, when the ’107 application was filed. Claim 11 of the ’153 Patent claims a method for patterning a film on a substrate comprising the step of exposing the film with patterned EUV doses of “no more than about 80 mJ/cm^2.” Claim 12 limits the EUV dose to “from about 12 mJ/cm^2 to about 75 mJ/cm^2.” Claims 12-16 depend from claim 11 and inherit the limitation of an EUV dose of no more than 80 mJ/cm^2. However, neither the ’552 application nor the ’072 application discloses these EUV dose limitations.

Instead, both the ’552 application and the ’972 application disclose that the EUV dose may be “from about 1 mJ/cm^2 to 150 mJ/cm^2,” “from about 2 mJ/cm^2 to about 100 mJ/cm^2,” or “from about 3 mJ/cm^2 to about 50 mJ/cm^2.” ‘552 application at pg. 10 lines 5-10; ’972 application at pg. 10, lines 15-20. The ’972 provisional further discloses an EUV dose “from about 25 mJ/cm^2 to about 60 mJ/cm^2.” ’972 application at pg. 13, lines 1-5.

The ranges disclosed in the ’552 application and ’972 application do not provide adequate written description of the claimed EUV dose ranges. *See RAI Staregic Holdings, Inc. v. Philip Morris Prods. S.A.*, 92 F.4th 1085, 1088-91 (Fed. Cir. 2024); *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*). Accordingly, claims 11-16 are not entitled to claim priority to either the ’552 application or the ’972 application, and the effective filing date of claims 11-16 of the ’153 Patent is not earlier than October 22, 2015.

Claims 18-21

Claims 18-21 of the ’153 Patent are not entitled to an effective filing date earlier than October 22, 2015, when the ’107 application was filed. Claim 18 of the ’153 Patent claims a pattered structure comprising a coating wherein “at least portions of the coating are represented by the formulation $(R)_zSnO_{2-z/2-x/2}(OH)_x$ ($z>0$, $x>0$, and $0 < (x+z) < 4$), where R is an alkyl group

bonded to the tin at a secondary or tertiary carbon atom." Claims 19-21 depend from claim 18 and inherit that limitation.

The '552 application discloses only that the coating may include RSnOOH, where R is a secondary or tertiary alkyl group. '552 application at pg. 12, lines 14-18. The '972 application discloses that the coating may include $RSnO_{(3/2-x/2)}(OH)_x$, which is narrower than the formula claimed in claims 18-21 of the '153 Patent. '927 application at page 13, lines 10-12. Disclosure of a species can only support the written description of a genus where there is "either a representative number of species falling within the scope of the genus or structural features common to the members of the genus so that one of skill in the art can 'visualize or recognize' the members of the genus." *Ariad Pharms.*, 598 F.3d at 1350 (en banc).

Here, neither the '552 application nor the '972 application discloses *any* species where there is more *or less* than 1 R group (i.e., where $z > 1$ or $0<z<1$). Moreover, the only common structure in the '552 application and the '972 application is that a *single* R group is bound to the tin. Accordingly, claims 18-21 are not entitled to claim priority to either the '552 application or the '972 application, and the effective filing date of claims 18-21 of the '153 Patent is not earlier than October 22, 2015.

To the extent Plaintiff alleges that any prior art relied on in these invalidity contentions does not qualify as prior art to the Asserted Patent, Defendant reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Defendant contends that the prior art references described and charted in Exhibits 14-18 anticipate and/or render obvious, one or more of the Asserted Claims of the '153 Patent.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional disclosures or support for a particular claim element. Each and every disclosure of the same limitation in the same reference is not necessarily identified. In addition, persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature and in the context of their knowledge as persons of ordinary skill in the art. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, other evidence, or that within the knowledge of a person of ordinary skill in the art such as, for example, a motivation to combine, such persons of ordinary skill in the art would rely on other information within the reference, along with other publications and their general scientific knowledge and experience in the field. Thus, each prior art reference identified herein should be understood in the context of the reference itself in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors or an expert testifying as to the knowledge of a person of ordinary skill in the art. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Defendant may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

Lam provides below exemplary references that render obvious the Asserted Claims of the ’153 Patent.

- Cardineau, Brian. Molecular Organometallic Resists for EUV (MORE), EUV Symposium TWG, Toyama Japan (October 6, 2013) ("Cardineau Symposium Presentation")
- Cardineau, Brian, et al. "Photolithographic properties of tin-oxo clusters using extreme ultraviolet light (13.5 nm)." Microelectronic engineering 127 (2014): 44-50 ("Cardineau Paper")
- U.S. Patent Publication No. 2011/0293888 ("Stowers '888")
- U.S. Patent No. 5,698,262 ("Soubeyrand '262")
- Blanksby, Stephen J., and G. Barney Ellison. "Bond dissociation energies of organic molecules." Accounts of chemical research 36.4 (2003): 255-263 ("Blanksby")
- U.S. 2015/0056542 ("Meyers '542")
- U.S. Patent Publication No. 2009/0155546 ("Yamashita '564")
- Stowers, "Direct Patterning of Solution Deposited Metal Oxides" (August 14, 2008) (Ph.D. Dissertation, Oregon State University) ("Stowers 2008")
- Trikeriotis et al., "Nanoparticle Photoresists from HfO2 and ZrO2 for EUV Patterning," J. of Photopolymer Sci. & Tech., 25(5):583 (2012) ("Trikeriotis 2012")
- Stowers et al., "Directly Patterned Inorganic Hardmask for EUV lithography," PROC. OF SPIE 7969: 796915 (2011) ("Stowers 2011")
- Jaumier, et al., "New Route to Monoorganotin Oxides and Alkoxides from Trialkynylorganotins," CHEM. COMMUN. 1998(3):369 (1998) ("Jaumier")
- Banse et al., "Hydrolysis of Monobutyltin Trialkoxides: Synthesis and Characterizations of $\{(BuSn)_{12}O_{14}(OH)_6\}OH_2$" J. INORGANIC CHEMISTRY 34:6371-79 (1995) ("Banse")
- Krysak, "Small Molecule Photoresist Materials for Next Generation Lithography," (January 2013) (Ph.D. Dissertation, Cornell University) ("Krysak Dissertation")
- Ekinci et al., "Evaluation of Resist Performance with EUV Interference Lithography for Sub-22-nm Patterning," PROC. OF SPIE, 8322: 83220W (2012) ("Ekinci")

The prior art identified above, and in the attached '153 chart, demonstrate the anticipation and/or obviousness of the Asserted Claims of the '153 Patent. Specifically, each Asserted Claim of the '153 Patent is anticipated and/or rendered obvious by Yamashita '564, Cardineau Paper, Cardineau Symposium Presentation, Stowers 2008, Trikeriotis 2012, Stowers 2011, Stowers '888, Jaumier, Krysak, Ekinci, Blanksby, Banse, Meyers '542, Soubeyrand '262, alone or in combination.

The references disclosed in the attached chart and herein are also directed to the same or similar features as the purported invention claimed in the Asserted Claims of the ’153 Patent. To the extent Inpria contends that any of these features solved a problem in the art, the references cited herein show that that problem was known to those of ordinary skill and had already been solved using obvious solutions.

To that end, the Asserted Claims of the ’153 Patent simply combine elements already combined and well known in the art and yield no more than what one skilled in the art would have expected from such a combination. For example, with respect to the ’153 Patent, when confronted with the alleged problems described in the ’153 Patent, one of ordinary skill in the art at the time of the alleged inventions would have been motivated to consider the techniques taught by the prior art cited in these Initial Invalidity Contentions. Consideration of the teachings of this prior art, both individually and in combination, would necessarily lead to the alleged invention claimed in the ’153 Patent. This is demonstrated by the cited prior art, which disclose all of the elements of the Asserted Claims of the ’153 Patent, as well as motivations to modify or combine their individual teachings. One of skill in the art would have been motivated to either modify the prior art identified in the claim charts or to combine that prior art in the manner indicated, by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces.

Additionally, Lam hereby incorporates by reference the motivations to combine references set forth during the prosecution of the Asserted Claims of the ’153 Patent, including the statements and reasoning set forth by the examiner, as to why it would have been obvious to modify or combine references to achieve the limitations of the Asserted Claims of the ’153 Patent.

C. Invalidity for Lack of Written Description and/or Enablement

The Asserted Claims of the ’153 Patent are invalid for failing to satisfy the written description and enablement requirements under 35 U.S.C. § 112. For example, Asserted Claim 1 is broadly directed to a method of patterning a film on a substrate wherein a film comprising a compound of formula $RSnO_{(3/2-x/2)}(OH)_x$ is exposed to EUV and developed to form features at half-pitch no more than about 25 nm and linewidth roughness no more than about 5 nm. Asserted Claim 18 is broadly directed to a patterned structure with a coating comprising a compound of formula $(R)_zSnO_{2-z/2-x/2}(OH)_x$ having features with a half-pitch of no more than about 25 nm. But the specification of the ’153 Patent does not reasonably convey to those skilled in the art that the inventors had possession of the method or the patterned structure, not to mention, one using the full scope of compounds represented by the formula $RSnO_{(3/2-x/2)}(OH)_x$ or $(R)_zSnO_{2-z/2-x/2}(OH)_x$.

As recited in claim 1, R in formula $(R)_zSnO_{2-z/2-x/2}(OH)_x$ can be any alkyl group bonded to the tin, and in claim 18, R in formula $RSnO_{(3/2-x/2)}(OH)_x$ can be any alkyl group bonded to the tin at a secondary or tertiary carbon atom. Each of these formulae represent an incredibly broad genus of compounds, each potentially encompassing thousands if not hundreds of thousands of different compounds. The specification at best discloses three species falling within the genus. *Idenix* , 941 F.3d at 1164 (“relatively few representative examples” do not suffice where, as here, “tens or hundreds of thousands of possible” structural candidates exist). As such, a person of skill in the art, reading the ’153 Patent’s disclosure would not conclude that the inventors were in possession of the method or structure claimed.

The ’153 Patent’s disclosure is likewise insufficient to inform those skilled in the art how to both make and use the full scope of the claimed invention without undue experimentation. The specification of the ’153 Patent does not provide meaningful guidance or working examples that would permit one of skill to avoid excessive and undue experimentation. Here, the specification

of the '153 Patent fails to disclose *any* common structural feature that would allow one of ordinary skill in the art to distinguish functional films (i.e., those that can be developed to form features at half-pitch no more than about 25 nm and linewidth roughness no more than about 5 nm), and thus does not enable the full scope of the claimed genuses of compounds. Moreover, the specification of the '153 Patent does not provide sufficient description or enablement of patterning using EUV doses at the entire range of "no more than about 80 mJ/cm^2" to form features at half-pitch no more than about 25 nm and linewidth roughness no more than about 5 nm. Instead, one of ordinary skill in the art would have to make and test all films within the claimed chemical genuses and at the entire range of EUV doses of "no more than about 80 mJ/cm^2" to identify those that can be developed to form features at half-pitch no more than about 25 nm and linewidth roughness no more than about 5 nm. It is not enough for the patent to merely provide a "starting point" from which one of skill in the art must "engage in an iterative, trial-and-error process to practice the claimed invention . . . ." *Wyeth*, 720 F.3d at 1386. As such, a person of skill in the art, reading the '153 Patent's disclosure would not conclude that the inventors were in possession of the method or structure claimed.

D. Indefiniteness

Defendant identifies the following claim terms as potentially giving rise to indefiniteness. Defendant notes that its investigation into terms for construction and the parties exchange of terms for construction may affect these indefiniteness contentions (*e.g.*, resolve these issues and/or highlight additional definiteness issues). As such, Defendant reserves the right to modify and/or supplement its contentions, including through claim construction disclosures, as it deems appropriate.

X. THE ’684 PATENT IS INVALID

A. The ’684 Patent Priority Date

The earliest claimed priority date of the ’684 Patent is April 22, 2013. Plaintiff has provided no evidence to support an earlier priority date. To the extent Plaintiff alleges that any prior art relied on in these invalidity contentions does not qualify as prior art to the Asserted Patent, Defendant reserves the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for the Asserted Patent and/or Asserted Claim).

B. Identification of Prior Art

Defendant contends that the prior art references described and charted in Exhibits 19-20 anticipate and/or render obvious, one or more of the Asserted Claims of the ’684 Patent.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional disclosures or support for a particular claim element. Each and every disclosure of the same limitation in the same reference is not necessarily identified. In addition, persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature and in the context of their knowledge as persons of ordinary skill in the art. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, other evidence, or that within the knowledge of a person of ordinary skill in the art such as, for example, a motivation to combine, such persons of ordinary skill in the art would rely on other information within the reference, along with other publications and their general scientific knowledge and experience in the field. Thus, each prior art reference identified herein should be understood in the context of the reference itself in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system

embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors or an expert testifying as to the knowledge of a person of ordinary skill in the art. Defendant may rely upon uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Defendant may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

Lam provides below exemplary references that render obvious the Asserted Claims of the ’684 Patent.

- Thesis Defense Presentation of Brian Cardineau titled Novel Resist Systems for EUV Lithography: LER, Chain-Scission, Nanoparticle and MORE. State University of New York at Albany, May 20, 2013 (“Cardineau Thesis Presentation”)
- U.S. Patent Publication No. 2011/0195362 (“Watanabe ’362”)
- Stowers et al., “Directly Patterned Inorganic Hardmask for EUV lithography,” PROC. OF SPIE 7969: 796915 (2011) (“Stowers 2011”)
- Trikeriotis et al., “Development of an Inorganic Photoresist for DUV, EVU, and Electron Beam Imaging,” PROC. OF SPIE 7639:39390E-1 (2010) (“Trikeriotis 2010”)
- Trikeriotis et al., “Nanoparticle Photoresists from HfO2 and ZrO2 for EUV Patterning,” J. OF PHOTOPOLYMER SCI. & TECH., 25(5):583 (2012) (“Trikeriotis 2012”)
- Ouyang, Christine, “Non-Aqueous Negative-Tone Development of Inorganic Metal Oxide Nanoparticle Photoresists for Next Generation Lithography,” PROC. OF SPIE 8682: 86820R (2013) (“Ouyang”)
- U.S. Patent Publication No. 2011/0293888 (“Stowers ’888”)
- Stowers, “Direct Patterning of Solution Deposited Metal Oxides” (August 14, 2008) (Ph.D. Dissertation, Oregon State University) (“Stowers 2008”)
- U.S. Patent Publication No. 2009/0155546 (“Yamashita ’564”)

- Abe et al., "Preparation and Properties of Flexible Thin Films by Acid-Catalyzed Hydrolytic Polycondensation of Methyltrimethoxysilane," J. POLYMER SCIENCE: PART A: POLYMER CHEMISTRY 33(4):751-4 (1995) ("Abe")
- Kryask et al., "Nanoparticle Photoresists: Ligand Exchange as a New and Sensitive EUV Patterning Mechanism," J. PHOTOPOLYMER SCI. & TECH. 26(5):659-64 (2013) ("Kryask Article")
- Ouyang, Christine, "Non-Aqueous Negative-Tone Development of Inorganic Metal Oxide Nanoparticle Photoresists for Next Generation Lithography," Proc. of SPIE 8682: 86820R (2013) ("Ouyang")
- Banse et al., "Hydrolysis of Monobutyltin Trialkoxides: Synthesis and Characterizations of $\{(BuSn)_{12}O_{14}(OH)_6\}OH_2$" J. INORGANIC CHEMISTRY 34:6371-79 (1995) ("Banse")
- Jaumier, et al., "New Route to Monoorganotin Oxides and Alkoxides from Trialkynylorganotins," Chem. Commun. 1998(3):369 (1998) ("Jaumier")

The prior art identified above, and in the attached '684 chart, demonstrate the anticipation and/or obviousness of the Asserted Claims of the '684 Patent. Specifically, each Asserted Claim of the '684 Patent is anticipated and/or rendered obvious by Yamashita '564, Stowers '888, Krysak, Ouyang, Banse, Jaumier, Stowers 2008, Cardineau Thesis Presentation, Watanabe '362, Stowers 2011, Trikeriotis 2010, Trikeriotis 2012, alone or in combination.

The references disclosed in the attached chart and herein are also directed to the same or similar features as the purported invention claimed in the Asserted Claims of the '684 Patent. To the extent Inpria contends that any of these features solved a problem in the art, the references cited herein show that that problem was known to those of ordinary skill and had already been solved using obvious solutions.

To that end, the Asserted Claims of the '684 Patent simply combine elements already combined and well known in the art and yield no more than what one skilled in the art would have expected from such a combination. For example, with respect to the '684 Patent, when confronted with the alleged problems described in the '684 patent, one of ordinary skill in the art at the time of the alleged inventions would have been motivated to consider the techniques taught by the prior

art cited in these Initial Invalidity Contentions. Consideration of the teachings of this prior art, both individually and in combination, would necessarily lead to the alleged invention claimed in the ’684 Patent. This is demonstrated by the cited prior art, which disclose all of the elements of the Asserted Claims of the ’684 Patent, as well as motivations to modify or combine their individual teachings. One of skill in the art would have been motivated to either modify the prior art identified in the claim charts or to combine that prior art in the manner indicated, by, for example, their background knowledge, design incentives, effects of demands known to the design community, or other market forces.

Additionally, Lam hereby incorporates by reference the motivations to combine references set forth during the prosecution of the Asserted Claims of the ’684 Patent, including the statements and reasoning set forth by the examiner, as to why it would have been obvious to modify or combine references to achieve the limitations of the Asserted Claims of the ’684 Patent.

C. Invalidity for Lack of Written Description and/or Enablement

The Asserted Claims of the ’684 Patent are invalid for failing to satisfy the written description and enablement requirements under 35 U.S.C. § 112. For example, Asserted claim 1 is broadly directed to a method for patterning a substrate with radiation comprising irradiating a coated substrate along a selected pattern, wherein the coated substrate comprises a metal oxo-hydroxo network, heating the irradiated structure, and selectively developing the annealed irradiated structure. Asserted claim 10 is broadly directed to a coated substrate comprising a radiation sensitive coating having an average thickness from about 5 nm to about 200 nm and a thickness variation of no more than about 50% from the average at any point along the coating, and comprising a metal oxo-hydroxo network. Asserted claim 20 is broadly directed to a patterned substrate comprising a substrate with a surface and a first coating, the first coating comprising a metal oxo-hydroxo network. Claims 1, 10, 20 claim a “metal oxo-hydroxo network with metal

cations having organic ligands with metal carbon bonds and/or with metal carboxylate bonds," and further require that the oxo-hydroxo network comprises both M-O—H linkages and M-O-M linkages.

As recited in claims 1, 10, 20, any metal or organic ligand may be included in the oxo-hydroxo network. The claimed oxo-hydroxo network represents an incredibly broad genus of compounds, each potentially encompassing thousands if not hundreds of thousands of different compounds. At best the specification discloses *a single species*. See Col. 21 ll. 42-57 (the analysis was "consistent with a mono-modal distribution of particles with a mean diameter of ~2 nm, consistent with the reported diameter (Eychenne-Baron et al., Organometallics, 19 1940-1942 (2000)) of dodecameric butyltin hydroxide oxide polyatomic cations."). *Idenix*, 941 F.3d at 1164 ("relatively few representative examples" do not suffice where, as here, "tens or hundreds of thousands of possible" structural candidates exist). Here, the specification of the '684 Patent fails to disclose any species with a metal other than tin. Therefore, the specification of the '684 Patent does not inform one of ordinary skill in the art how to make or use the *entire scope* of the claimed invention. As such, a person of skill in the art, reading the '684 Patent's disclosure would not conclude that the inventors were in possession of the method or substrates claimed.

The '684 Patent's disclosure is likewise insufficient to inform those skilled in the art how to both make and use the full scope of the claimed invention without undue experimentation. The specification of the '684 Patent does not provide meaningful guidance or working examples that would permit one of skill to avoid excessive and undue experimentation. For example, Asserted claims 2-4, 20, 22 claim that the irradiated or un-irradiated coatings are soluble in organic or aqueous base solvents, respectively. Asserted claims 6, 23, 25, 26 claims specific pitch, widths, and line-width roughness of the irradiated structures. However, one of ordinary skill in the art

would have to make and test all films within the genus to identify those that can be developed to form features at half-pitch no more than about 25 nm and linewidth roughness no more than about 5 nm. It is not enough for the patent to merely provide a "starting point" from which one of skill in the art must "engage in an iterative, trial-and-error process to practice the claimed invention . . . ." *Wyeth*, 720 F.3d at 1386. As such, a person of skill in the art, reading the '684 Patent's disclosure would not conclude that the inventors were in possession of the method or structure claimed.

D. Indefiniteness

Defendant identifies the following claim terms as being indefinite. Defendant notes that its investigation into terms for construction and the parties exchange of terms for construction may affect these indefiniteness contentions (*e.g.*, resolve these issues and/or highlight additional definiteness issues). As such, Defendant reserves the right to modify and/or supplement its contentions, including through claim construction disclosures, as it deems appropriate.

Term	Description of Contention
"a thickness of no more than about 1 micron" *'684 Patent, cl. 7.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because the claim depends from claim 1 which recites a narrower thickness of 5 to 200 nm.
"metal cation" *'684 Patent, cls. 10, 20.*	This term fails to provide one of skill reasonable certainty regarding the scope of the claim because it is unclear whether or not the metal must have a positive charge.

In addition to the prior art identified in these Invalidity Contentions, and any future supplement to these Contentions, Lam may rely on relevant portions of the Asserted Inpria Patents Patents; the prosecution history of the Asserted Inpria Patents and any related patents and applications; any references listed in the References Cited portion of the Asserted Inpria Patents and any related patents and applications; any references cited or referenced in the Asserted Inpria

Patents and any related patents and applications; fact or expert testimony, inventor admissions, and any additional prior art located or developed during the course of discovery; any references known to Inpria or any affiliated party and the references cited in any invalidity contentions that have been or will be submitted in any action or proceedings involving the Asserted Inpria Patents or any related patent, including any related patent filed and/or issued outside the US; and any and all references cited in, and any and all documents filed in any United States Patent and Trademark Office (USPTO) proceedings related to the Asserted Inpria Patents or other related patents, including *Lam Research Corp. v. Inpria Corp.*, IPR2024-00033. Defendant reserves the right to supplement these disclosures based on further investigation and discovery.

XI. THE ASSERTED CLAIMS ARE INVALID AND UNENFORCEABLE ON ADDITIONAL GROUNDS

A. The Asserted Claims are unenforceable and invalid due to improper inventorship and under Pre-AIA § 102(f)/§ 101, and are unenforceable due to Plaintiff's inequitable conduct in obtaining each of the Asserted Patents.

Plaintiff's inequitable conduct by its (1) failure to disclose material prior art to the USPTO, and (2) failure to identify the true inventors of the Asserted Patents. Discovery is ongoing and Defendant reserves the right to supplement and/or modify its unenforceability contentions as its investigation progresses. Defendant further reserves the right to supplement and/or modify its unenforceability contentions based on developments and decisions in the *SUNY* case regarding true inventorship and ownership of the Asserted Patents. The allegations set forth in the original complaint and first amended complaint (D.I. 1 and 86, respectively), along with the exhibits and appendices filed therewith, in the *SUNY* case are hereby incorporated by reference.

1. Inequitable Conduct Due to Failure to Disclose Material Prior Art to USPTO

Inpria (i.e., those individuals having a duty to disclose under 37 C.F.R. § 1.56) failed to disclose material prior art to the USPTO during prosecution of its applications leading up to at

least the ’048, ’081, ’505, and ’153 Patents. Specifically, Inpria failed to disclose the existence of the Cardineau Paper and Cardineau Dissertation, both of which are prior art to the ’048, ’081, ’505, and ’153 Patents and anticipate and/or render obvious each of these patents’ Asserted Claims. *See supra* §§ III-VI and IX. . Fact discovery will reveal that Inpria, including at least named inventor Brian Cardineau, concealed the Cardineau Paper and Cardineau Dissertation with the intent to deceive the USPTO to obtain issuance of at least the ’048, ’081, ’505, and ’153 Patents.

As to the ’505 Patent, individuals with a duty to disclose, including named inventor Brian Cardineau, failed to disclose the Cardineau Paper and Cardineau Dissertation during prosecution of the application leading to the ’505 Patent. In the USPTO’s Notice of Allowance (mail room date of June 22, 2020), the examiner stated he was allowing the claims because the “particular first precursor and second precursor are not disclosed in the prior art.” The Cardineau Paper and the Cardineau Dissertation disclose and/or suggest these limitations, making them material prior art. *See* Ex. 3. Notwithstanding, named inventor Brian Cardineau did not cite either of these publications in an Information Disclosure Statement to the USPTO. The only reasonable inference from named inventor Brian Cardineau’s failure to disclose the Cardineau Paper and Cardineau Dissertation was that he intended to deceive the USPTO. Fact discovery may reveal other individuals with a duty to disclose knew of these references and their materiality, and withheld them with deceptive intent.[4]

As to the ’048 Patent, individuals with a duty to disclose, including named inventor Brian Cardineau, failed to disclose the Cardineau Paper and Cardineau Dissertation during prosecution of the application leading to the ’048 Patent. In the USPTO’s Notice of Allowance (mail room

[4] *See also SUNY* case D.I. 24-56 and D.I. 24-75 (showing that **Inpria** was aware of the Cardineau Paper, as well as its significance, as of at least **January 1, 2015**).

date of November 10, 2022), the examiner stated he was allowing the claims because the "the prior art does not explicitly teach the claim organotin composition comprising: a compound described by the formula $RSnX_3$, where R is an organic ligand with 1-31 carbon atoms and is bound to Sn with a metal-carbon bond and wherein X is selected from the group consisting of alkylamido or dialkylamido (—NR^1R^2, where R^1 and R^2 are independently hydrocarbon groups with 1-10 carbon atoms or hydrogen), siloxo (—$OSiR^1R^2R^3$, where R^1, $R^{2\prime}$ are independently hydrocarbon groups with 1-10 carbon atoms), silylamido (—$N(SiR^1{}_3)(R^2)$, where R^1 and R^2 are independently hydrocarbon groups with 1-10 carbon atoms), disilylamido (—$N(SiR^1{}_3)(SiR^2{}_3)$ where R^1 and R^2 are independently hydrocarbon groups with 1-10 carbon atoms), alkoxo and aryloxo (—OR, where R is an alkyl or aryl group with 1-10 carbon atoms), azido (—N_3), alkynido (—C≡CR, where R is a hydrocarbon group with 1-9 carbon atoms), amidato (—$NR^1(COR^2)$ where R^1 and R^2 are independently hydrocarbon groups with 1-7 carbon atoms or hydrogen), amidinato (—$NR^1C(NR^2)R^3$) where R^1 and R^2 are independently hydrocarbon groups with 1-8 carbon atoms or hydrogen), imido (—$N(COR^1)(COR^2)$, where R^1 and R^2 are independently hydrocarbon groups with 1-8 carbon atoms or hydrogen), or fluorinated analogues thereof, or combinations thereof." The Cardineau Paper and the Cardineau Dissertation disclose and/or suggest these limitations, making them material prior art. *See* Ex. 4. Notwithstanding, named inventor Brian Cardineau did not cite either of these publications in an Information Disclosure Statement to the USPTO. The only reasonable inference from named inventor Brian Cardineau's failure to disclose the Cardineau Paper and Cardineau Dissertation was that he intended to deceive the USPTO. Fact discovery may reveal other individuals with a duty to disclose knew of these references and their materiality, and withheld them with deceptive intent.

As to the ’081 Patent, individuals with a duty to disclose, including named inventor Brian Cardineau, failed to disclose the Cardineau Paper and Cardineau Dissertation during prosecution of the application leading to the ’081 Patent. In the USPTO’s Notice of Allowance (mail room date of August 1, 2023), the examiner stated he was allowing the claims because the “None of the prior art references disclose the claimed method as recited in claim 1 deposition a tin composition having organic ligands and hydrolysable ligands to form a coating with a dry thickness from about 1 nm to about 50 nm having the organic ligands as recited above wherein the composition is deposited by vapor deposition.” The Cardineau Paper and the Cardineau Dissertation disclose and/or suggest these limitations, making them material prior art. *See* Ex. 6. Notwithstanding, named inventor Brian Cardineau did not cite either of these publications in an Information Disclosure Statement to the USPTO. The only reasonable inference from named inventor Brian Cardineau’s failure to disclose the Cardineau Paper and Cardineau Dissertation was that he intended to deceive the USPTO. Fact discovery may reveal other individuals with a duty to disclose knew of these references and their materiality, and withheld them with deceptive intent.

As to the ’153 Patent, individuals with a duty to disclose failed to disclose the Cardineau Paper and Cardineau Dissertation during prosecution of the application leading to the ’153 Patent. The Cardineau Paper and the Cardineau Dissertation anticipate and/or render obvious each of Asserted Claims 11-16 and 18-21, making these references material prior art. *See* Exs. 16 and 17. Notwithstanding, no individual cited either of these publications in an Information Disclosure Statement to the USPTO. The only reasonable inference from this failure to disclose the Cardineau Paper and Cardineau Dissertation is deceptive intent. Fact discovery will reveal the individuals

with a duty to disclose that knew of these references and their materiality and withheld them with deceptive intent.

2. Improper Inventorship and Inequitable Conduct Due to Purposeful Omission of True Inventors

Inpria failed to identify the true inventors of the Asserted Patents to the USPTO during prosecution of its applications leading up to each of the Asserted Patents, for at least the same reasons raised in and/or as supported by at least the evidence cited in and/or attached to the complaint and first amended complaint filed in the *SUNY* case, all of which are hereby incorporated by reference. Specifically, Inpria misappropriated information received from faculty members and graduate students of the State University of New York – Albany to obtain issuance and ownership of each of the Asserted Patents. Fact discovery, as well as developments in the *SUNY* case, will reveal that Inpria omitted the identifies of the true inventors with the intent to deceive the USPTO so that it would be named as the sole owners of each of the Asserted Patents, and that inventorship is therefore not correctable, confirming that the Asserted Patents and Claims invalid under Pre-AIA § 102(f)/§ 101, and are further unenforceable due to improper inventorship and inequitable conduct. Pre-AIA 35 U.S.C. § 102(f) (providing that a person shall not be entitled to a patent if "he did not himself invent the subject matter sought to be patented."); *Cubist Pharm., Inc. v. Hospira, Inc.*, 75 F. Supp. 3d 641, 673 n. 14 (D. Del. 2014) (noting that after the passage of the AIA "proper inventorship remains a requirement of patentability through § 101"); *Trans-World Mfg. Corp. v. Al Nyman & Sons, Inc.*, 750 F.2d 1552, 1562 (Fed. Cir. 1984) (holding patent invalid under § 102(f) because inventorship error did not arise without deceptive intent and thus correction was not possible).

Dated: May 13, 2024

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on May 13, 2024, a copy of *Defendant's Initial Invalidity Contentions* was caused to be served via electronic mail upon the following counsel of record:

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