IN THE COURT OF CHANCERY OF THE STATE OF DELAWARE

RECOR MEDICAL, INC., a Delaware corporation,	:	
Plaintiff,	:	
v.	:	**C.A. No. 7387-VCN**
REINHARD WARNKING and SOUND INTERVENTIONS, INC., a Delaware corporation,	:	
Defendants.	:	

MEMORANDUM OPINION

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Date Decided: May 31, 2013
Revised: July 16, 2013

Daniel B. Rath, Esquire, Rebecca L. Butcher, Esquire, and K. Tyler O'Connell, Esquire of Landis Rath & Cobb LLP, Wilmington, Delaware, and John W. Holcomb, Esquire of Knobbe Martens Olson & Bear LLP, Riverside, California, Attorneys for Plaintiff.

Thomas M. Horan, Esquire of Womble Carlyle Sandridge & Rice, LLP, Wilmington, Delaware, and Joseph N. Campolo, Esquire and Eryn Y. Deblois, Esquire of Campolo, Middleton & McCormick, LLP, Bohemia, New York, Attorneys for Defendants.

NOBLE, Vice Chancellor

This is a dispute over the ownership of two patents that document the use of ultrasound in renal denervation—the process of damaging the sympathetic nerves surrounding the renal arteries—to treat hypertension. The first patent sets forth the proper application of ultrasound, by use of an ultrasound catheter inside the renal artery, at a specific intensity for a specific duration, for purposes of ablating the nerves located outside of the renal artery without affecting the tissue of the renal artery. This is accomplished by means of a concept called dosimetry. Dosimetry is the amount of power and time used to optimize the delivery of ultrasound energy. The second patent is functionally similar to the first patent, except that it describes a noninvasive procedure by which ultrasound energy is applied to the renal artery.

The dispute traces back to the plaintiff's acquisition of all the assets of an insolvent medical device company that, at the time of acquisition, was focused on developing a therapeutic treatment for mitral valve repair. Before their employment ended and before the acquisition closed, at least three senior employees (including the Chief Executive Officer) of the company began exploring the possibility of using ultrasound in renal denervation. A mere thirty days after his employment ended, the former CEO of the company filed two patents relating to the use of ultrasound energy to ablate the sympathetic nerves surrounding the renal artery. Armed with those two patents, the former employees

began a startup medical device company to develop therapeutic treatments for hypertension. After several years of developing the inventions and performing roughly forty animal studies, the startup company has now performed successful human clinical studies. Meanwhile, the plaintiff, while initially pursuing the development of the mitral valve devices it had acquired, also began exploring and developing applications for the use of ultrasound energy in renal denervation.

On the one hand, this case may be about a competing company attempting to stop a rival company from succeeding in the marketplace. At the time of the acquisition, the plaintiff neither knew about the assets it now seeks to obtain by court order, nor did it intend to pursue renal denervation. On the other hand, this case may also be about the faithful adherence to contractual obligations and the unremitting fiduciary duties that define the proper conduct of a fiduciary.

The plaintiff claims ownership over the two patents in dispute based on an invention assignment agreement, in which the former CEO explicitly agreed to assign any inventions he conceived of relating to the company's proprietary information. The plaintiff asserts that the two inventions became the assets of the insolvent company because he conceived of them before his employment ended, and because they relate to the company's proprietary information. If plaintiff's assertions are correct, it acquired the inventions pursuant to the asset purchase

agreement. Not surprisingly, the defendants—the former CEO and the startup company—vigorously dispute plaintiff's claims.

I. INTRODUCTION

Plaintiff ReCor Medical, Inc. ("ReCor") brings a declaratory judgment action and a fiduciary duty claim against Defendants Reinhard Warnking ("Warnking") and Sound Interventions, Inc. ("SII"). Through an asset purchase agreement (the "APA"), ReCor acquired all of the assets of ProRhythm, Inc. ("ProRhythm") on October 14, 2009. Warnking is the former CEO of ProRhythm, a medical device company which at the time of the acquisition was focused on developing treatments for mitral valve repair. His employment at ProRhythm terminated on September 30, 2009, just thirty days before he filed the two patent applications at issue in this case. Thereafter, Warnking, along with several former ProRhythm officers and employees, formed SII. ReCor requests that the Court: (1) declare that ReCor owns all right, title, and interest in the Patent Cooperation Treaty ("PCT") patent applications (the '772 patent application and the '757 patent application); (2) an injunction preventing the Defendants from making further use of the ultrasound technology disclosed in the patents; and (3) an order compelling

the Defendants to take all steps necessary to transfer to ReCor the PCT patent applications.[1] This is the Court's decision after trial.

II. BACKGROUND

These are the facts as the Court finds them after trial.

A. *The Parties & Notable Persons*

ReCor, formed in 2009, is a Delaware corporation with its principal place of business in Palo Alto, California.[2] The President and Chief Executive Officer of ReCor is Mano Iyer ("Iyer"), who is affiliated with Sofinnova Partners, ReCor's primary investor.[3]

Warnking was the President, Chief Executive Officer, and a director of ProRhythm until his employment at ProRhythm ended on September 30, 2009.[4] He had joined TranSurgical, Inc. ("TranSurgical"), the predecessor to ProRhythm, in 2001, and served in those capacities before and after TranSurgical changed its name to ProRhythm in 2003.[5] In his capacity as an employee of ProRhythm, Warnking executed an Employee Non-Disclosure, Non-Competition and Invention Assignment Agreement (the "IAA").[6]

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[1] Pre-Trial Stipulation & Order ("Pre-Trial Stip.") 6-7. ReCor also seeks an award of reasonable attorneys' fees and costs associated with this litigation. *Id.* at 7.
[2] *Id.* at 2.
[3] *Id.* at 2, 4.
[4] *Id.* at 3.
[5] *Id.*
[6] *Id.*; JX 4 (IAA).

SII is a Delaware corporation with its primary place of business in Stony Brook, New York.[7] Incorporated in August 2010, SII is in the process of commercializing ultrasound devices for renal denervation and the treatment of hypertension.[8] Warnking is the Chairman of the Board of SII and owns 25 percent of its stock.[9]

David Smith ("Smith") was ProRhythm's Vice President of Sales and Marketing and is now SII's President and Chief Executive Officer.[10] Yong Zou ("Zou") was also a ProRhythm employee before the acquisition. His work at ProRhythm included engineering research and product development. He now serves as the Director of Engineering at SII.[11] Dr. Yegor Sinelnikov ("Dr. Sinelnikov") was ProRhythm's Research and Development Manager and now serves as the Director of Research at SII.[12] Dr. Hiroshi Nakagawa ("Dr. Nakagawa"), a researcher at the University of Oklahoma, was employed by ProRhythm as a researcher and consultant.[13] He is currently employed by SII in a similar capacity.[14]

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[7] *Id.* at 2.
[8] *Id.* at 2.
[9] *Id.*
[10] *Id.*
[11] *Id.*
[12] *Id.* at 3.
[13] On January 1, 2008, ProRhythm and the University of Oklahoma, on behalf of Dr. Nakagawa, entered into a consulting agreement through which Dr. Nakagawa would provide consulting services to ProRhythm. *Id.*
[14] *Id.*

Before the acquisition, Jaime Merino ("Merino") was an engineer with ProRhythm. He is currently the Director of Engineering and Manufacturing at ReCor.[15]

B. *A Brief History of ProRhythm*

From its inception, ProRhythm focused on using ultrasound technology for various cardiovascular therapies. By 2008, and at the time ReCor acquired the assets of ProRhythm in October 2009, ProRhythm was primarily a mitral valve repair company.[16] Indeed, although ProRhythm had other assets, ReCor purchased ProRhythm in part because of its mitral valve repair device, which utilized an ultrasound catheter.[17] In addition to its mitral valve repair device, ProRhythm had explored and developed a number of ultrasound applications, many of which were intravascular or minimally invasive in nature, and all of which utilized ultrasound technology. Before 2008, ProRhythm had developed devices to treat atrial fibrillation, ventricular tachycardia, and chronic total occlusions.[18] With respect to noninvasive devices, ProRhythm had created an incision-less surgery device and a vasectomy device.[19] Like other ultrasound catheters, ProRhythm's ultrasound catheter employed the same generic components: (1) an ultrasound transducer,[20]

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[15] *Id.*
[16] Trial Tr. Vol. I at 213 (Warnking).
[17] *See* JX 111 (Iyer Dep.) at 71-72; Trial Tr. Vol. I at 24 (Iyer).
[18] Trial Tr. Vol. I at 142-44 (Merino).
[19] *Id.* at 144.
[20] A transducer transfers one form of energy into another.

(2) a balloon surrounding the transducer,[21] and (3) a generator to control the transmission of ultrasound energy.[22]

Due to a shortage of funds and the inability to raise additional funds, ProRhythm filed a Chapter 11 bankruptcy petition on December 11, 2007, in the United States Bankruptcy Court for the District of Delaware.[23] In 2008, Warnking had discussions with Sofinnova Partners regarding potential financing and, by early 2009, their discussions turned to high level conversations about a potential acquisition.[24] ReCor and ProRhythm executed the APA on August 31, 2009, and the deal closed on October 14, 2009. The employment of Smith, Warnking, Merino, and Zou terminated on September 30, 2009, but Merino, as well as six other ProRhythm employees,[25] were retained by ReCor.[26] Warnking also signed a Consulting Agreement with ReCor.

C. *The Use of Ultrasound for Renal Denervation*

Warnking became aware of renal denervation by at least late February 2009 when Smith forwarded an email to him from Dr. Raoul Bonan ("Dr. Bonan"). Along with Dr. Nakagawa, Dr. Bonan, of a Montreal research hospital, was a cardiovascular doctor who had worked with ProRhythm as a researcher. By

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[21] A balloon can be used to keep the energy source away from the vessel wall and to cool the ultrasound transducer. See JX 97 (Warnking Dep.) at 50.
[22] Trial Tr. Vol. I at 16-17 (Iyer). A generator controls the amount of energy released.
[23] Pre-Trial Stip. 3; *see* Trial Tr. Vol. I at 255-56 (Warnking).
[24] Pre-Trial Stip. 3.
[25] JX 111 (Iyer Dep.) at 52.
[26] Pre-Trial Stip. 3-4.

email, Dr. Bonan expressed interest to Smith about using ultrasound energy to denervate the renal nerves.[27] Smith forwarded that email to Warnking, stating: "he is probably thinking HIFU [*i.e.*, high-intensity focused ultrasound] is a better way to do this."[28] Roughly one month later, on March 24, 2009, Smith forwarded an email to Warnking which reported that Medtronic had made a $47 million investment in a new renal denervation company named Ardian.[29] Ardian had employed radio frequency ("RF") energy catheters to denervate the nerves surrounding the renal arteries for purposes of treating hypertension. The significant investment by Medtronic caused Smith to characterize renal denervation as a "serious idea."[30]

In the months that followed, Smith and Warnking continued to receive additional information about renal denervation. On April 1, 2009, Smith sent Warnking slides from a recent Ardian presentation.[31] On April 16, 2009, Smith sent an email to Zou with a technical description of a renal denervation procedure used by Ardian.[32]

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[27] JX 27 (email from Bonan to Smith). Zou also heard about the renal derivation idea from Dr. Bonan in early 2009. Trial Tr. Vol. II at 389 (Zou).
[28] *Id.*
[29] JX 33 (email from Smith to Warnking).
[30] *Id.*
[31] JX 39 (email from Smith to Warnking).
[32] JX 42 (email from Smith to Zou).

In a May 19, 2009, email to Dr. Bonan, Smith inquired about the possibility of adding some renal artery work at the end of an upcoming animal study.[33] At trial, Smith testified that he had no intention of conducting any renal denervation experiments; he was merely trying to motivate Dr. Bonan, who had not been paid for his previous work, was scheduled to present on behalf of ProRhythm at an upcoming conference, and had expressed interest in renal denervation.[34] Smith's testimony is curious. Although he may not have had an interest in doing renal denervation work with Dr. Bonan, ProRhythm's participation in a later renal denervation experiment with Dr. Nakagawa confirms that some of the employees at ProRhythm had the intention—by late spring or early summer of 2009—of exploring renal denervation. Later, in a June 24, 2009, email from Warnking to Dr. Bonan, Warnking apologized "for not getting around to the renal denervation experiments."[35] Warnking then promised to do a renal denervation study "during one of the upcoming training sessions."[36] At trial, Warnking testified, as Smith did, that he had no intention of doing renal denervation work: "I tried to keep Dr. Bonan motivated to stick with our mitral valve experiments because we had financial problems. We were behind paying his hospital."[37]

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[33] JX 44 (email from Smith to Bonan).
[34] Trial Tr. Vol. II at 452-53.
[35] JX 49 (email from Warnking to Bonan).
[36] *Id.*
[37] Trial Tr. Vol. I at 218.

By early June, Dr. Nakagawa was also expressing interest in renal denervation and discussing the same with Warnking.[38] In an email to Warnking, Dr. Nakagawa wrote: "Enclosed is a manuscript of catheter ablation of renal sympathetic nerve plexi to treat resistant hypertension. I believe that ultrasound ablation catheter . . . will be much better than RF catheter. Are you interested in this project?"[39] In a June 9 email responding to Dr. Nakagawa, Warnking informed him of the potential asset sale to a French venture capital group (*i.e.*, ReCor) and explained, with respect to the renal denervation project, that "we cannot do anything right now since it looks like if [ReCor] is successful in buying the [mitral valve] assets the rest of ProRhythm Inc will be liquidated. . . . Any new development we would start now would just be sold in the liquidation."[40] Curiously, Warnking then forwarded his response to Dr. Nakagawa to Dr. Sinelnikov, Zou, and Smith,[41] stating: "Just FYI; so you say the same thing."[42]

Warnking's words "so you say the same thing" are significant. Warnking testified that he wanted to keep ProRhythm focused on the mitral valve repair work in hopes that a successful human clinical study would pull the company out of

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[38] Indeed, according to Warnking, "physicians were pushing for ultrasound because everyone was excited about renal denervation." JX 97 (Warnking Dep. Tr.) at 175.
[39] JX 45 (email from Nakagawa to Warnking).
[40] *Id.*
[41] The email was mistakenly sent to David Cichy, who was the chief financial officer at ProRhythm. Zou forwarded the email to Smith, stating: "It should have been to DS [*i.e.*, David Smith]." JX 46 (email from Zou to Smith).
[42] JX 45.

bankruptcy.[43] However, when he wrote this email, Warnking seemed to appreciate ReCor's inevitable acquisition of ProRhythm's assets and the resulting consequences. In fact, at trial, Warnking testified that, as of about June 2009, he had told all ProRhythm employees that the company would not make it out of bankruptcy and that they should begin looking for new employment.[44] Warnking was also thinking about what to do next. He testified at trial: "I was still prepared to start a mitral valve company. That was my plan after ProRhythm."[45]

By this time, the idea of using an ultrasound catheter for renal denervation was percolating among ProRhythm's employees and consultants. This fact is further confirmed by the renal denervation experiment that was performed on June 27, 2009, which is discussed below. Although Warnking and other ProRhythm employees have suggested that the company's dire financial situation prohibited any renal denervation experiments, their testimony is undermined by the relative ease with which such an experiment was added to the June 27 animal study.[46] Indeed, in light of Warnking, Smith, and Zou's subsequent conduct, there is a serious question as to whether they deliberately attempted to conceal this opportunity from the ProRhythm board and ReCor in order to allow them to pursue this opportunity on their own.

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[43] JX 97 (Warnking Dep.) at 187-91; Trial Tr. Vol. I at 256 (Warnking).
[44] Trial Tr. Vol. I at 229-30 (Warnking).
[45] *Id.* at 230.
[46] See Trial Tr. Vol. II at 374 (Nakagawa) (noting that the renal denervation portion of the June 27 study did not have an additional cost).

D. *The June 27, 2009 Renal Denervation Experiment*

The June 27, 2009, experiment performed at the University of Oklahoma provides the basis for some of the most serious factual disagreements in the record—and for good reason—because the dispute centers around who owns the renal denervation portion of the experiment. Nonetheless, there are many undisputed facts relating to the study. It is undisputed that Dr. Nakagawa, on behalf of ProRhythm, performed a lengthy dog study involving a treatment for mitral valve repair. At the conclusion of the mitral valve experiment, Dr. Nakagawa, with the assistance of Zou, conducted a thirty to forty-five minute renal denervation experiment using ProRhythm's touch-up catheter.[47] Importantly, the touch-up catheter used was different from the mitral valve catheter that had been used during that portion of the experiment. It is also undisputed that during the renal denervation portion of the dog study, Dr. Nakagawa performed three separate tests on the renal arteries. Each test appeared to be designed to measure how different amounts of ultrasound energy would affect the nerves surrounding the renal artery.[48] Specifically, Dr. Nakagawa inserted ProRhythm's touch-up catheter into the dog's renal artery, which had the effect of ablating the dog's renal nerve

[47] Trial Tr. Vol. II at 325-27 (Nakagawa); *see* Pre-Trial Stip. 4.
[48] JX 51 (experimental data sheet) at 6; Trial Tr. Vol. II at 338-40.

and renal artery tissue.[49] As is typical following animal studies, the dog was sacrificed and Dr. Nakagawa resected the renal arteries and kidneys. He then preserved them for a histo-pathology analysis.[50] Although the histology reports were expected to be back much sooner, they did not become available until December 14, 2009. Dr. Nakagawa transmitted the histo-pathology results from both the mitral valve and renal denervation experiments to Warnking, Smith, and Zou, all of whom had, by this time, started SII.

The Defendants contend that the June 27 renal denervation experiment was an "ad hoc" study that was not authorized by ProRhythm. Indeed, Dr. Nakagawa testified at trial that it was his idea "totally independent from ProRhythm" to perform the renal denervation experiment and that ProRhythm deferred to his curiosity.[51] The Defendants further assert that the experiment falls within the ambit of University Intellectual Property as defined by the Research Agreement between the University of Oklahoma and ProRhythm.[52] Warnking testified that he

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[49] Trial Tr. Vol. II at 327; Pre-Trial Stip. 17. The parties stipulated that Dr. Nakagawa used an ultrasound catheter in the renal artery of the subject animal and that the catheter used was the property of ProRhythm. According to Dr. Nakagawa, the experiment was inconclusive, almost negative, in the sense that the renal nerves sustained only minor damage. Trial Tr. Vol. II at 333, 347.

[50] JX 103 (Nakagawa Dep. Tr.) at 41. Histo-pathology is the study of tissue and cells at the cellular level. It provides an analysis of how a treatment affected tissue at a cellular level. Trial Tr. Vol. I at 31 (Iyer).

[51] Trial Tr. Vol. II at 327-28, 358.

[52] JX 5 (Research Agreement) §§ 1.3, 8.1. The Defendants also argue that renal denervation falls outside the scope of Dr. Nakagawa's Consulting Agreement with ProRhythm. See JX 15 (Consulting Agreement). While the Consulting Agreement does not mention renal denervation,

was not present for the renal denervation portion of the experiment, and was not even aware of the experiment until several months after it occurred.[53]

ReCor, of course, argues the opposite. It contends that the renal denervation portion of the study was ProRhythm's property because the study was paid for by ProRhythm, ProRhythm employees participated in the study, and, perhaps most importantly, Dr. Nakagawa provided the histo-pathology reports to the former officers of ProRhythm.

The Court finds that the renal denervation portion of the June 27 study was the property of ProRhythm. The weight of the evidence compels that finding. First, the renal denervation portion of the study, including the histo-pathology report, was paid for by ProRhythm.[54] Dr. Nakagawa used ProRhythm's touch-up catheter, which was a different catheter from the one used during the mitral valve portion of the study.[55] Moreover, the notes of the mitral valve portion of the study and the notes of the renal denervation portion of the study were kept together on the same data sheet.[56] Zou, a ProRhythm employee, participated in the renal denervation portion of the experiment. As important, Dr. Nakagawa sent the results of the renal denervation experiment to the former employees of ProRhythm.

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that is not dispositive as to ownership of the experiment. In any event, it appears that the Research Agreement governed the June 27 experiment.

[53] Trial Tr. Vol. II at 310 (Warnking).

[54] Trial Tr. Vol. II at 364-65.

[55] Trial Tr. Vol. II at 327 (Nakagawa).

[56] JX 51 (experimental data sheet).

Second, the preponderance of the evidence suggests that this was not an "ad-hoc" study conducted and authorized independently of ProRhythm by Dr. Nakagawa. Dr. Atsushi Ikeda ("Dr. Ikeda"), the assistant to Dr. Nakagawa, was notified beforehand about the renal denervation portion of the study so that he could properly prepare and set up for the experiment.[57] Furthermore, Zou, who provided the catheter to Dr. Nakagawa to use in the mitral value portion of the study, may have also planned in advance to bring the touch-up catheter for the renal denervation study.[58] During or after the study, Zou prepared an animal case report setting forth the details of the test.[59] Indeed, Dr. Ikeda emailed Zou on July 8 asking: "What was the power and time for renal artery ablations?"[60] Zou responded on July 10: "The power and time were 40wx10s, 40wx20s, and 40wx30s."[61]

Third, the testimony of Warnking and Dr. Nakagawa relating to the June 27 study is less than credible. In his deposition, Dr. Nakagawa testified that he sent the histo-pathology reports to the former ProRhythm employees because it was their (*i.e.*, ProRhythm's) "top secret" information. He explained that he did not

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[57] Trial Tr. Vol. II at 384 (Ikeda).
[58] *See* Trial Tr. Vol. I at 172 (Merino). The Defendants dispute whether Zou brought the touch-up catheter with him or whether Dr. Nakagawa used a ProRhythm catheter that he already had in his possession.
[59] JX 50 (animal case report).
[60] JX 54 (email from Ikeda to Zou).
[61] JX 55 (email from Zou to Ikeda).

send the information to ReCor because he did not have a contract with ReCor,[62] notwithstanding that Dr. Nakagawa had been told by Warnking and Iyer that ReCor was purchasing or had purchased all of the assets of ProRhythm.[63] At trial, Dr. Nakagawa retreated from his previous testimony which he had made under oath. Although he had described the results of the study—including both the mitral valve and renal denervation portions—as the "top secret" information of ProRhythm, Dr. Nakagawa at trial claimed that the renal denervation portion of the study was his experiment.[64] When asked if he sent the results of the renal denervation portion of the study to Warnking, he testified: "Yes, eventually, I did, but that's my *personal stuff*."[65] Dr. Nakagawa's interest in the outcome of this case includes more than his employment as a consultant to SII: he owns a substantial amount of stock in SII.[66]

Notwithstanding Warnking's testimony to the contrary, the Court finds that Warnking was likely present during the *entire* June 27 dog study. The testimony regarding Warnking's presence at the study is peculiar. Warnking denies knowing

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[62] Trial Tr. Vol. II at 361-62 (Nakagawa Video Deposition Played); *see also* JX 103 (Nakagawa Dep.) at 28.
[63] JX 71 (email from Iyer to Nakagawa); Trial Tr. Vol. II at 356 (Nakagawa).
[64] To be complete, during his deposition Dr. Nakagawa was asked by his attorney: "Were you asked or directed by anyone at ProRhythm to conduct this renal experiment?" He responded: "No." JX 103 (Nakagawa Dep.) at 146.
[65] Trial Tr. Vol. II at 362-63 (Nakagawa) (emphasis added). His testimony, of course, does not technically square with the Defendants' theory that the June 27 study was the property of the University of Oklahoma.
[66] JX 93 (Nakagawa's Stock Agmt.).

about the renal denervation portion of the study until months after it occurred, but admits that he traveled to Oklahoma and attended the mitral valve portion of the experiment even though he concedes that the mitral valve study would not have caused him to attend.[67] By then, mitral valve experiments were routine, and so Warnking admits that he must have been in Oklahoma for some other reason, but cannot recall what the reason may have been.[68] Zou and Dr. Ikeda both testified that they do not remember whether Warnking was even present at any portion of the June 27 experiment or even traveled to Oklahoma.[69]

Nonetheless, Warnking's presence in Oklahoma and at the study is corroborated by an expense report and a case report indicating that he traveled to Oklahoma and was present during the study.[70] Given the general interest surrounding renal denervation and that, by this time, both Dr. Nakagawa and Dr. Bonan were repeatedly saying that ultrasound was better for renal denervation than RF, it is doubtful that Warnking would attend the mitral valve portion of the study, which was routine by then, and then subsequently leave before the renal denervation portion of the study began. Equally perplexing is how Warnking could not have known about the renal denervation experiment when it was performed, given Zou's participation in the experiment. Warnking could not recall

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[67] Trial Tr. Vol. I at 219-21 (Warnking).
[68] *Id.*
[69] JX 103 (Nakagawa Dep.) at 34, JX 104 (Ikeda Dep.) at 39-40; JX 98 (Zou Dep.) at 76-77.
[70] JX 50 (Animal Case Report); JX 52 (Expense Report).

why he was in Oklahoma—but it is more likely than not that he was there to attend the renal denervation experiment.

After carefully considering all the evidence presented at trial, the Court is convinced that it is more likely than not that the renal denervation portion of the June 27 study is the property of ProRhythm. As such, the results of the study were assets of ProRhythm that were acquired by ReCor through the APA. Even though the histo-pathology analysis was not completed until December, Dr. Nakagawa should have transmitted the results to ReCor.

E. *A New Project*

As ProRhythm neared being stripped of all its assets, ProRhythm employees naturally began thinking about what to do next. On August 21, 2009, Zou emailed Jung, a former employee of ProRhythm, stating: "I really liked the reno devervation [*i.e.*, renal denervation] project and I want to pursue that one if I get a chance. I don't know how much [Dr. Nakagawa] has told you, the denervation procedure is much easier than thought."[71] Indeed, Zou also testified in his deposition that the June 27 study showed that it was "probably easy for us to pursue" renal denervation, referring to the engineers at ProRhythm.[72] Jung had sent an email to Smith and Warnking in early July describing what Dr. Nakagawa had informed him about Ardian's renal denervation work. He wrote that

[71] JX 63 (email from Zou to Jung).
[72] Trial Tr. Vol. II at 393 (video clip of Zou's deposition).

Dr. Nakagawa had told him that "given HIFUs non-interaction with blood and its effectiveness at damaging nerves . . . he can think of no better energy form than HIFU to treat hypertension."[73]

Zou also sent an email to Jung on August 31, 2009, inquiring: "You mentioned last time that you might be able to get some funding for the denervation project? What does it take?"[74] A month later, Jung responded: "So what's going on? Anything on denervation?"[75] Zou forwarded that email to Smith and Warnking, asking how he should respond. Smith replied: "I wouldn't share much with him at this time. He has too many resources at his disposal to do this himself."[76]

In regard to Warnking, his desire to pursue renal denervation was initially more measured. Before August 24, 2009, when Warnking signed a Consulting Agreement with ReCor, Warnking testified that he still had hopes of starting a mitral valve company. In Zou's August 21, 2009, email to Jung, he wrote, "I have a feeling that [Warnking] and [Merino] are on board with [ReCor], the prospect of starting something new with RW [*i.e.*, Warnking] is getting dimmer."[77]

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[73] JX 53 (email from Jung to Smith & Warnking).
[74] JX 67 (email between Zou and Jung).
[75] *Id.* (email from Jung to Zou).
[76] *Id.* (email from Smith to Zou). It is clear that, by early September, Warnking, Smith, and Zou had decided to pursue renal denervation jointly.
[77] JX 63 (Zou email to Jung).

However, once Warnking signed the Consulting Agreement, he began to explore the renal denervation idea in more depth. Pursuant to the Consulting Agreement, Warnking was retained as an independent contractor to provide "consulting services" in connection with ReCor's acquisition of all of ProRhythm's assets.[78] Warnking testified at trial that by signing the Consulting Agreement he was blocked out of doing any further mitral valve work, and as a result, he began exploring other alternative ideas, including renal denervation.[79] On September 1, 2009, Dr. Nakagawa advised Warnking that he would "get the histology from the dog which we ablated the renal artery by this weekend."[80] A week later, Warnking replied to that email, asking, "What did the renal histology suggest? In order to move forward with this we could use some positive news."[81] Warnking also obtained employment with a company called Sonavation on November 1, 2009.[82]

As for Smith, he testified that he was very interested in pursuing ultrasound renal denervation work as of August 2009 and tried to convince Warnking to start

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[78] JX 64 (Consulting Agreement).
[79] Trial Tr. Vol. I at 265-68 (Warnking).
[80] JX 68 (email from Nakagawa to Warnking).
[81] *Id.* (email from Warnking to Nakagawa).
[82] Trial Tr. Vol. I at 251-52 (Warnking). Sonavation is an entirely separate company from SII. As of March 2012, Warnking was employed as president of the medical division of Sonavation. JX 97 (Warnking Dep.) at 64.

a company with him. Smith also sought to recruit Zou.[83] In the meantime, he did some consulting work immediately after his employment at ProRhythm.[84]

F. *The Sabbatical Period*

Under the Consulting Agreement, Warnking was given approximately one-month from the closing date of the transaction to when he would begin working as a consultant for ReCor (the "Sabbatical Period")[85] to create or develop an "Invention."[86] And that is what he did. Thirty days after Warnking's employment at ProRhythm ended, he filed, without conducting any experiments, two provisional patent applications for two ultrasound renal denervation therapies.[87] One of the patent applications covers the delivery of ultrasound energy using a minimally invasive catheter (the "'429 patent application")[88] and the other application is a noninvasive procedure in which ultrasound energy is delivered extracorporeally (the "'455 patent application")—the energy is delivered from

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[83] Trial Tr. Vol. II at 455 (Smith).
[84] JX 105 (Smith Dep.) at 16.
[85] JX 64 (Consulting Agreement).
[86] *Id.* Notably, the provision states: "anything created or developed by Consultant during the Sabbatical Period shall not be an "Invention" (as defined in Section 4.A), except if same is created or developed by Consultant during the Sabbatical Period using Company's Confidential Information . . . ." *Id.* at § 2(b).
[87] The two patent applications are Application No. 61/256,429 (the "'429 patent application") and Application No. 61/256,455 (the "'455 patent application"). Pre-Trial Stip. 4.
[88] JX 72 ('429 application).

outside the body.[89] In the minimally invasive patent, Warnking claims that he had invented:

> [A] method of ablating renal nerves from inside the renal artery . . . [that] desirably include[s] the step of positioning an emitter unit, which includes an ultrasonic transducer desirably having a cylindrical shape, in proximity to the kidney inside the renal artery. The transducer may be actuated to generate ultrasonic energy that may damage renal nerves surrounding the renal artery without causing necrosis of surrounding tissue.[90]

Warnking converted his '429 patent application into a formal PCT patent application a year later. In that later application, his first claim was:

> 1. Apparatus for inactivating renal nerve conduction in a mammalian subject comprising:
>
> an ultrasound transducer adapted for insertion into a renal artery of the mammalian subject and for transmitting unfocused ultrasound energy; and
>
> an actuator electrically connected to the transducer, the actuator being adapted to control the ultrasound transducer to transmit unfocused ultrasound energy into an impact volume of at least approximately 0.5 cm^3, encompassing the renal artery so that the unfocused ultrasound energy is applied at a therapeutic level sufficient to inactivate conduction of renal nerves throughout the impact volume.[91]

According to Warnking, dosimetry is the inventive aspect of his patents. As applied to renal denervation, dosimetry is performed by setting the power level and the timing and delivery of the power such that the ultrasound energy will necrose

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[89] JX 73 ('455 application).
[90] JX 72 at 18.
[91] JX 91 ('757 PCT application) at 24.

the renal nerves without affecting the surrounding tissues.[92] ProRhythm had utilized the concept of dosimetry in various ultrasound applications before the acquisition, although the power levels for each application were generally higher than the power levels used in renal denervation.[93] Similarly, Warnking's '455 patent application, which contemplated the application of ultrasound energy from outside the body into the patient, was also a technique that had been utilized at ProRhythm, albeit to a lesser extent.

When Warnking was asked what he did in order to be able to file the patent applications, he replied that he studied the Ardian patents after his employment at ProRhythm ended.[94] From his reading of the Ardian patents, he realized that there was "space" in which he could file patents regarding the use of ultrasound in renal denervation. According to Warnking, this "aha" moment came to him when he was reviewing the Ardian patents.

In mid-October, while Warnking was apparently working on his patent applications, he attended a cardiovascular conference in Philadelphia with Zou, Smith, and Dr. Nakagawa.[95] Among other things, they discussed moving forward

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[92] Trial Tr. Vol. I at 154 (Merino).
[93] Trial Tr. Vol. I at 154-56 (Merino).
[94] Trial Tr. Vol. I at 267-68 (Warnking). Warnking testified that he was too busy during the "last days when the APA was signed" to have researched the Ardian patents before his employment ended. *Id.*
[95] Trial Tr. Vol. II at 363-64 (Nakagawa); *id.* at 456-57 (Smith).

with renal denervation.[96] Also during October, Smith began putting together a structure for the new company.[97]

G. *Sound Interventions is Formed*

Although SII was not incorporated until some time later,[98] by the first week of December 2009, Warnking, Smith, and Zou had, in essence, established SII as a new company and located office space to rent in Stony Brook, New York, which they officially moved into during January 2010.[99] Dr. Nakagawa joined SII as a scientific advisor, and received shares in the new company.[100] In that capacity, Dr. Nakagawa produced an animal study plan for additional studies on ultrasound renal denervation.[101]

Dr. Nakagawa received the histo-pathology reports from the June 27 study in mid-December 2009.[102] He did not send the results to ReCor even though he was aware that it had acquired all the assets of ProRhythm.[103] Instead, Dr. Nakagawa forwarded the histo-pathology reports to Smith, who eventually included a portion of the renal denervation study in a draft SII presentation to

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[96] Trial Tr. Vol. II at 456-57 (Smith).
[97] *Id.*
[98] JX 105 (Smith Dep.) at 16.
[99] *Id.* at 458-59 (Smith).
[100] JX 75 (email from Nakagawa to Smith); Trial Tr. Vol. II at 457-58; JX 93 (stock option agreement).
[101] JX 79 (email from Smith to Nakagawa).
[102] Trial Tr. Vol. II at 356-57 (Nakagawa).
[103] JX 71 (email from Iyer to Nakagawa).

investors.[104] Although Smith claimed that he was "not sure that it went to anybody,"[105] Smith emailed Dr. Nakagawa on August 5, 2010, to inform him that a potential investor in SII "may also want to know about the *one animal experiment that we did*"—referring to the June 27 experiment.[106]

On January 6, 2010, Warnking filed a third provisional patent application (the "'618 Application") that related to the '429 patent application.[107] On October 8, 2010, Warnking assigned to SII the '429, '455, and '618 patent applications.[108]

III. ANALYSIS

This section addresses whether Warnking's inventions were transferred to ReCor under the APA. In order to show that Warnking's ideas were assets of ProRhythm, ReCor must establish by a preponderance of the evidence (1) that Warnking conceived of his inventions while employed at ProRhythm; and (2) that his inventions relate to ProRhythm's Proprietary Information—as defined by the IAA. Because the parties dispute the meaning of the word "conceive," the Court will address that issue first. The Court then will examine whether Warnking

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[104] JX 78 (PowerPoint slides).
[105] JX 105 (Smith Dep. Tr.) at 80-81.
[106] JX 82 (email from Smith to Nakagawa) (emphasis added).
[107] Pre-Trial Stip. 4. This patent application is Application No. 61/292,618. Warnking testified in his deposition that the '618 application is essentially identical to the '429 patent application. According to Warnking, it was filed only to "stress the dosimetry idea or make that a little more clear." JX 97 (Warnking Dep.) at 77-78.
[108] Pre-Trial Stip. 4.

actually conceived of his inventions while employed at ProRhythm. Finally, the Court will determine whether Warnking's inventions became assets of ProRhythm under the IAA.

To prevail on its claims, ReCor must show by a preponderance of the evidence that it is entitled to the relief it requested. "Proof by a preponderance of the evidence means proof that something is more likely than not. It means that certain evidence, when compared to the evidence opposed to it, has the more convincing force and makes you believe that something is more likely true than not."[109]

A. *The Asset Purchase Agreement*

The Defendants do not dispute that ReCor acquired all of the assets of ProRhythm pursuant to the APA.[110] The relevant provision, Section 2.01, states: "Seller shall, at the Closing, sell, transfer, assign, convey and deliver to Buyer . . . all of Seller's right, title and interest, as of the Closing Date, in and to the Transferred Intellectual Property . . . ." [111] Section 2.01(c) of the APA further provides that ReCor would acquire "[a]ny claims, lawsuits or rights to recovery by Seller in connection with the Acquired Assets and arising out of or relating to

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[109] *Del. Express Shuttle, Inc. v. Older*, 2002 WL 31458243, at *17 (Del. Ch. Oct. 23, 2002) (internal quotation marks omitted).

[110] Warnking conceded that: "[w]hatever was left in ProRhythm's estate was transferred to ReCor." Trial Tr. Vol. I at 227-28. The APA is governed by Delaware law. JX 65 (APA) § 11.10.

[111] JX 65 (APA) §§ 2.01, 1.01(j), 1.01(u).

events, circumstances or occurrences that took place or existed prior to the Closing Date . . . ."[112] The latter provision forms the basis for ReCor's fiduciary duty claim,[113] while the former provision provides the basis for ReCor's declaratory judgment action.[114]

B. *The Invention Assignment Agreement*[115]

Because the IAA is governed by New York law,[116] New York contract interpretation principles apply. "In interpreting a contract, 'the document must be read as a whole to determine the parties' purpose and intent, giving a practical interpretation to the language employed so that the parties' reasonable expectations

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[112] JX 65 (APA) § 2.01(c).

[113] ReCor acquired the right to assert "any claims, lawsuits, or rights" that ProRhythm had at the time of the acquisition. *See Am. Home Products Corp. v. CAMBR Co., Inc.*, 2001 WL 79903, at *1, 3 (S.D.N.Y. Jan. 30, 2001) (holding that an asset purchase agreement which included the "Seller's rights, claims, credits, causes of action or rights of set-off against third parties" was sufficient to transfer an unknown antitrust claim from seller to buyer).

[114] If this is incorrect, ReCor has standing to pursue its declaratory action because it has the right to assert any claims that ProRhythm had under the IAA at the time of the acquisition.

[115] Invention assignment agreements between employer and employee are permitted under Delaware law "so long as the inventions to be assigned are related to the employer's business or result from work performed by the employee for the employer." *Agilent Techs., Inc. v. Kirkland*, 2010 WL 610725, at *15 (Del. Ch. Feb. 18, 2010); *see also* 19 *Del. C.* § 805. Notwithstanding an assignment agreement, "an employee may freely use knowledge that is fully available in her field of work, even if that knowledge is acquired during her employment." *Agilent Techs., Inc.*, at *15; *see also SinoMab Bioscience Ltd. v. Immunomedics, Inc.*, 2009 WL 1707891, at *16 (Del. Ch. June 16, 2009).

[116] JX 4 (IAA) § 11.

are realized.'"[117] Furthermore, a "contract should not be interpreted in such a way as to leave one of it[s] provisions substantially without force or effect."[118]

ReCor contends that it acquired Warnking's inventions because they were ProRhythm assets under the APA. According to ReCor, Warnking's inventions became the assets of ProRhythm by Section 2(a) of the IAA because he conceived of them before his employment at ProRhythm ended. Warnking signed the IAA upon joining ProRhythm. The relevant provision—Section 2(a)—provides:

> If at any time . . . during my employment I . . . make, *conceive*, discover, or reduce to practice any *Proprietary Information whatsoever or any interest therein* (whether or not patentable) . . . that (i) relates to the business of the Company . . . such Developments and the benefits thereof shall immediately become the sole and absolute property of the Company and its assigns . . . .[119]

Importantly, this provision uses the word conceive, which as explained below, is a term that reasonably encompasses any idea grasped by one's mind. The provision also modifies the defined term Proprietary Information with the words "whatsoever or any interest therein (whether or not patentable)." By its plain terms,

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[117] *Queens Best, LLC v. Brazal S. Hldgs., LLC*, 826 N.Y.S.2d 684 (N.Y. App. Div. 2006) (quoting *Snug Harbor Sq. Venture v. Never Home Laundry, Inc.*, 675 N.Y.S.2d 365 (N.Y. App. Div. 1998)).
[118] *Queens Best, LLC*, 826 N.Y.S.2d at 684.
[119] JX 4 (IAA) § 2(a) (emphasis added).

Section 2(a) compels a broad interpretation of what constitutes the application of Proprietary Information.[120]

The defined term Proprietary Information also encompasses a broad range of items.[121] It includes:

> Intellectual Property Rights . . ., trade secrets or proprietary or confidential information respecting inventions, products, product plans, designs . . . methods, know-how, techniques, technology . . . in whatever form, tangible or intangible or other materials of any nature relating to any matter within the scope of the business of the Company or concerning any of the dealings or affairs of the Company.[122]

Thus, any invention, method, or technology that relates to ProRhythm's proprietary or confidential information and is within the scope of ProRhythm's business becomes Proprietary Information. Notably, Intellectual Property Rights is also a defined term in the definition of Proprietary Information. As set forth in Section 1(b), the term Intellectual Property Rights is defined as "all industrial and intellectual property rights, including, without limitation, patents, patent applications, patent rights, trademarks . . . know-how, trade secrets, . . . [and] inventions . . . ."[123]

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[120] At his deposition, Warnking characterized the content of the IAA as: "Any inventions I'll make or I make while employed by TranSurgical/ProRhythm belong to TranSurgical/ProRhythm." JX 97 (Warnking Dep.) at 117.

[121] The term Proprietary Information is found in Section 1(a), which states: "I will not at any time, whether during or after the termination of my employment, reveal to any person or entity any of the trade secrets or proprietary or confidential information of the Company or of any third party which the Company is under an obligation to keep confidential . . . ."

[122] JX 4 (IAA) § 1(a).

[123] IAA § 1(b).

C. *What is the Proper Meaning of the Word "Conceive"?*

Before addressing the question of when Warnking conceived of his inventions, the Defendants have argued that the word "conceive" is defined by patent law as the "disclosure of an invention which enables one skilled in the art to reduce the invention to a practical form without 'exercise of the inventive faculty.'"[124] The Defendants seek to impose this higher standard of proof on ReCor in establishing when Warnking conceived of his inventions. In response, ReCor asserts that the Court need not wrestle with whether Warnking's inventions were patentable, nor is it limited by how patent law defines conception.

ReCor is correct. This is not a patent case. It is a contract dispute that requires the Court to interpret both the IAA and APA. The relevant provisions of the IAA refer to both patentable and non-patentable items. Patent law might inform the Court's interpretation of the relevant contracts, but absent a contractual stipulation to that effect or some other indication that the parties intended for patent law to operate exclusively, the Court can see no reason why patent law should displace contract law here.

Indeed, in *AT&T*,[125] which addressed the very same argument that the Defendants postulate here,[126] the court held that the "contract may have used

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[124] Defs.' Reply to Pl.'s Opening Post-Trial Br. ("Defs.' Reply Br.") 19; *Gunter v. Stream*, 573 F.2d 77, 79 (C.C.P.A. 1978).

[125] *Am. Tel. & Tel. Co. v. Integrated Network Corp.*, 972 F.2d 1321 (Fed. Cir. 1992).

conception in its generic, broadest sense."[127] Reasoning that "there is no reason to assume it meant to cover only [inventions] which are patentable," the court noted that the language could include "unpatentable inventions" and "when an invention was conceived may be more a question of common sense than of patent law."[128] Moreover, in contrast to Section 2(a), the invention assignment clause in *AT&T* did not include the words "whether or not patentable."

As demonstrated, this broad definition of conception is consistent with the plain language of the IAA. Furthermore, the definition of Intellectual Property Rights in Section 1(a) differentiates between inventions and patents. Thus, that clause reasonably contemplates that inventions are different from and broader than patent rights, which is consistent with Section 2(a). Accordingly, the Court is not limited by how patent law defines conception, nor must ReCor show that the inventions were reduced to practice or otherwise patentable.[129]

D. *When Did Warnking Conceive of His Inventions?*

The Defendants contend that Warnking's inventions never became assets of ProRhythm because Warnking did not conceive of them or reduce them to practice

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[126] The district court had previously held that the "conception of inventions, as used in the employment agreement, is solely a technical question of patent law." *Id.* at 1324.
[127] *Id.*
[128] *Id.* The Defendants attempt to distinguish *AT&T* by arguing that it involved a breach of contract claim, while, here, there is no breach of contract claim because ReCor did not expressly adopt the IAA in the APA. This is not a meaningful distinction.
[129] The Court expresses no opinion as to whether the patent applications filed by Warnking support the award of any patent.

while employed at ProRhythm.[130] Warnking testified that he conceived of the inventions only after he thoroughly reviewed the Ardian patents and reduced them to practice when he filed the patent applications on October 30, 2009.[131] More specifically, with respect to the Ardian patents, Warnking testified: "I got excited about renal denervation when I studied the Ardian patents and discovered that they are totally academic as far as ultrasound is concerned. You cannot visualize nerves, and, therefore, you cannot work with geometric focusing."[132] While the Ardian patents had disclosed the possible use of focused or unfocused ultrasound,[133] when Warnking saw their "ultrasound approach," he realized there was a "hole" or "space" in which to file a patent. As he explained at trial:

> [Ardian] wanted to save the artery by having the artery in the unfocused portion of the beam and the nerve in the focal point or focal right or focal line. But that is purely academic because I knew from my university studies that nerves are so small, you cannot image them, neither with MRI or CT or ultrasound.[134]

In other words, Warnking conceived of an approach different from Ardian's approach for using ultrasound to do renal denervation, one that he believed was much better. The question is when did he conceive of that different approach:

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[130] The Defendants point out that, with the exception of the June 27 experiment, no renal denervation was performed at ProRhythm. Trial Tr. Vol. I at 172-173 (Merino). Iyer also testified that he was not aware that Dr. Bonan performed renal denervation research on behalf of ProRhythm. Trial Tr. Vol. I at 115 (Iyer).
[131] Defs.' Post-Trial Br. ("Defs.' Br.") 15.
[132] Trial Tr. Vol. I at 281 (Warnking).
[133] JX 74 (Ardian Patent) at 22 & JX 81 (Ardian Patent) at 29.
[134] Trial Tr. Vol. I at 279 (Warnking).

before his employment at ProRhythm expired, as ReCor asserts, or when Warnking reviewed the Ardian patents, as the Defendants contend?

ReCor asserts that this case is analogous to *General Signal Corp. v. Primary Flow Signal, Inc.*[135] In that case, a former employee of GSC, recorded the "conception of a universal flow meter" five days after his invention assignment agreement expired, which he had signed as an employee of GSC, and which obligated him to assign over any invention or idea.[136] The court ordered the former employee to assign the invention at issue to his former employer because the "concept . . . must have existed in [his] mind before his employment with GSC ended."[137] In finding that the former employee had more likely than not conceived of his invention while employed at GSC, the court reasoned that the flow meter was very similar to a previous flow meter which he had patented and assigned to GSC years before, and that it was "unlikely [that the former employee had conceived of his invention in five days] in light of the relative simplicity of the invention and the nature of [his] prior work."[138]

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[135] 1987 WL 147798 (D.R.I. July 27, 1987).
[136] *Id.* at *1.
[137] *Id.* at *4.
[138] *Id.* at *5. The invention of a new flow meter was simplistic relative to the already existing flow meter. The court noted that:

> The perfection of a flow meter proved to be a painstakingly intricate process involving extensive testing. It is therefore difficult to believe that after a long and distinguished career with [GSC], [the former employee] in his musing five days after the trailer clause expired for the first time came up with the idea for the [universal flow meter]. Although the word "Eureka!" has allegedly been uttered

ReCor also relies on *Agilent Techs., Inc. v. Kirkland*.[139] The Court in *Agilent Techs., Inc.* held that three former Agilent scientists failed to assign their rights in certain patients; "the facts clearly show that [one scientist] had conceived of and had worked to invent a process to make [the claimed invention], regardless of whether the process worked in practice."[140] As to the other two scientists, the Court held that it was "more likely than not" that they conceived of the claimed invention while at Agilent because of prior experiments that they either participated in or supervised, and which would have reasonably led them to believe that the claimed invention was "achievable" or resulted in their recognition of the claimed invention as a potential solution.[141]

1. The '429 Patent Application

More likely than not, Warnking conceived of the minimally invasive invention using ProRhythm's ultrasound catheter technology before his employment at ProRhythm ended. Indeed, Warnking's inventions were likely the product of an amalgamation of knowledge and experience, some of which he derived from his experience at ProRhythm. Although the idea of using ultrasound for renal denervation was public knowledge by this point, in part because Ardian

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by more than one inventor over the years, the concept at issue does not lend itself to such sudden discovery.

[139] *Agilent Techs., Inc.*, 2010 WL 610725.
[140] *Id.* at *16.
[141] *Id.* at *17.

had disclosed the potential use of ultrasound in renal denervation, the procedure or means to accomplish that task was certainly not publicly known or easily ascertained. Warnking knew from his experience of using ultrasound catheters at ProRhythm that he could deploy an ultrasound catheter into the renal artery so as to impact the renal nerves without affecting the tissue. Indeed, Zou testified in his deposition that after observing the June 27 experiment, "[the renal denervation project] seems to be a straightforward way to do, and also I fully believe we [*i.e.*, every engineer at ProRhythm] have the science background, like ultrasound energy platform in our experience, it's probably easy for us to pursue it."[142] Zou's testimony is consistent with what ProRhythm's scientific advisors had also been saying—that ultrasound, as contrasted with RF energy, was a much more effective means to denervate the nerves surrounding the renal artery.

Warnking's "eureka" moment allegedly came when reading the Ardian patents. While it is factually possible that Warnking first conceived of his inventions at that moment, the Court considers that unlikely. First, Warnking testified that he recognized a "hole" or "space" in the Ardian patents. More likely than not, Warnking knew that he could fill that hole based on an idea he had already conceived in his mind. Indeed, based on his knowledge and experience from using ProRhythm's ultrasound technology and his understanding of

[142] Trial Tr. Vol. II at 393.

dosimetry, as well as having presumably read the manuscript of catheter ablation of the renal sympathetic nerve which Dr. Nakagawa had sent him, Warnking likely had already hypothesized the procedures or means by which he could use ultrasound technology in renal denervation. His ideas were likely what prompted Warnking to review the Ardian patents carefully in the first place.

Second, the evidence supports the view that Warnking first conceived of his invention before studying the Ardian patents. Even if, contrary to the findings of the Court, Warnking did not attend the renal portion of the June 27 study, he did know of it by early September when he sent an email to Dr. Nakagawa inquiring about the results. In that email he wrote: "In order to move forward with this we could use some positive news."[143] If Warnking had not conceived of at least one of his inventions by this point, what were they planning to move forward with?

Even more convincing is the June 27 experiment, which, despite Dr. Nakagawa's testimony that it was unrelated to Warnking's inventions, provided Warnking and his cohorts knowledge that the application of ultrasound to ablate the renal nerves without affecting tissue could be done much faster and easier than originally anticipated.[144] Indeed, the results from that experiment, although not obtained until December, actually showed some ablation of the renal

[143] JX 68 (email from Warnking to Nakagawa).
[144] *See* JX 63 (email from Zou to Jung).

nerves,[145] confirming that the use of ultrasound for renal denervation was feasible. Dr. Nakagawa testified that "his" experiment was merely to use "high-frequency electrical stimulation within the renal artery" to "identify the location of the sympathetic nerve."[146] Although, perhaps, that might have been one purpose of the experiment, the weight of the evidence shows that the June 27 study was both relevant and important to the SII principals. Why else would they include it in a SII draft presentation to investors? Why would Smith alert Dr. Nakagawa to be prepared to talk about the June 27 experiment with a potential investor if it was not relevant to Warnking's inventions? And, perhaps most importantly, why would Warnking be so interested in the results of that experiment in early September 2009 if it was unrelated to what they were planning to go forward with?

Moreover, the renal denervation experiment resembled the invention claimed in the '429 patent application that Warnking filed. Warnking claimed that he invented:

> [A] method of ablating renal nerves from inside the renal artery . . . [that] desirably include[s] the step of positioning an emitter unit, which includes an ultrasonic transducer desirably having a cylindrical shape, in proximity to the kidney inside the renal artery. The transducer may be actuated to generate ultrasonic energy that may

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[145] Trial Tr. Vol. II at 347-48 (Nakagawa).

[146] Trial Tr. Vol. II at 370 (Nakagawa). Warnking's inventions were designed to "knock out nerves without affecting tissue." Trial Tr. Vol. II at 298 (Warnking). Dr. Nakagawa testified that the histo-pathology from the June 27 experiment showed that there was some ablation of the nerves and that the renal artery tissue was also affected. Those findings are consistent with why Warnking was interested in knowing the results of the experiment.

> damage renal nerves surrounding the renal artery without causing necrosis of surrounding tissue.[147]

This procedure resembles the key components of the June 27 experiment. Dr. Nakagawa inserted ProRhythm's touch-up catheter into the renal artery and applied ultrasound energy for varying amounts of time. Although the results may not have been conclusive, they showed that the nerves surrounding the renal artery were damaged.[148] Importantly, the experiment included the application of dosimetry using an ultrasound transducer in the renal artery.[149]

Just as in *General Signal Corp.*, where the former employee recorded his invention only five-days after his invention assignment agreement expired, Warnking filed his patent applications thirty days after his employment at ProRhythm ended without having conducted any tests or experiments. Given the nature of Warnking's work in developing ultrasound catheters, the relative simplicity of the invention, the June 27 renal denervation experiment, and the short period of time in which he filed his patent application after his employment ended, it is more likely than not that he had conceived of the minimally invasive invention at ProRhythm. Indeed, the similarities between the June 27 experiment and

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[147] JX 72 at 18.

[148] At oral argument, the Defendants seemed to argue that the touch-up catheter could not have performed the invention that Warnking describes in his '429 patent application. The Defendants have not supported that position with evidence in the record.

[149] The energy range used in the June 27 experiment was 40 watts. Warnking's patent application discloses that the power range could be as low as 10 watts and as high as 100 watts, but "most typically about 20 to about 30 watts." JX 72.

Warnking's '429 patent application show that Warnking had likely conceived of that invention by then.[150]

2. The '455 Patent Application

ReCor has not satisfied its burden of establishing that Warnking conceived of the noninvasive invention while employed at ProRhythm. In contrast to the '429 patent application, there is a lack of evidence in the record that would permit the Court to conclude that it was more likely than not that Warnking had conceived of the noninvasive invention before his employment at ProRhythm ended.[151]

Warnking knew from his prior experience at ProRhythm that one could transmit ultrasound energy from outside the body for therapeutic purposes, as ProRhythm had done with its incision-less surgery and vasectomy devices.[152] However, ProRhythm stopped developing those noninvasive devices in the early 2000s.[153] Indeed, ProRhythm, throughout its history, had focused mostly on treatments for atrial fibrillation and mitral valve repair, each of which utilized minimally invasive ultrasound catheters. Before 2008, ProRhythm was largely

[150] *Agilent Techs., Inc.*, 2010 WL 610725, at *17.

[151] The lack of evidence may well be due to the inherent difficultly in prosecuting a case where the key employees had every incentive to conceal their intentions and conduct while still employed.

[152] Warnking also testified of another application involving an extracorporeal approach called "Uterine fibroid ablation." Warnking described the program as follows: "You have the patient laying on a bed. Below the patient bed was an MRI system which happened to be a one-sided MRI system. So this was an invention by itself. Typically, MRI systems make you very claustrophobic because you have this tube around you. So this was an open MRI system they wanted to develop plus HIFU applicator." Trial Tr. Vol. I at 259 (Warnking). Warnking testified that this program ended shortly after he joined the company in February 2001. *Id.*

[153] Trial Tr. Vol. I at 258-60 (Warnking).

focused on atrial fibrillation, but, by 2008, ProRhythm had turned its focus to mitral valve repair. Unlike the devices used in atrial fibrillation and mitral valve repair, the noninvasive patent application did not contemplate the use of a catheter device at all.

Most importantly, the June 27 experiment did not include a noninvasive procedure. Although the '455 patent application incorporates some of the same concepts as the '429 patent application and has some similarity with the June 27 experiment—including the use of dosimetry and ultrasound to denerate the renal nerves—the June 27 experiment provides no support for finding that Warnking conceived of the use of an extracorporeal device before September 30, 2009.

While the Court is doubtful that Warnking's "aha" moment occurred while reading the Ardian patents,[154] the Court is left to rely on the fact that Warnking filed the '455 patent application a mere thirty days after his employment at ProRhythm ended. Without more, the Court cannot find that it is more likely than not that Warnking conceived of his noninvasive invention while employed at ProRhythm.[155] Accordingly, the Court need only consider whether the '429 patent application relied on ProRhythm's Proprietary Information.

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[154] The '455 patent application utilizes an imaging technology to locate the renal artery from outside the body. This technology may be similar to what Warnking had developed during his employment predating ProRhythm. See JX 73 (the '455 application); JX 97 (Warnking Dep.) at 38-39.

[155] Similarly, if Warnking did not develop the idea until after he left ProRhythm, any rights under the IAA had not matured in time for transfer to ReCor at the September 30 closing.

E. *Did Warnking's Invention Relate to Proprietary Information?*

The Defendants contend that Warnking's '429 patent application did not incorporate information proprietary or confidential to ProRhythm. Their argument is based on two sub-contentions: (1) Warnking's invention relied solely on publicly known information; and (2) Warnking's invention was completely different from the type of technology utilized at ProRhythm.[156]

As to the former contention, the Defendants assert that the use of ultrasound technology for renal denervation was publicly disclosed by Ardian; that the concept of dosimetry was widely known;[157] and that the transducer, balloon, and generator described in Warnking's invention are generic components of an ultrasound catheter system.[158] As to the latter contention, the Defendants assert that ProRhythm never performed any renal denervation work, nor did it have the technology to do renal denervation work because ProRhythm's firmware did not have the ability to make the necessary selection of power levels.[159] The Defendants also point out that the SII devices relating to renal denervation have

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[156] Defs.' Br. 23-27.
[157] Trial Tr. Vol. II at 299 (Warnking).
[158] Defs.' Br. 24; *see* Trial Tr. Vol. II at 298 (Warnking).
[159] Trial Tr. Vol. I at 184, 203-04. The Defendants also assert that SII's devices are significantly different from those used at ProRhythm and that the range of dosimetry used for renal denervation is much lower than what is used in mitral valve repair or atrial fibrillation. Defs.' Br. 25-26.

taken years to develop, underwent roughly six iterations, and required over forty animal studies to perfect.[160]

The Defendants' arguments must be read in the context of the IAA. As discussed above, the term Proprietary Information is defined broadly. It encompasses "trade secrets or proprietary or confidential information respecting inventions, . . . know-how, techniques, technology, . . . in whatever form, tangible or intangible . . . relating to any matter within the scope of the business of the Company or concerning any of the dealings or affairs of the Company." Under Section 2(a), the conception of "any interest" in Proprietary Information "whether or not patentable" that relates to the business of the company becomes a "Development" and the property of ProRhythm. As written, these provisions reasonably cover any ideas that relate to ProRhythm's proprietary or confidential information.

The key components of Warnking's '429 patent application include the use of dosimetry, the positioning of an ultrasound catheter in the renal artery, and a method or procedure for ablating the renal nerves. The record reflects that Warnking relied on public information for some of his invention. The general concept of dosimetry, the use of ultrasound in renal denervation,[161] and a generic

[160] Trial Tr. Vol. II at 471.
[161] The use of ultrasound in renal denervation was publicly disclosed in the Ardian patents. *See* JX 14 at 18.

catheter system were all publicly disclosed. What was not publicly disclosed or generally known, and what Warnking claimed as his invention, was a procedure or method of performing renal denervation by use of a specific ultrasound catheter, including the proper dosimetry range. Thus, the question is whether his idea touches upon ProRhythm's Proprietary Information?

That question turns in large part on the June 27 experiment. Given the Court's factual findings, the June 27 study and the information gleaned from it were proprietary and confidential to ProRhythm. ProRhythm had a proprietary interest in the procedure employed, the devices used, the dosimetry range, and of course, the results obtained. If renal denervation was not already within the scope of the business of ProRhythm,[162] the June 27 experiment certainly made it part of the "dealings or affairs" of the company. Thus, a more precise question is whether Warnking's idea relates to the June 27 experiment?

The Defendants contend that Warnking could not have relied upon the June 27 experiment in developing his '429 patent application because the renal histo-pathology was not completed until December, well after Warnking had filed his patent application. That reasoning has a certain amount of logic to it, but it overlooks the fact that the essential elements of Warnking's invention were generally included in the June 27 renal denervation experiment. Having witnessed

[162] The application of ultrasound technology for a cardiovascular therapy was within the scope of ProRhythm's business.

the experiment (or at least learned about it), Warnking learned from the procedure employed by Dr. Nagakawa. As Zou testified, the June 27 experiment proved that the ultrasound renal denervation procedure was much easier than anticipated. Moreover, the dosimetry used in the experiment was also instructive because the power level used was much lower than what ProRhythm had typically utilized. Dr. Nakagawa also likely had a preliminary indication of how the experiment had gone,[163] which, given the similarities between the '429 patent application and the experiment, would have likely informed how Warnking conceived of his invention.[164]

Indeed, the mere similarity between the June 27 renal denervation study and Warnking's '429 patent application suggests that his idea touches upon the

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[163] The Defendants insinuate that the "negative" feedback from the June 27 renal denervation experiment is evidence that Warnking could not have learned anything from the study and that the experiment should have even deterred Warnking from pursuing renal denervation. While the Defendants' insinuations are undermined substantially by SII's subsequent use of the study to attract investors, they also fail to account for what Warnking could have learned from the study even if it, in fact, produced a negative result.

Dr. Nakagawa testified at trial that the results of the June 27 renal denervation experiment were inconclusive and negative with respect to both the ablation of the renal nerve and the changes in the blood pressure. Trial Tr. Vol. II at 375 (Nakagawa). Taking Dr. Nakagawa at his word, Dr. Nakagawa testified that the main purpose of the study was to identify the location of the sympathetic nerve. In that respect, Dr. Nakagawa claimed his experiment was inconclusive. *Id.* However, with respect to the ablation of the renal nerve, Dr. Nakagawa testified that he "was hoping" for "more extensive nerve ablation." *Id.* at 348. Although he may not have achieved exactly what he was hoping for, he still ablated the renal nerve using ProRhythm's ultrasound catheter. From that experience, Dr. Nakagawa and Warnking could have obtained a plethora of valuable information, including that the power setting was too high or too low, the timing was too long or too short, the transducer and balloon were too big or too small, and the positioning of the catheter was not optimal. Thus, the Defendants' attempt to explain away the June 27 renal denervation experiment and reduce it to a complete failure is contradicted both by facts in the record and logic.

[164] *See* JX 103 (Nakagawa Dep.) at 40; Trial Tr. Vol. I at 31, 76-77 (Iyer).

experiment. And, although the Defendants have attempted to distinguish Warnking's inventions from the technology employed at ProRhythm, there is no question that they reflect concepts and knowledge that Warnking applied at ProRhythm. The ProRhythm therapeutic devices all utilized ultrasound. Some were minimally invasive, while others were extracorporeal. Dosimetry was also employed at ProRhythm in varying amounts depending on the particular treatment. Even if some of the differences in the technology employed by SII and ProRhythm are material,[165] as the Defendants argue, the '429 patent application and the ideas incorporated therein, do relate to both the technology utilized at ProRhythm and the June 27 experiment.

Under Section 2(a) of the IAA, Warnking agreed that if he conceived of any inventions touching upon Proprietary Information (*i.e.*, "Developments"), that such "Developments . . . shall immediately become the sole and absolute property of the Company and its assigns . . . ." In sum, more likely than not, Warnking conceived of the substance of his minimally invasive invention while still employed at ProRhythm. Because Warnking's invention relates to the June 27 experiment, which was proprietary to ProRhythm, it is subsumed within the IAA and became an asset of ProRhythm. As a result, ReCor acquired it through the APA.

[165] The Defendants argue that ProRhythm did not even have the technology necessary to do renal denervation work because ReCor had to hire Zou to modify ProRhythm's old firmware to enable ReCor to make the necessary selection of power levels. That, however, does not provide a substantive basis for concluding that Warnking's inventions did not include the use of ProRhythm's Proprietary Information.

F. *The Fiduciary Duty Claim*

Because ReCor has shown that it is entitled to ownership of the '429 patent application, the Court does not need to address ReCor's fiduciary duty claim with respect to that patent. The Court also does not need to resolve whether Warnking breached his fiduciary duty with respect to the noninvasive invention because ReCor has not shown that Warnking conceived of that invention while employed at ProRhythm. Thus, ReCor cannot show by a preponderance of the evidence that Warnking breached his fiduciary duties to ProRhythm by failing to inform the ProRhythm board of his noninvasive renal denervation idea.

G. *Attorneys' Fees*

Having prevailed in part in this litigation, ReCor is entitled to reasonable attorneys' fees and costs under the contractual fee-shifting provision in the IAA. Although ReCor did not explicitly assume the IAA when it acquired ProRhythm's assets under the APA, it did acquire the right to assert "any claims, lawsuits, or rights" ProRhythm had at the time of the acquisition.[166] Under Section 5 of the IAA, ProRhythm and Warnking agreed that: "The prevailing party in any litigation arising under this Agreement shall be entitled to recover his or its attorneys' fees and expenses in addition to all other available remedies."[167] Accordingly, having acquired the right to pursue ProRhythm's contractual right to reasonable attorneys'

[166] APA § 2.01(c).
[167] JX 4 (IAA) § 5.

fees and expenses, and having prevailed in part in this litigation on behalf of ProRhythm, ReCor is entitled to reasonable attorneys' fees and expenses.[168]

IV. CONCLUSION

ReCor has established by a preponderance of the evidence that (1) Warnking had conceived of his minimally invasive invention while employed at ProRhythm and (2) ProRhythm acquired Warnking's minimally invasive invention under the IAA. ReCor has not satisfied its burden at trial to prove that Warnking had conceived of his noninvasive invention during his employment at ProRhythm.

Warnking agreed under Section 5 of the IAA that a "breach of this Agreement by [him] would cause irreparable damage to [ProRhythm]" and that ProRhythm "shall have . . . the right to an injunction, specific performance, or other equitable relief to prevent the violation of my obligations hereunder."[169] In addition to the contractual rights to an injunction and specific performance, which rights ReCor acquired in the APA, the relief best suited to put ProRhythm (and ReCor) in the position it should have been absent the breach of the IAA, is the following. The Court declares that ReCor is the rightful owner of the '757 PCT

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[168] *See L&W Ins., Inc. v. Harrington*, 2007 WL 1756540, at *3 (Del. Ch. June 6, 2007) ("Where a contract places the responsibility for payment of attorneys' fees 'on any party who either breaches the contract or fails to perform in accordance with the terms of the contract,' courts will enforce the bargained-for provision absent evidence of an ambiguity or contrary intent.") (quoting *Knight v. Grinnage*, 1997 WL 633299, at *3 (Del. Ch. Oct. 7, 1997)).

Determination of the appropriate award must await development of the necessary factual record.

[169] JX 4 (IAA) § 5.

patent application and the patent applications from which the '757 PCT patent application claims priority (*i.e.*, the '429 and '618 patent applications). In addition, the Defendants are enjoined from making further use of the technology claimed in the applicable patents (except to the extent that such technology was in the public domain as of the filing date of such intellectual property) and are ordered to take all necessary steps to transfer to ReCor the applicable patents, all books and records pertaining thereto, and all the attendant rights to the applicable patents and the technology claimed therein.

Counsel are requested to confer and to submit an implementing form of order.