UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

MAQUET CARDIOVASCULAR LLC,	)	
	)	
Plaintiff/Counterdefendant,	)	
	)	**Civil Action No.**
v.	)	**17-12311-FDS**
	)	
ABIOMED, INC., ABIOMED R&D, INC., and ABIOMED EUROPE GMBH,	)	
	)	
Defendants/Counterclaimants	)	

MEMORANDUM AND ORDER ON MAQUET'S MOTION FOR PARTIAL SUMMARY JUDGMENT AS TO DEFENSES OF LACK OF WRITTEN DESCRIPTION, LACK OF ENABLEMENT, AND INDEFINITENESS

SAYLOR, J.

This is an action for patent infringement. It is the second lawsuit between the parties concerning a line of intravascular blood pumps. *See Abiomed, Inc. v. Maquet Cardiovascular LLC*, No. 16-cv-10914-FDS (D. Mass.) ("*Abiomed I*"). In this case, plaintiff Maquet Cardiovascular LLC has sued defendants Abiomed, Inc., Abiomed R&D, Inc., and Abiomed Europe GmbH for infringing U.S. Patent No. 10,238,783 (filed Sept. 21, 2018) ("the '783 patent"). Defendants (collectively, "Abiomed") have counterclaimed for declaratory judgment of noninfringement.

Maquet has moved for partial summary judgment on four of Abiomed's invalidity theories: lack of written description and enablement of the term "intravascular blood pump" in claims 1-3 and 24; lack of written description of the term "intravascular blood pump comprising a cannula" in claim 3; indefiniteness of the term "partially disposed" in claim 24; and

indefiniteness of the term "elongate catheter" in claim 3. For the reasons set forth below, the motion will be terminated as moot as to the defense of lack of written description of the term "intravascular blood pump comprising a cannula" in claim 3; granted as to the defense of indefiniteness of the terms "partially disposed" in claim 24 and "elongate catheter" in claim 3; and otherwise denied.

I. Background

The '783 patent is a descendant of earlier patents held by Maquet that disclose guidance systems for intravascular blood pumps. The underlying technology is described in the Court's memorandum and order on claim construction in this case. (Dkt. No. 248, at 2-4).

As relevant here, independent claim 1 of the '783 patent recites, in part, as follows:

> An intravascular blood pump system, comprising:
>
> an intravascular blood pump, comprising:
>
> > a rotor having a rotor hub tapering in a distal direction, at least one blade extending outward from the rotor hub, the rotor hub has a distal end extending distally beyond the most distal portion of the at least one blade and
> >
> > a shroud within which the rotor is rotably disposed;
> >
> > a cannula extending from the shroud and comprising an outer cannula surface, the outer cannula surface having a substantially circular cross-section along a portion of its length;
> >
> > [and a guide mechanism].

('783 patent, col. 33 ll. 60-61 and col. 34 ll. 1-14). Thus, and in simplified terms, the claimed invention is a pump designed to operate inside a human heart and a mechanism to guide it there. Claim 1 has four basic components: a rotor, a shroud, a cannula, and a guide mechanism.

Claims 2 and 3 are dependent on claim 1. Claim 3 "further comprise[es] an elongate catheter extending proximally with respect to the intravascular blood pump." (*Id.* col. 34 ll. 22-23).

Independent claim 24 recites, in relevant part,

> An intravascular blood pump system comprising:
>
> an intravascular blood pump adapted to be guided to a predetermined location within a circulatory system of a patient by a guide wire and configured to provide left-heart support, the intravascular blood pump comprising a rotor having a rotor hub tapering in a distal direction and a rotor shroud at least partially disposed about the rotor hub, at least one blade extending outward from the rotor hub, a distal end of the rotor hub extending distally beyond a most distal portion of the at least one blade.

('783 patent, col. 37 ll. 32-42).

A pump will not work without a propulsion system to turn the rotor—here, an electric motor and a means to connect the motor to the rotor. As of this writing, there are only two available propulsion systems for intravascular blood pumps: (a) an external motor (that is, outside the patient) connected to the pump by a flexible and sheathed cable, or (b) a miniaturized and integrated motor that is placed inside the heart. None of the asserted claims recites a motor or other drive mechanism for the intravascular blood pump. (Dkt. No. 443 ¶ 2).

The specification of the patent describes three examples of integrated guide mechanisms: an "over-the-wire" guide mechanism, a "side-rigger" or "rapid exchange" type guide mechanism, and an integrated guide mechanism. All three examples include a cable-mounted rotor coupled to a motor external to the patient's body. (Dkt. No. 497 ¶ 34). There are no examples in the specification of any other type of drive mechanism for the intravascular blood pump.

The accused products—certain Abiomed Impella devices—have an integrated internal motor, not an external motor with a cable drive.

Abiomed contends, among other things, that the '783 patent is invalid for lack of written description and lack of enablement because it claims a "genus" of intravascular blood pumps without describing or enabling the "species" of pumps with integrated internal motors. Maquet

has moved for partial summary judgment on Abiomed's defenses of written description and lack of enablement, contending that the drive mechanism is an unclaimed feature. Maquet has also moved for partial summary judgment on Abiomed's defenses that the term "intravascular blood pump comprising a cannula" lacks written description and that the terms "partially disposed" and "elongate catheter" are invalid for indefiniteness.

II. Legal Standard

The role of summary judgment is "to pierce the pleadings and to assess the proof in order to see whether there is a genuine need for trial." *Mesnick v. General Elec. Co.*, 950 F.2d 816, 822 (1st Cir. 1991) (quoting *Garside v. Osco Drug, Inc.*, 895 F.2d 46, 50 (1st Cir. 1990)). Summary judgment shall be granted when "there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a). A genuine issue is "one that must be decided at trial because the evidence, viewed in the light most flattering to the nonmovant, would permit a rational factfinder to resolve the issue in favor of either party." *Medina-Munoz v. R.J. Reynolds Tobacco Co.*, 896 F.2d 5, 8 (1st Cir. 1990) (citation modified). In evaluating a summary judgment motion, the court indulges all reasonable inferences in favor of the nonmoving party. *See O'Connor v. Steeves*, 994 F.2d 905, 907 (1st Cir. 1993). When "a properly supported motion for summary judgment is made, the adverse party must set forth specific facts showing that there is a genuine issue for trial." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250 (1986) (citation modified). The nonmoving party may not simply "rest upon mere allegation or denials of his pleading," but instead must "present affirmative evidence." *Id.* at 256-57.

Because "[a] patent shall be presumed valid," 35 U.S.C.§ 282, a defendant arguing invalidity must prove that defense by clear and convincing evidence. *Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 95 (2011). That heightened burden applies even at the summary judgment

stage. *See Anderson*, 477 U.S. at 254 ("[I]n ruling on a motion for summary judgment, the judge must view the evidence presented through the prism of the substantive evidentiary burden.").

III. Analysis

A. "Intravascular Blood Pump" Invalid for Lack of Written Description and Enablement

Abiomed contends that the term "intravascular blood pump" in claims 1-3 and 24 is invalid for lack of written description and lack of enablement. Maquet has moved for summary judgment of no invalidity on both theories.

1. Whether the Term "Intravascular Blood Pump" Is Invalid for Lack of Written Description

a. Legal Framework

A patent specification must "contain a written description of the invention." 35 U.S.C. § 112(a). Claims that lack adequate written description are therefore invalid. *See Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1340 (Fed. Cir. 2010). To satisfy that requirement, the specification must "clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed." *Id.* at 1351 (citation modified). In other words, the written description "must convey with reasonable clarity . . . that, as of the filing date sought, [the patentee] was in possession of the invention." *Carnegie Mellon Univ. v. Hoffmann-La Roche Inc.*, 541 F.3d 1115, 1122 (Fed. Cir. 2008) (citation modified). "[T]he invention is, for purposes of the 'written description' inquiry, *whatever is now claimed*." *In re Entresto*, 125 F.4th 1090, 1097 (Fed. Cir. 2025) (emphasis in original) (quoting *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1564 (Fed. Cir. 1991)).

Evaluating a written description "requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art." *Ariad Pharms.*, 598 F.3d at 1351. "This inquiry . . . is a question of fact." *Id.* The "level of detail required to satisfy

the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology." *Id.*

In the words of Judge Lourie, concurring in the denial of *en banc* review in *LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 433 F.3d 1373 (Fed. Cir. 2006):

> Whatever inconsistencies may exist in the application of the law lie in the different fact situations with which the courts are faced. Compliance with the written description requirement has been held to be a question of fact, so what constitutes an adequate written description depends on what is claimed and what is described.
>
> . . .
>
> [I]n whatever form the claims are finally issued, they must be interpreted, in light of the written description, but not beyond it, because otherwise they would be interpreted to cover inventions or aspects of an invention that have not been disclosed. Claims are not necessarily limited to preferred embodiments, but, if there are no other embodiments, and no other disclosure, then they may be so limited. One does not receive entitlement to a period of exclusivity for what one has not disclosed to the public.

Id. at 1375 (Lourie, J., concurring).

There are three lines of cases that potentially affect how the written description requirement may apply here: the "unclaimed feature" cases; the "genus/species" cases; and a line of cases concluding, in differing contexts, that an unduly narrow written specification can invalidate an unsupported broader claim.

The first line of cases concerns unclaimed features. Because the written-description requirement applies only to what is claimed, and "does not apply to the entirety of an infringing product," a specification need not describe features that are not claimed. *See Teva Branded Pharm. Prods. R&D, Inc. v. Amneal Pharms. of New York, LLC*, 124 F.4th 898, 914 (Fed. Cir. 2024); *In re Entresto*, 125 F.4th at 1098-99 (stating that specification need only describe "whatever is now claimed"). An infringing product therefore may, and often does, include

"additional features beyond what the patent claims." *Teva*, 124 F.4th at 913.

Maquet contends that the drive mechanism of the intravascular blood pump is an unclaimed feature—that is, it contends that because none of the asserted claims recites a drive mechanism as a component of the intravascular blood pump, the specification need not provide written description for any type of drive mechanism.

The second line of cases is the "genus/species" cases. A patent may claim a class of things defined by common characteristics (a "genus"), as exemplified by embodiments that fall within that class (the "species"). *See Teva Pharms. Int'l GmbH v. Eli Lilly & Co.*, 2023 WL 6282898, at *8 n.11 (D. Mass. Sept. 26, 2023), *rev'd*, 2026 WL 1025802 (Fed. Cir. 2026). The written description must, however, demonstrate that the inventor possessed the "full scope" of a genus claim. *Juno Therapeutics, Inc. v. Kite Pharma, Inc.*, 10 F.4th 1330, 1337 (Fed. Cir. 2021). That "requires the disclosure of 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*, 598 F.3d at 1350 (quoting *Regents of the Univ. of California v. Eli Lilly & Co.*, 119 F.3d 1559, 1568 (Fed. Cir. 1997)); *see Synthes USA, LLC v. Spinal Kinetics*, 734 F.3d 1332, 1344-45 (Fed. Cir. 2013). The genus/species framework can be applied to the "mechanical world," notwithstanding the fact that the field is "fairly predictable." *Id*. at 1345.

In *Synthes*, the Federal Circuit affirmed a jury verdict of invalidity for lack of written description where the specification in question was for a device designed to replace a disc located between adjacent vertebrae of the human spine. 734 F.3d at 1334-35, 1345. At issue was a part of a claim requiring "a third plate operatively coupled to the first bone contacting plate, the third plate including a plurality of openings," which the court construed to mean "the

third plate including two or more openings to allow the fiber system to be joined or anchored to that plate." *Id.* at 1336, 1339. The genus was thus "openings"; the written description disclosed one member of the species—peripheral grooves—but no other members of the species, such as internal slots. *Id.* at 1341. The court noted that the jury was free to conclude, "based on [the trial testimony]," that "there would be *significant biomechanical differences* between using peripheral grooves and internal slots" and "that the use of internal slots for these devices was *not predictable*." *Id.* at 1344 (emphasis added). It therefore concluded that there was substantial evidence that in "the field of intervertebral implants, the disclosure of peripheral grooves [in the specification] does not adequately demonstrate possession of the entire genus of possible openings" in the asserted claims. *Id.*

Among other things, the *Synthes* court noted the following:

> [A]s we stated in [*Bilstad v. Wakalopulos*, 386 F.3d 1116 (Fed. Cir. 2004)]:
>
> > [i]f the difference between members of [a species] is such that [a] person skilled in the art would not readily discern that other [species] of the genus would perform similarly to the disclosed members, i.e., if the art is unpredictable, then disclosure of more species is necessary to adequately show possession of the entire genus.
>
> *Id.* at 1125. In other words, predictability is a factual issue judged on a case-by-case basis.

Id. at 1344.

Abiomed contends that the term "intravascular blood pump" falls within the "genus/species" line of cases. It contends that the patent claims a genus of intravascular blood pumps, and that cable-driven and internally driven pumps are species within that broad genus. It further contends that the specification, which discloses only a single species (cable-driven pumps), does not provide sufficient description as to the full scope of the genus (all pumps,

including cable and internally driven pumps).[1]

The third line of cases provides that a claim can be invalid for lack of written description where a narrow specification is insufficient to support a broader claim. *See ICU Med., Inc. v. Alaris Med. Sys., Inc.*, 558 F.3d 1368, 1376-77 (Fed. Cir. 2009); *LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F.3d 1336, 1344-46 (Fed. Cir. 2005); *see also* 3 ROBERT A. MATTHEWS, JR., ANNOTATED PATENT DIGEST § 22:34 (2026) ("The written-description requirement generally does not require a description of unclaimed aspects of the invention, unless those aspects are critical to the claimed invention."); *cf. Gentry Gallery, Inc. v. Berkline Corp.*, 134 F.3d 1473, 1479 (Fed. Cir. 1998) (stating, in the context of claim construction, that "in a given case, the scope of the right to exclude may be limited by a narrow disclosure" in the specification).

In *ICU Medical*, the specification "repeatedly and uniformly" described the invention as including a spike "for the purpose of piercing a seal inside the [medical] valve." 558 F.3d at 1374-75. The asserted claims, however, had no spike limitation. *Id.* at 1377. The court concluded that those spikeless (that is, spike optional) claims were invalid for lack of written description because "the figures and descriptions that include spikes [did not] demonstrate that the inventor possessed a medical valve that operated without a spike. . . . [A] person of skill in the art would not understand the inventor . . . to have invented a spikeless medical valve." *Id.* at 1378. In other words, the spike was "critical to the inventor's contribution," *Zimmer Surgical,*

[1] To be clear, the fact that the specification only describes cable-driven blood pumps is not alone enough for a finding of invalidity. *See Martek Biosciences Corp. v. Nutrinova, Inc.*, 579 F.3d 1363, 1371 (Fed. Cir. 2009) ("[A] patent claim is not necessarily invalid for lack of written description just because it is broader than the specific examples disclosed."); *Lampi Corp. v. Am. Power Prods., Inc.*, 228 F.3d 1365, 1378 (Fed. Cir. 2000) ("It is a familiar principle of patent law that a claim need not be limited to a preferred embodiment. Although the patent drawings show only identical half-shells, that does not compel the conclusion that the written description of the '875 patent is so narrowly tailored as to preclude Lampi from claiming non-identical half-shells in the '227 patent." (citations omitted)).

Inc. v. Stryker Corp., 365 F. Supp. 3d 466, 483 (D. Del. 2019), and "having a spike within the medical valve was necessary to the use of the claimed invention," *Crown Packaging Tech., Inc. v. Ball Metal Beverage Container Corp.*, 635 F.3d 1373, 1382 (Fed. Cir. 2011).[2]

Similarly, in *LizardTech*, the patent described a method of digital image compression by creating seamless discrete wavelet transforms (DWT). 424 F.3d at 1337-39. The specification provided one method for creating a seamless DWT: maintaining updated sums. *Id.* at 1344. The asserted claim, however, included no such limitation. *Id.* The court held that the claim was invalid, as "a person of skill in the art would not understand how to make a seamless DWT generically and would not understand LizardTech to have invented a method for making a seamless DWT, except by 'maintaining updating sums of DWT coefficients.'" *Id.*

Abiomed further contends that the claims are invalid under the *ICU Medical/LizardTech* line of cases because the specification attributes a particular function to the cable drive—turning the pump rotor—that could not be accomplished without such a drive, and therefore the narrow disclosure of cable-driven intravascular blood pumps is not sufficient to support the broader claim of all intravascular blood pumps.

b. The Court's Decision in *Abiomed I*

The Court addressed a related issue in *Abiomed I*, which involved a related patent, No. 7,022,100 ("the '100 patent").

[2] In *Allergan USA, Inc. v. MSN Laby's Private Ltd.*, 111 F.4th 1358 (Fed. Cir. 2024), the Federal Circuit explained in part its decision in *ICU Medical* as follows:

> First, the entirety of the specification in *ICU Medical* described *only* medical valves having spikes. . . . Second, the specification in *ICU Medical* attributed a particular function to the spike—piercing a seal inside the valve—that could not be accomplished without a spike.
>
> *Id.* at 1375.

In *Abiomed I*, at the claim-construction stage, Abiomed asked the Court to construe the term "intravascular blood pump" in the '100 patent to be limited to cable-driven blood pumps. *Abiomed, Inc. v. Maquet Cardiovascular LLC*, 329 F. Supp. 3d 1, 18 (D. Mass. 2018), *aff'd in part & rev'd in part*, 2026 WL 346501 (Fed. Cir. Feb. 9, 2026). Maquet argued the term was "broad enough to encompass . . . cable-driven blood pumps and other types of pumps." *Id.* at 21. The Court agreed with Maquet and gave the term its ordinary meaning. *Id.* In so deciding, however, the Court noted that Maquet "may later have to defend that scope against a challenge under § 112." *Id.*[3]

Abiomed then moved for summary judgment of invalidity "because the specification fail[ed] to disclose a species representative of guidance systems for internally-driven pumps." *Abiomed, Inc. v. Maquet Cardiovascular LLC*, 2023 WL 4034268, at *4 (D. Mass. June 15, 2023). It contended that the '100 patent covered a genus of blood-pump systems with two different species: cable-driven and internally driven pumps. *Id.* Because, it contended, the specification disclosed only cable-driven pumps, but no others, the written description did not support a genus claim. *Id.*

The Court disagreed and denied that portion of the motion. *Id.* at *11. It reasoned that "[t]he claimed function is guiding an intravascular blood pump and cannula into the circulatory system, and the claimed means are the three structures disclosed in the specifications." *Id.* at *10. While "the specification must adequately describe a device that achieves that result," the Court concluded that "there [was] a genuine dispute of fact as to whether the disclosure of a

[3] The Court's claim-construction order also construed the term "guide mechanism adapted to guide said intravascular blood pump and cannula to a predetermined location within the circulatory system of a patient" in the '100 patent as a means-plus-function term. *Abiomed*, 329 F. Supp. 3d at 38, *aff'd in relevant part*, 2026 WL 346501, at *6-7 (Fed. Cir. Feb. 9, 2026). As noted, that issue is not the subject of the present motion.

guidance system using cable-driven motors [was] sufficient to satisfy the written-description requirement for a guidance mechanism using internally driven pumps." *Id.* at *8, *11.

The immediate question before the Court is somewhat different from the one in *Abiomed I*, but at core the issue is the same: whether the adequacy of the written specification can be resolved on summary judgment. There, the Court ruled against Abiomed on that issue; here, for the reasons set forth below, it will likewise rule against Maquet.

c. Analysis

Maquet's position—that the drive mechanism is an unclaimed feature—has superficial appeal. A pump of any kind is useless unless it has a drive mechanism. Under ordinary circumstances, an inventor could patent an improved pump without claiming such a mechanism.[4] Thus, for example, an inventor could create a quieter and more efficient water pump for automobile cooling systems that would work equally well whether it was driven by an electric motor, a belt, a chain, or a gear. Even though the water pump would not function without some form of propulsion, the electric motor or mechanical drive would normally be considered an unclaimed feature. And even if the specification only referred to an electric motor drive, it is likely that a POSA could readily see that the device would also work if driven by a belt, a chain, or a gear.

The question here is whether that same legal construct should be applied directly to this context. It is true that the patent does not claim any type of drive mechanism. But the claimed

[4] For the sake of simplicity, in this discussion, the Court will assume a pump that employs a rotor to impel a fluid, although a pump can utilize other mechanisms (such as a screw or cylinder) to move other materials (such as a gas).

The term "pump' is also used colloquially to refer both to a pump and power units together (such as a portable submersible pump to deal with flooding) or the pump unit alone. For the sake of simplicity, the Court will use the term "pump" to refer to an unpowered device.

invention—an "intravascular blood pump"—is not just a fluid pump, adaptable to any conventional form of propulsion. Rather, it is a highly sophisticated miniaturized device that must be guided to, and then operate in, an extraordinarily challenging environment—the beating heart of a live human being. Any device incorporating such a pump must include both a guidance mechanism (to position it in the heart) and a drive mechanism (to operate the rotor), or it will not function. And it must function in a way that not only serves its purpose (providing adequate blood flow), but to do so in a way that does not injure or kill the patient.

Under the circumstances, the Court concludes that Maquet cannot foreclose any inquiry into the adequacy of the written description by the expedient of failing to claim a drive mechanism for the pump. The patent claims an "intravascular blood pump"—again, a pump that will operate inside the heart—that of necessity must have a drive mechanism. It is undisputed that Maquet possessed one type of pump drive mechanism (cable-driven) and disclosed that embodiment in the specification. Whether a person of ordinary skill in the art could read the description and recognize that the invention would apply to a pump with a different type of drive mechanism is a question of fact. *See Ariad Pharms.*, 598 F.3d at 1351. But without any written-description analysis, the claim "[could] be interpreted to cover inventions or aspects of an invention that have not been disclosed." *LizardTech*, 433 F.3d at 1375. (Lourie, J., concurring).

Again, the evaluation of a written description "requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art." *Ariad Pharms.*, 598 F.3d at 1351. And the "level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology." *Id.* Accordingly, the Court will examine the facts in the light most favorable to Abiomed, the non-moving party.

Dr. Lakshmi Prasad Dasi, Abiomed's expert, opines that a person of ordinary skill in the art "would have recognized that . . . the drive cable [is] not . . . some optional aspect of the named inventors' device." (Dkt. No. 499-1, ¶ 363).

In summary, Dr. Dasi opines that a person of skill in the art "would have recognized that the invention concerned guide mechanisms specifically for cable-driven blood pumps, and that the drive cable was critical to the invention of the '783 patent." (Dkt. No. 495 at 9). Among other things, a POSA "would have recognized that [the] drawbacks described in the specification were specific to cable-driven pumps." (*Id.*). The specification notes that "[a] significant drawback [of] prior art intravascular blood pumps [is that they] are difficult to guide into the appropriate position with the circulatory system of a patient. This is due largely to the fact that the elongated catheter is incapable of providing the degree of control necessary" because it has a "natural tendency . . . to stay straight." ('783 Patent col. 2 ll. 22-32). Dr. Dasi explains that the tendency to stray straight is a result of the drive cable "need[ing] to have certain mechanical properties, including stiffness and torsion resistance." (Dkt. No. 499-1, ¶ 356). Therefore, "a POSA would understand that the difficulty with catheters for placement . . . is referring to a problem that arises from cable-driven blood pumps." (*Id.*).

Second, Dr. Dasi notes that all embodiments describe a cable-driven system and "[a]spects to accommodate external motors and drive cables are present throughout the claimed inventions." (Dkt. No. 499-1, ¶ 368). For example, for the over-the-wire embodiment, the specification explains: "The shaft 46 is generally hollow and dimensioned to receive a cable adapter 60 therein for the purpose of coupling the rotor [a claimed element] to a drive cable 62 forming part of the drive cable assembly 18." ('783 Patent col. 11 ll. 21-24). Dr. Dasi reasons that "[i]t is readily apparent to a POSA that the reason the specification addresses how the other

components must be arranged with respect to the drive cable . . is that the drive cable for the cable-driven heart pump was so fundamental and omnipresent, in the inventor's eyes, that it was not possible to teach a POSA how to make and use the other aspects of the invention without addressing the drive cable." (Dkt. No. 499-1, ¶ 363).

Dr. Dasi also opines that the use of internally driven pumps was unpredictable at the time of the invention." (*Id.* ¶¶ 595-607). Because of structural differences between internally driven pumps and conventional cable-driven pumps, a POSA would have recognized that one could not apply the claimed guidance system to internally driven pumps based on the specification's description of cable-driven pumps. (*Id.*). Among other things, such a pump would not use a guidewire through a central lumen because the lumen would hollow out the shaft and increase the size of the motor, and such a lumen would introduce unacceptable bending. (*Id.* ¶ 604).

It is of course true that Maquet's expert witness, Boris Leschinsky, holds a contrary view. But this issue is presented on a motion for summary judgment, and again the Court must examine the evidence in the light most favorable to the non-moving party.

It is unclear to the Court whether the proper framework for considering the issue is the genus/species line of cases or the *ICU Medical*/*LizardTech* line of cases. A reasonable factfinder could conclude that the relevant "genus" is "intravascular blood pumps"; that the relevant "species" are cable-driven and internally powered pumps; and that the disclosure of the cable-driven species is not adequate to demonstrate that the inventor possessed the full scope of the claimed genus. A reasonable factfinder could also conclude that the narrow disclosure of cable-driven intravascular blood pumps is not sufficient to support the broader claim of all intravascular blood pumps, because the specification attributed a particular function to the cable drive—turning the pump rotor—that could not be accomplished without such a drive.

For present purposes, the Court will not resolve that issue. Regardless of whether the appropriate framework is the genus/species or *ICU Medical/LizardTech* line of cases, the outcome is the same: there is a dispute of material fact as to whether the written-description requirement of § 112 is satisfied. A reasonable trier of fact could find that Abiomed has established by clear and convincing evidence that Claims 1-3 and 24 are invalid on the ground the term "intravascular blood pump" has an insufficient written description because the specification discloses only cable-drive mechanisms. The Court will therefore deny the motion for summary judgment as to the defense of lack of written description.

2. Whether the Term "Intravascular Blood Pump" Is Invalid for Lack of Enablement

Enablement under 35 U.S.C. § 112(a) is a distinct requirement. *See Ariad Pharms.*, 598 F.3d at 1351. While written description asks whether the inventor had possession of the invention as claimed, enablement asks "whether undue experimentation is required to make and use the full scope of embodiments of the invention claimed." *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 959 F.3d 1091, 1100 (Fed. Cir. 2020). Like written description, enablement "is limited to . . . only the claimed invention, not matter outside the claims." *Id.* 1100 (citation modified). Moreover, the "requirement is met if the description enables any mode of making and using the invention." *Invitrogen Corp. v. Clontech Lab'ys, Inc.*, 429 F.3d 1052, 1071 (Fed. Cir. 2005) (quoting *Johns Hopkins Univ. v. CellPro, Inc.*, 152 F.3d 1342, 1361 (Fed. Cir. 1998)). "[W]hether a patent satisfies the enablement requirement is a question of law based on underlying factual findings." *McRO*, 959 F.3d at 1096.

Abiomed contends that the specification does not enable the full scope of the genus of intravascular blood pumps that includes both cable-driven and internally driven pumps. Maquet contends that the claimed invention does not recite a drive mechanism and therefore the

specification need not enable the ways in which the claimed "intravascular blood pump" could be driven.

In the cases cited by Abiomed, the claimed invention included the class, method, or component that was not enabled. *See Amgen Inc. v. Sanofi*, 143 S. Ct. 1243, 1250, 1256 (2023) (explaining that the claim encompassed an entire genus of antibodies that performed a particular function but enabled only 26 identified antibodies); *Sitrick v. Dreamworks, LLC,* 516 F.3d 993, 996, 1000-01 (Fed. Cir. 2008) (explaining that the claim encompassed both video games and movies but enabled only video games); *Automotive Techs. Int'l, Inc. v. BMW of N. Am., Inc*., 501 F.3d 1274, 1282 (Fed. Cir. 2007) (explaining that the claim encompassed both mechanical and electronic side impact sensors but did not enable electronic side impact sensors); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 481 F.3d 1371, 1378-79 (Fed. Cir. 2007) (explaining that claim encompassed injectors with and without pressure jackets but did not enable jacketless injectors).

It appears that the enablement dispute here will be resolved by the written-description dispute. If the written description is inadequate, the patent is invalid, and the Court need not reach the enablement issue. If it is in fact adequate, the patent is enabled; the parties do not dispute that the specification teaches one of ordinary skill in the art how to use the integrated guide mechanism with an intravascular blood pump that uses a cable drive mechanism. It does not need to enable other modes of making and using the invention. *See Invitrogen Corp.*, 429 F.3d at 1071 ("Enablement does not require the inventor to foresee every means of implementing an invention at pains of losing his patent franchise."). Summary judgment as to the enablement defense will therefore be denied.

B. Whether the Term "Intravascular Blood Pump Comprising a Cannula" is Invalid for Lack of Written Description

In his expert report, Dr. Dasi opines that claim 1 of the '783 patent is invalid because "the

written description supports only a 'blood pump' connected to a cannula, but not a blood pump that ***includes*** a cannula." (Dkt. No. 387-1 ¶ 345). Maquet moved to strike that invalidity theory because it was not disclosed in Abiomed's contentions. (Dkt. No. 386). It also moved for summary judgment on the theory because no reasonable factfinder could find that "intravascular blood pump" must include a cannula, and that Abiomed sought to improperly elicit opinion testimony on claim construction before the jury.

The Court agreed with Maquet that the theory was untimely and struck the relevant portions of Dr. Dasi's report. (Dkt. No. 540, at 5-6). The motion for summary judgment on this issue is now moot, and it will therefore be dismissed on that basis

C. Whether the Terms "Partially Disposed" and "Elongate Catheter" Are Invalid for Indefiniteness

Maquet has also moved for summary judgment on Abiomed's theories that the terms "partially disposed" in claim 24 and "elongate catheter extending proximally with respect to the intravascular blood pump" in claim 3 are indefinite.

Section 112(b) provides that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention." 35 U.S.C. § 112(b). A patent claim fails to satisfy that requirement and "is invalid for indefiniteness if its claims, read in the light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). That is, "a patent must be precise enough to afford clear notice of what is claimed, thereby apprising the public of what is still open to them." *Id.* at 909 (quotation marks and alterations omitted). Nevertheless, "the definiteness requirement must take into account the inherent limitations of language," for "[s]ome modicum of uncertainty . . . is the 'price of

ensuring the appropriate incentives for innovation.'" *Id.* (quoting *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 732 (2002)). Claim indefiniteness is an issue of law to be decided by the court. *Teva Pharms. USA, Inc.*, 789 F.3d at 1341. Like other invalidity theories, a defendant must prove indefiniteness by clear and convincing evidence. *i4i*, 564 U.S. at 95.

In its opposition, Abiomed represented that it "does not intend to present [the 'partially disposed'] issue to the jury," and thus "this portion of Maquet's motion should be denied as moot." (Dkt. No. 495, at 18). Maquet requests that the Court grant this portion of the motion as Abiomed does not oppose it. (Dkt. No. 507, at 10). The Court will do so.

That leaves the question of whether the claim for an "elongate catheter extending proximally with respect to the intravascular blood pump" is invalid for indefiniteness. First, Abiomed contends the term is indefinite because it could encompass any catheter located proximally to the pump when the specification discloses only catheters extending proximally from the pump to the motor (that is, a motor-catheter-pump assembly). The scope of the claim could include catheters extending from intervening components such as the motor (that is, a catheter-motor-pump assembly). Abiomed's contention thus appears to be that the specification does not support the breadth of the claim. That is properly a written description or enablement argument. *Biosig Instruments, Inc. v. Nautilus, Inc.*, 715 F.3d 891, 902 (Fed. Cir. 2013) (explaining that "objections . . . based on the premise that the . . . patent does not include disclosure sufficiently commensurate with the scope of the claims . . . provide grounds for invalidity under § 112, ¶ 1 and not § 112, ¶ 2"), *vacated on other grounds and remanded*, 572 U.S. 898 (2014), *adhered to on remand*, 783 F.3d 1374 (Fed. Cir. 2015). "Breadth is not indefiniteness." *Id.*

Second, Abiomed asserts that a person of ordinary skill in the art would not understand the scope of the term "extending." It alleges that Maquet's interpretation reads "extending" out of the claim by requiring only that the catheter be proximal to the pump. However, Abiomed does not explain why that makes the term indefinite. The term "extending" does not exist in isolation. Rather, the phrase "extending proximally with respect to" conveys a spatial relationship between the catheter and the pump. (*See* Dkt. No. 443 ¶ 29 ("Dr. Dasi testified 'proximal' is used in medicine to give a 'relative position' and is a 'relative direction terminology.'"); Dkt. No. 248 [Mem. and Order Claim Construction], at 21 n.2 ("The parties do not dispute that 'proximal' in the context of the patent means toward the insertion site of the device into the body."). It is not clear why the possible presence of an intervening component fails to inform a person of skill in the art about that orientation. Nor has Abiomed's expert explained why "extending proximally with respect to" really means "extending proximally from." That the scope of the term encompasses some number of intervening components goes to breadth, not definiteness.

Accordingly, Abiomed cannot prove by clear and convincing evidence that "elongate catheter extending proximally with respect to the intravascular blood pump" is indefinite. The Court will grant Maquet's motion for summary justice as to both indefiniteness issues.

IV. Conclusion

For the foregoing reasons, Maquet's motion for partial summary judgment of no invalidity is DISMISSED as moot as to Abiomed's defense of invalidity based on the lack of written description of the term "intravascular blood pump comprising a cannula" in claim 3; GRANTED as to Abiomed's defense of invalidity based on the indefiniteness of the terms "partially disposed" in claim 24 and "elongate catheter extending proximally with respect to the

intravascular blood pump" in claim 3; and otherwise DENIED.

So Ordered.

/s/ F. Dennis Saylor IV
F. Dennis Saylor IV
United States District Judge

Dated: May 1, 2026