UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

SCHEDULE 14A INFORMATION

Proxy Statement Pursuant to Section 14(a) of the Securities Exchange Act of 1934

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Check the appropriate box:

☐ Preliminary Proxy Statement

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ZAFGEN, INC.
(Name of Registrant as Specified In Its Charter)

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EXPLANATORY NOTE

On Wednesday, December 18, 2019 at 8:30 a.m., Zafgen, Inc. ("Zafgen") and Chondrial Therapeutics, Inc. ("Chondrial") held a conference call in connection with their announcement of the proposed merger of Zafgen and Chondrial, pursuant to the terms of an Agreement and Plan of Merger, dated December 17, 2019, by and between Zafgen, Chondrial, Chondrial Therapeutics Holdings, LLC, the sole stockholder of Chondrial, and Zordich Merger Sub, Inc., a wholly-owned subsidiary of Zafgen (the "Merger Agreement"). The following is the transcript of the conference call:

Zafgen, Inc. (Call with Chondrial Therapeutics, Inc.)

December 18, 2019

Corporate Speakers:

- John Woolford; Westwicke; Managing Director
- Jeff Hatfield; Zafgen, Inc.; CEO
- Carole Ben-Maimon; Chondrial Therapeutics; CEO
- Brian McVeigh; Zafgen, Inc.; CBO
- Patty Allen; Zafgen, Inc.; CFO

Participants:

- Liana Moussatos; Wedbush Securities; Analyst
- Unidentified Participant; Cowen; Analyst

PRESENTATION

Operator^ Good day, ladies and gentlemen, and welcome to Zafgen's Conference Call and Webcast to discuss this definite merger agreement with Chondrial Therapeutics. At this time, all participants are in a listen-only mode.

Later we will conduct a question-and-answer session, and instructions will follow at that time. As a reminder, this conference call is being recorded. I would now like to introduce your host for today's conference, Mr. John Woolford from Westwicke. Mr. Woolford, you may begin.

John Woolford^ Welcome., and thank you for joining us for today's conference call and webcast. Joining us on the call today from Zafgen are Jeff Hatfield, Chief Executive Officer; Brian McVeigh, Chief Business Officer; and Patty Allen, Chief Financial Officer. We are pleased that Dr. Carole Ben-Maimon, Chief Executive Officer of Chondrial Therapeutics, is also with us today.

After management's prepared comments, we will open up the call for questions. Please note in addition to the press release issued this morning to announce the merger we have included presentation slides in the webcast of today's call and posted a PDF of the slides on Zafgen's website. If you've not already done so, I encourage you to open the webcast and/or presentation PDF to follow along with our prepared remarks this morning.

Starting with Slides 2 and 3 before we begin our prepared remarks, I need to remind you that estimates and other forward-looking statements included in this call represent Zafgen's and Chondrial's views as of today, December 18, 2019. Zafgen disclaims any obligation to update these statements to reflect future events or circumstances.

Please refer to today's press release as well as Zafgen's filings with the SEC for information concerning risk factors that could cause actual results to differ materially from those expressed or implied by such statements. I'll now turn the call over to Jeff to begin today's call. Jeff?

Jeff Hatfield^ Thank you, John, and thank you everyone for joining us today to discuss the proposed merger of Zafgen and Chondrial Therapeutics. Before I begin prepared remarks on Slide 4, I just want to say that I'm incredibly pleased that Dr. Carole Ben-Maimon is here with us today.

For those that don't know Carole, she has served as CEO of Chondrial since December 2016. In addition, she brings more than 25 years of experience in the pharmaceutical industry. Prior to Chondrial, she worked with Deerfield Management Company serving as an advisor in the evaluation of investment opportunities in the brand and generic industry.

Prior to working with Deerfield, she was President of Global Pharmaceuticals, a subsidiary Impax Laboratories. Carole has also held leadership roles at several pharmaceutical companies, including Barr Pharmaceuticals and Teva Pharmaceutical Industries. Carole will serve as President and CEO of the combined company.

Now, starting with Slide 4, as many of you know in September 2019 following non-clinical results that we believe were unlikely to resolve the FDA clinical hold on ZGN-1061, Zafgen began evaluating strategic alternatives with our board of directors to maximize shareholder value.

The board conducted an extensive and thorough review through multiple stages of diligence, progressively narrowing the field to arrive at this decision.

We were looking for several key attributes in a potential transaction. These included near-term milestones within 9 to 12 months post transaction, well-funded beyond value inflection milestones, either early-stage, such as IND or Phase 1, or late stage in a pivotal trial for example, and innovative, scientific approach in an attractive field, both patient need and market opportunity especially if focused on rare diseases, and finally a platform opportunity for multiple assets or multiple value streams.

Following our process the Board concluded that this merger with Chondrial represents the highest potential value creation opportunity for Zafgen stockholders. As Chondrial provides a strong profile with respect to each of these criteria. In fact, our Board's decision was unanimous. We're excited about the near term and the long term value creating prospects for the combined company.

Slide 5, highlights the key terms of the merger. Chondrial shareholders will receive shares of newly issued Zafgen shares in a private placement. Following the transaction Chondrial and Zafgen stockholders are expected to own approximately 60% and 40% of the combined company respectfully.

The percentage of the combined company that Chondrial stockholders will own, as of the close of the transaction, is subject to adjustment based on the amount Zafgen's net cash to closing date among other adjustments as described in the merger agreement. We currently expect the transaction to close in the first half of 2020.

The combined company will operate under a new name, Larimar Therapeutics. And assume our NASDAQ listing with a new ticker symbol. The Board of Directors will include four members from Chondrial and three members from Zafgen. As I indicated earlier, Carole will serve as President and CEO of the combined company.

The Board Members of the company will be Peter Barrett, CaroleBen-Maimon, Tom Daniel, Tom Hamilton, Jonathan Leff, Frank Thomas and designee of Deerfield Management. That concludes my prepared remarks on the transaction. Now, I'm delighted to turn the call over to Carole. Carole?

Carole Ben-Maimon^ Thank you, Jeff. And good morning, everyone. I'd like to start by echoing Jeff's excitement for the combined company. It is a transformational event for Chondrial and it will provide us with significant resources to advance our lead asset and progress our pipeline and our platform.

Slide 6, provides a brief introduction to Chondrial. We are clinical stage biotech company with a novel [ph] protein replacement therapy platform to address untreated serious and complex rare diseases.

Our lead candidate is CTI-1601 for which we are also excited to announce today that we recently began dosing in a Phase 1 clinical trial in the United States for the potential treatment of patients with Freidreich's Ataxia.

CTI-1601 is the only Frataxin protein replacement therapy in clinical development today. Nine clinical studies have shown promising results in several models of the disease including heart, brain and muscle function as well as overall survival. I'll provide more details later in my remarks.

Chondrial also has a strong board of directors and leadership team. We have a broad portfolio of I.T. with at least 12 years of market exclusivity expected upon approval. We have also licensed and filed multiple patents around the molecule and efficacy biomarkers.

Finally, Chondrial was created, incubated and funded by Deerfield Management who remains our primary shareholder. I'd like to thank them for their continued support. Turning to slide 7, I'll provide a quick intro on our proprietary protein replacement platform.

Chondrial has demonstrated the ability to design differentiated fusion proteins utilizing various Cell Penetrating Peptides, or CPP. CPPs enable intracellular delivery of bioactive cargoes. This technology is both highly relevant and applicable to a wide range of cargoes and can be used in a number of rare disease indications.

The non-clinical data generated by CTI-1601 has demonstrated the potential of our platform. Before I discussCTI-1601 in detail, I wanted to quickly provide some insights into the devastating disease that Freidreich's Ataxia or F.A. as shown on slide 8.

It is a rare disease caused by a genetic defect resulting in abnormally low levels of protoxen, a protein located in the mitochondrion. The disease affects approximately 5,000 patients in the United States and approximately 10,000 patients in the E.U. It is a progressive, irreversible, systemic disease that affects multiple body systems particularly the brain and the heart.

The age of onset is correlated with severity and speed of progression meaning earlier onset is correlated with more drastic progression. There is often a significant asymptomatic period and the initial symptoms which often appear between ages 10 to 15 may include unsteady posture, frequent falling and progressive difficulty in walking due to impaired ability to coordinate voluntary movements called ataxia.

By the time symptoms occur, heart damage has already normally occurred. As the disease progresses, symptoms worsen and may include the development of advanced lemotaxia often requiring patient confinement to a wheelchair, hypotrophic cardiomyopathy, scoliosis, fatigue, diabetes and hearing loss.

Life expectancy is around 30 to 50 years with early death usually caused by heart disease due to advanced cardiomyopathy. Unfortunately, there is no approved therapy for F.A. and treatment is limited to symptom management. Now turning to our lead candidate. CTI-1601 targeting Freidreich's Ataxia. Slide 9 shows the structure of the fusion protein and the process by which CTI-1601 is understood to deliver for tests into mitochondria.

Initially, a cell penetrating peptide allowsCTI-1601 to cross the cell membrane and then cross the mitochondrial membrane. There, mitochondrial processing peptidase [leads] CTI-1601 at the site shown in the diagram. Then, the mitochondrial targeting sequence and the cell penetrating peptide leads the (inaudible) and the cell. This leads mature, active Frataxin in the cell's mitochondria.

Next, I'll turn to the non-clinical studies that have provided proof of concept forCTI-1601. The results are summarized on slide 10. Thenon-clinical efficacy and pharmacodynamic data to date continue to support the continued development of the product as a method to potentially replace the low levels of Frataxin in patients with Friedreich's ataxia.

These data have shown extended survival and a well-characterized non-clinical model of FA, demonstrated capability of delivering sufficient amounts of Frataxin to mitochondria and so far, CTI-1601 appears to be well tolerated in multiple animal species.

I'll now provide some details on these studies. Slide 11 showsCTI-1601's ability to extend survival in Frataxin-deficient knockout [mice], as well as characterize a well-characterized model of FA. The administration of CTI-1601, 10 milligrams per kilogram subcutaneously every other day, significantly extended the median survival of mice to 166 days versus 98 days per vehicle. The study also confirms that CTI-1601 is capable of delivering sufficient amounts of Frataxin to the mitochondria.

Slide 12 highlights the CTI-1601 is effectively [traffic] to the mitochondria and process into human Frataxin in a mouth model. Importantly, the concentration within the mitochondria increased in a dose-dependent manner.

Succinate dehydrogenase, or SDH activity, a surrogate biomarker for Frataxin activity in mitochondria also increased in a dose- dependent manner, and got to a level seen in (inaudible). Finally, normalization of gene expression in cardiac tissue was also demonstrated.

Moving to slide 13, I wanted to quickly highlightCTI-1601 has been found to be distributed into all tissue we have tested to date. I'm not going to list them all, but as shown on the slide, this includes a significant number of tissues and cell types in multiple animals, models and species.

Now on slide 14, CTI-1601 has shown no systemic clinical or pathological observations related toCTI-1601 in toxicology in two animal species. I also wanted to note that manufacturing efforts for CTI-1601 has been a significant work stream for the company with a successful outcome.

We are currently scaling up our manufacturing, but we have already produced sufficient drug supply, 5gmp batches for the ongoing clinical trials.

Based on the non-clinical data and manufacturing readiness, we recently initiated and began dosing in a Phase I program ofCTI-1601 in the United States as shown on slide 15. The double-blind placebo controlled trial will enroll adult patients, ages 18 and over with Friedreich's ataxia. It is designed to evaluate the safety, tolerability and pharmacokinetics of single, ascending doses of subcutaneously administered CTI-1601.

Top line data from that trial, from Phase I clinical trial are expected by the end of 2020. Chondrial also announced today that the FDA has granted CTI-1601 rare pediatric disease designation or RPD, and fast track designation intended to expedite review and facilitate the development of drugs which have the potential to treat a serious or life threatening condition and fill an unmet medical need.

That concludes my prepared remarks. Again, I am thrilled to be here today and I look forward to the transaction expected in the first half of 2020. I will now turn the call back over to Jeff for closing remarks. Jeff?

Jeff Hatfield^ Thanks Carol. Now turning to slide 16, to conclude our prepared remarks. I'd like to reiterate that the board set out to find the highest potential value creation opportunity for Zafgen stockholders.

After our thorough analysis, Chondrial emerged as the clear choice to both management and our board, as it met all of our key attributes. We believe the combined company Larimar Therapeutics will be a compelling opportunity. And with that, I'd like to now open the line to questions. Operator, can you open the line, please?

QUESTIONS AND ANSWERS

Operator^ Thank you. (Operator Instructions). And our first question comes from Liana Moussatos with Wedbush Securities. Your line is open.

Liana Moussatos^ Hi, thank you for taking my questions. First one is, how did you come up with Larimar Therapeutics?

Carole Ben-Maimon^ Hi, nice to meet you by phone. So, Larimar is actually a rare gemstone, and so we picked it, it's — has beautiful colors and as a rare disease company, we thought a rare gemstone would be an appropriate name.

Liana Moussatos^ Okay. And when does composition of matter expire forCTI-1601?

Carole Ben-Maimon^ There are actually several patents pending, as we speak, on the — on the current molecules, but the patent that we licensed from I.U. and Wake Forest expires in 2024.

Liana Moussatos^ Okay, and can you discuss how that is going to be — and how — you said there's several composition patents? Anything that goes beyond the 12 year or exclusivity? Sorry.

Carole Ben-Maimon^ Yes, so we actually have filed a patent on the current molecule, which is slightly different than the original molecule, and it goes well beyond the 2024 and the 12 year exclusivity.

Liana Moussatos^ Okay. And let's see, can you talk a little bit more about the mechanism of how the peptides get Frataxin into the mitochondria?

Carole Ben-Maimon^ Yes, so it uses a cell penetrating peptide which is actually attached to the mitochondrial target in sequence. And the cell penetrating peptide allows it to diffuse across the cell membrane and across the mitochondrial membranes.

And then there's a naturally occurring mitochondrial processing pepto-base inside the mitochondria that actually cleaves off the mitochondrial targeting sequence in the cell penetrating peptide.

Liana Moussatos^ Okay, do you know why Freidreich's ataxia in the E.U. five than the U.S.?

Carole Ben-Maimon^ Yes, it was actually a Roman disease and it followed pretty much the Roman Empire, so there is a concentration, pretty much anywhere where the British went.

Liana Moussatos^ Okay. Let's see. And, okay, what percent normal levels of Fratexin willCTI-1601 get to?

Carole Ben-Maimon^ That's yet to be seen, we're in the clinic now and we're tracking Frataxin levels and once we have data we'll share it.

Liana Moussatos^ In animal models? Did you get — do you have any idea what the minimum level you have to reach will be?

Carole Ben-Maimon^ So what we know is that heterozygous — so patients — parents of affected children have one gene that's normal and one gene that's not normal. And they have about 50% Frataxin levels, but they are totally healthy. They show absolutely no signs of the disease.

So what we do know is that if you get up above 50%, you're going to be fine. What we don't know is whether a 30%'s enough or 40%'s enough, but that's what we know.

Liana Moussatos^ And will you be able to tell that in phase one?

Carole Ben-Maimon^ We hope to.

Liana Moussatos^ Okay. All right. And you mentioned in the pre-clinical summary that the dosing was subcutaneous every other day, 10 milligrams per kilogram. What will be a human dosing? I know you're probably determined that, but what range are you looking at?

Carole Ben-Maimon^ Yes, we're really waiting until we get data from the P — from the PK data and PD data from the phase one study. But we're definitely looking at subcutaneous dosing and we don't know whether it'll be daily or less frequently.

Liana Moussatos^ Okay. And will it — what's — what is the range of dosing? You had 10 milligram's per kilogram in the animal study.

Carole Ben-Maimon^ Yes, but that doesn't translate into humans. And I don't think…

Liana Moussatos^ What are you going to (inaudible)?

Carole Ben-Maimon^ I'm sorry, what?

Liana Moussatos^ What dose will you start at with humans?

Carole Ben-Maimon^ I don't think we've released that information.

Liana Moussatos^ Okay. All right.

Carole Ben-Maimon^ But we already – but we already did administer our first dose to our first patient.

Liana Moussatos^ Okay. And what is the – okay the patient — I know you have to start with adults for safety. But I'm — what age do you think would have the most benefit of starting initial treatment?

Carole Ben-Maimon^ We don't know the answer to that. Clearly starting earlier in symptomatic patients is going to be better, so getting into children is important. But ultimately, if we're successful you could potentially anticipate starting trying to prevent the disease from even developing because you can do genetic testing, it's just not done because there's no therapy. So I don't really know the answer to what the ideal age is going to be.

Liana Moussatos^ And your — my last question is your five [GMP] batches, will that cover Phase 3?

Carole Ben-Maimon^ No, that will cover all of Phase 1.

Liana Moussatos^ All right, thank you very much.

Jeff Hatfield^ Thanks Liana.

Operator^ Thank you. And our next questions from Yaron Werber, from Cowen, your line is open.

Unidentified Participant^ Hi guys, this is [Brennan] on for Yaron, thanks very much for taking the question. Congrats by the way on the announcement. Just two quick questions from us. In general for the FA patients, what kind of physicians are they typically cared for? Do they usually have a combination of neurologists? Cardiologists? Is there one versus the other that they tend to be more skewed towards? And then I have a question about next year.

Carole Ben-Maimon^ They tend to have a team, but there are certain key opinion leaders throughout the country that see very concentrated groups of patients. So for example CHoP is the center of excellence and sees probably 600 patients a year. So it is a very concentrated physician group.

Unidentified Participant^ Got it. And in terms of actual trial read outs, I know you have mentioned that expect to have [plan] data by the end of next year, do you have any plans for potential interim releases along the way?

And then I guess, not to kind of compound on top of that, what kind of releases would you — do you think to — I guess what kind of measures are you using to include for this? Are you planning to have any kind of biopsy? Really kind of just getting at how are you going to be sure that the [penchant] itself is really getting to the mitochondria in humans? Thanks.

Carole Ben-Maimon^ So we'll be — we will not be doing interim releases primarily because the trials a double blind placebo control trial, so until the data is locked, we wont be looking at it.

That said, we are trying to track Frataxin levels, and I don't think we want to disclose much more than that at this time. But we will be trying to track change in Frataxin level overtime. But remember the first trial is the single ascending dose, so I just want to make — the chances of us seeing much with a single dose is probably not very good, but with multiple ascending doses, there is the potential.

Unidentified Participant^ OK, great. Thanks very much.

Operator^ Thank you, and I'm showing no further questions at this time, I'd like to turn the call back to Mr. Jeff Hatfield for closing remarks.

Jeff Hatfield^ Thank you operator. So, thanks all for participating today, for joining us on this call. Everyone please have happy holidays and a good day today.

Operator^ Ladies and gentlemen this concludes today's conference call, thank you for participating, you may now disconnect, everyone have a great day.

PRESENTATION

Additional Information about the Proposed Merger and Where to Find It

This communication relates to the proposed merger transaction involving Zafgen, and Chondrial and may be deemed to be solicitation material in respect of the proposed merger involving Zafgen and Chondrial. In connection with the proposed merger, Zafgen intends to file relevant materials with the Securities and Exchange Commission (the "SEC"), including a proxy statement relating to the approval of the merger agreement.*Investors and security holders of Zafgen are urged to read these materials when they become available because they will contain important information about Zafgen, Chondrial and the proposed merger*. The proxy statement and other relevant materials (when they become available), and any other documents filed by Zafgen with the SEC, may be obtained free of charge at the SEC web site at www.sec.gov. In addition, investors and security holders may obtain free copies of the documents filed with the SEC by Zafgen by directing a written request to: Zafgen, Inc., 3 Center Plaza, Suite 610, Boston, Massachusetts 02108, Attention: Secretary. Investors and security holders are urged to read the proxy statement and other relevant materials when they become available before making any voting or investment decision with respect to the proposed merger.

This communication shall not constitute an offer to sell or the solicitation of an offer to sell or the solicitation of an offer to buy any securities, nor shall there be any sale of securities in any jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such jurisdiction.

Participants in the Solicitation

Zafgen and its directors and executive officers and Chondrial and its directors and executive officers may be deemed to be participants in the solicitation of proxies from the stockholders of Zafgen in connection with the proposed merger. Information regarding the special interests of these directors and executive officers in the proposed merger will be included in the proxy statement referred to above. Additional information regarding the directors and executive officers of Zafgen is also included in Zafgen's definitive proxy statement in connection with its 2019 Annual Meeting of Stockholders filed with the SEC on April 26, 2019. These documents are available free of charge at the SEC web site (www.sec.gov) and from the Secretary of Zafgen at the address above.

Zafgen Forward-Looking Information is Subject to Risks and Uncertainty

This communication contains forward-looking statements based upon Zafgen's and Chondrial's current expectations. Forward-looking statements involve risks and uncertainties, and include, but are not limited to, statements about the structure, timing and completion of the proposed merger; the combined company's listing on Nasdaq after the closing of the proposed merger; expectations regarding the ownership structure of the combined company; the combined company's expected cash position at the closing of the proposed merger; the future operations of the combined company; the nature, strategy and focus of the combined company; the development and commercial potential and potential benefits of any product candidates of the combined company; the executive and board structure of the combined company; the location of the combined company's corporate headquarters; and other statements that are not historical fact. Actual results and the timing of events may differ materially from those indicated by these forward-looking statements as a result of various important factors, including, without limitation: (i) the risk that the conditions to the closing of the proposed merger are not satisfied, including the failure to timely obtain stockholder approval for the proposed merger, if at all; (ii) uncertainties as to the timing of the consummation of the proposed merger and the ability of each of Zafgen and Chondrial to consummate the proposed merger; (iii) risks related to Zafgen's ability to manage its operating expenses and its expenses associated with the proposed merger pending closing; (iv) risks related to the failure or delay in obtaining required approvals from any governmental or quasi-governmental entity necessary to consummate the proposed merger; (v) the risk that as a result of adjustments to the exchange ratio, Zafgen stockholders and Chondrial stockholders could own more or less of the combined company than is currently anticipated; (vi) risks related to the market price of Zafgen's common stock relative to the exchange ratio; (vii) unexpected costs, charges, expenditures or expenses resulting from the proposed merger; (viii) potential adverse reactions or changes to business relationships resulting from the announcement or completion of the proposed merger; (ix) Zafgen's ability to retain personnel as a result of the announcement or completion of the proposed merger; and (x) risks associated with the possible failure to realize certain anticipated benefits of the proposed merger, including with respect to future financial and operating results. Actual results and the timing of events may differ materially from those anticipated in such forward-looking statements as a result of these risks and uncertainties. These and other risks and uncertainties are more fully described in periodic filings with the SEC, including the factors described in the section entitled "Risk Factors" in Zafgen's Quarterly Report on Form 10-Q for the quarter ended September 30, 2019 filed with the SEC, and in other filings that Zafgen makes and will make with the SEC in connection with the proposed merger, including the proxy statement described above under "Additional Information about the Proposed Merger and Where to Find It." You should not place undue reliance on these forward-looking statements, which apply only as of the date of this communication. Zafgen expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statements contained herein to reflect any change in its expectations with regard thereto or any change in events, conditions or circumstances on which any such statements are based.