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

DIVISION OF
CORPORATION FINANCE

November 9, 2018

Alison Lawton
Chief Executive Officer
Kaleido Biosciences, Inc.
65 Hayden Avenue
Lexington, MA 02421

Re: Kaleido Biosciences, Inc.
Amendment No. 1 to Draft Registration Statement on Form S-1
Submitted October 26, 2018
CIK No. 0001751299

Dear Ms. Lawton:

We have reviewed your amended draft registration statement and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by providing the requested information and either submitting an amended draft registration statement or publicly filing your registration statement on EDGAR. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing the information you provide in response to these comments and your amended draft registration statement or filed registration statement, we may have additional comments.

Amendment No. 1 to Draft Registration Statement on Form S-1 submitted October 26, 2018

Prospectus Summary
Overview, page 1

1. Please revise the first sentence of the first paragraph to clarify that you are a non-IND clinical stage healthcare company.

2. We note your revised disclosure on page 4 that you are conducting ongoing *ex vivo* screening and testing in multi-drug resistant bacteremia in high risk patients but you have not yet identified the specific MMT candidate for this program. Given this

statement, please explain why your pipeline table indicates that you have completed *ex vivo* screening and testing in this program, and revise your disclosure accordingly.

3. We note your response to our prior comment 4 that the company identified a potential MMT candidate for drug or disease-induced diarrhea through *ex vivo* screening and that you have commenced a non-IND human clinical study to support this program and that you are continuing to evaluate further MMT product candidates and have initiated *ex vivo* testing. Please expand footnote 3 to the pipeline table to include such disclosure in your prospectus.

4. Please include a legend explaining the significance of the symbols in the "Mechanism of Action" column with the pipeline table on pages 3 and 111.

5. We note your response to our prior comment 9 that you have discussed with the FDA your plan to move directly to Phase 2 for KB195, and that you will have to independently evaluate each of your other product candidates with respect to bypassing Phase 1. Given the uncertainty, please add a column for Phase 1 to your product pipeline table here and in the Business section. We will not object to narrative disclosure relating to your belief that you may be able to bypass the Phase 1 trial.

Business

Our Approach to Non-IND Human Clinical Studies, page 121

6. We note your response to our prior comment 10 that you do not believe the details of five of your safety and tolerability studies is material. However, if there were any serious adverse events observed in these five human clinical studies, please provide disclosure regarding such events.

Future Pipeline Opportunities, page 140

7. We note your response to our prior comment 24. However, your disclosure relating to the Type 2 diabetes study suggests that it is a relatively advanced non-IND clinical trial and does not explain how this study differs from your other non-IND clinical trials. Please expand your disclosure on page 141 to explain that it is a pilot study, including why it is considered a pilot study and what it is intended to show. Please also state that you have not yet identified a MMT candidate for introduction into the study. Further, although you have not decided at this point whether you will commercialize an MMT candidate or advance the candidate down a drug pathway, please disclose the FDA position that diabetes is not a condition for which medical food can be labeled or marketed so that investors are aware that this is not a possible marketing path.

Certain Relationships and Related Party Transactions, page 185

8. We note your response to our prior comment 17 and that the Midori license agreement is now an agreement between you and a wholly-owned subsidiary. Please clarify whether

Cadena is now the owner of the technology covered by the Midori license agreement. Please also tell us whether there are any continuing obligations between the company and Midori pursuant to the license agreement.

9. We note your response to comment 28 that you believe your services agreement with Flagship Management, your majority stockholder, is immaterial. However, we note your revised disclosure that pursuant to this agreement you have obtained the services of your Chief Innovation Officer, among other services. Please tell us the types of services you currently contract for pursuant to the agreement, including whether you currently contract for, or intend in the future to contract for, the services of any of your executive officers or directors.

You may contact Keira Nakada at 202-551-3659 or Jim Rosenberg at 202-551-3679 if you have questions regarding comments on the financial statements and related matters. Please contact Irene Paik at 202-551-6553 or Erin Jaskot at 202-551-3442 with any other questions.

Sincerely,

Division of Corporation Finance
Office of Healthcare & Insurance

cc: Kingsley L. Taft - Goodwin Procter LLP