Filed Pursuant to Rule 424(b)(5)
Registration No. 333-221350

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee(1)
Common Stock, $0.001 par value per share	$75,000,000	$9,338

(1) Calculated in accordance with Rule 457(o) under the Securities Act of 1933, as amended. This "Calculation of Registration Fee" table shall be deemed to update the "Calculation of Registration Fee" table in the registrant's Registration Statement on Form S-3 (File No. 333-221350) in accordance with Rules 456(b) and 457(r) under the Securities Act of 1933, as amended.

PROSPECTUS

$75,000,000

Common Stock

We have entered into a Sales Agreement, or the Sales Agreement, with Cantor Fitzgerald & Co., dated November 3, 2017, relating to shares of our common stock, par value $0.001 per share, offered by this prospectus. In accordance with the terms of the sales agreement, we may offer and sell shares of our common stock having an aggregate offering price of up to $75,000,000 from time to time through Cantor Fitzgerald & Co., acting as agent.

Our common stock is listed on the Nasdaq Capital Market under the symbol "CYTK." On November 2, 2017, the last reported sale price of our common stock on the Nasdaq Capital Market was $12.88 per share.

Sales of our common stock, if any, under this prospectus will be made in sales deemed to be "at the market offerings" as defined in Rule 415 promulgated under the Securities Act of 1933, as amended, or the Securities Act. Cantor Fitzgerald & Co. is not required to sell any specific amount of securities, but will act as our sales agent using commercially reasonable efforts consistent with its normal trading and sales practices, on mutually agreed terms between Cantor Fitzgerald & Co. and us. There is no arrangement for funds to be received in any escrow, trust or similar arrangement.

The compensation to Cantor Fitzgerald & Co. for sales of common stock sold pursuant to the sales agreement will be an amount up to 3.0% of the aggregate gross proceeds from each sale of shares of common stock sold under the sales agreement. In connection with the sale of the common stock on our behalf, Cantor Fitzgerald & Co. will be deemed to be an "underwriter" within the meaning of the Securities Act and the compensation of Cantor Fitzgerald & Co. will be deemed to be underwriting commissions or discounts. We have also agreed to provide indemnification and contribution to Cantor Fitzgerald & Co. with respect to certain liabilities, including liabilities under the Securities Act or the Exchange Act of 1934, as amended.

Our business and an investment in our common stock involve significant risks. These risks are described under the caption "Risk Factors" beginning on page 4 of this prospectus supplement and in the documents incorporated by reference into this prospectus supplement.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is November 3, 2017.

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ABOUT THIS PROSPECTUS

This prospectus is part of an automatic registration statement that we filed with the Securities and Exchange Commission, or SEC, using a "shelf" registration process as a "well-known seasoned issuer" as defined in Rule 405 under the Securities Act of 1933, as amended, or the Securities Act. Under this shelf registration statement, we may offer shares of our common stock having an aggregate offering price of up to $75,000,000 from time to time at prices and on terms to be determined by market conditions at the time of offering.

Before buying any of the common stock that we are offering, we urge you to carefully read this prospectus, together with the information incorporated by reference as described under the headings "Where You Can Find More Information" and "Incorporation of Certain Information by Reference" in this prospectus, and any free writing prospectus or prospectus supplement that we have authorized for use in connection with this offering. These documents contain important information that you should consider when making your investment decision.

This prospectus describes the terms of this offering of common stock and also adds to and updates information contained in the documents incorporated by reference into this prospectus. To the extent there is a conflict between the information contained in this prospectus, on the one hand, and the information contained in any document incorporated by reference into this prospectus that was filed with the SEC before the date of this prospectus, on the other hand, you should rely on the information in this prospectus. If any statement in one of these documents is inconsistent with a statement in another document having a later date — for example, a document incorporated by reference into this prospectus — the statement in the document having the later date modifies or supersedes the earlier statement.

Except as otherwise indicated herein or as the context otherwise requires, references in this prospectus to "Cytokinetics," "the company," "we," "us," "our" and similar references refer to Cytokinetics, Incorporated and its consolidated subsidiaries.

This prospectus and the information incorporated herein by reference include trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus, any applicable prospectus supplement or any related free writing prospectus are the property of their respective owners.

SUMMARY

This summary highlights selected information contained elsewhere in this prospectus or incorporated by reference herein and does not contain all of the information that you need to consider in making your investment decision. You should carefully read the entire prospectus any related free writing prospectus, including the risks of investing in our securities discussed under the heading "Risk Factors" contained in this prospectus and any related free writing prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus. You should also carefully read the information incorporated by reference into this prospectus, including our financial statements and related notes, and the exhibits to the registration statement of which this prospectus is a part, before making your investment decision.

Cytokinetics, Incorporated

Overview

We are a late-stage biopharmaceutical company focused on the discovery and development of first-in-class muscle activators as potential treatments for debilitating diseases in which muscle performance is compromised and/or declining. Our research and development activities relating to the biology of muscle function have evolved from our expertise regarding the cytoskeleton, a complex biological infrastructure that plays a fundamental role within every human cell. Our most advanced research and development programs relate to the biology of muscle function and are directed to small molecule modulators of the contractility of skeletal or cardiac muscle. We are also conducting earlier-stage research directed to compounds with the potential to modulate muscle contractility and other muscle functions.

Our lead drug candidate from our skeletal muscle contractility program, tirasemtiv, is a fast skeletal troponin activator, or FSTA. Tirasemtiv has been granted orphan drug designation and fast track status by the U.S. Food and Drug Administration, or FDA, and orphan medicinal product designation by the European Medicines Agency, or EMA, in each case for the potential treatment of amyotrophic lateral sclerosis, or ALS. We expect results from VITALITY-ALS (**V**entilatory **I**nvestigation of **T**irasemtiv and **A**ssessment of **L**ongitudinal **I**ndices after **T**reatment for a **Y**ear in **ALS**), a phase 3 clinical trial for tirasemtiv in patients with ALS in the fourth quarter of 2017.

We retain exclusive rights to tirasemtiv, subject to an option for a potential license that is held by Astellas Pharma Inc., or Astellas. We are continuing the development of tirasemtiv at our own expense to support potential regulatory approval in the U.S., EU and other jurisdictions. If Astellas exercises its option, we will grant Astellas an exclusive license to develop and commercialize tirasemtiv outside our commercialization territory of North America, Europe and other select countries. Each company would then be primarily responsible for the further development of tirasemtiv in its territory and have the exclusive right to commercialize tirasemtiv in its territory. If Astellas exercises its option, we will receive from Astellas an option exercise payment and a milestone payment associated with our initiation of the open-label extension trial for tirasemtiv (**V**entilatory **I**nvestigations in **G**lobal **O**pen-Label **R**esearch in **ALS**, or VIGOR-ALS). In addition, the companies will share future development costs of tirasemtiv in North America, Europe and certain other countries, and Astellas will be responsible for development costs of tirasemtiv specific to its commercialization territory. Contingent upon the successful development of tirasemtiv, we may receive additional milestone payments. If tirasemtiv is commercialized, Astellas will pay us royalties on sales of tirasemtiv in Astellas' territory, and we will pay Astellas royalties on sales of tirasemtiv in our territory.

We are also developing CK-2127107, a structurally distinct, next-generation FSTA, under a strategic alliance with Astellas. In December 2015, we started a Phase 2 clinical trial of CK-2127107 in patients with spinal muscular atrophy, or SMA. We anticipate that the trial will complete enrollment in 2017 and we will report data in Q1 2018. In July 2017, in collaboration with Astellas, we started FORTITUDE-ALS (**F**unctional **O**utcomes in a **R**andomized **T**rial of **I**nvestigational **T**reatment with CK-2127107 to **U**nderstand **D**ecline in **E**ndpoints – in **ALS**), a Phase 2 clinical trial of CK-2127107 in patients with ALS. CK-2127107 is also being evaluated for the potential use in other indications associated with muscle weakness. Astellas started a Phase 2 clinical trial of CK-2127107 in patients with chronic obstructive pulmonary disease, or COPD, in June 2016 and started a Phase 1b clinical trial of CK-2127107 in elderly patients with limited mobility in the second quarter of 2017. We are also conducting joint research with Astellas directed to next-generation skeletal muscle activators.

Astellas holds an exclusive license to develop and commercialize CK-2127107 worldwide, subject to our development and commercialization participation rights. Under our collaboration with Astellas, we are eligible for reimbursement of certain research and development expenses and additional research and development milestone payments. If Astellas commercializes CK-2127107 or other collaboration products, we will receive royalties on sales of such products. We could receive additional commercial milestone payments provided certain sales targets are met. We can also co-fund certain development costs for CK-2127107 in exchange for increased milestone payments and royalties. We retain an option to co-promote CK-2127107 in which case Astellas will reimburse us for certain expenses associated with our co-promotion activities.

Our lead drug candidate from our cardiac muscle contractility program, omecamtiv mecarbil, is a novel cardiac muscle myosin activator that is being developed as a potential treatment for heart failure under a strategic alliance with Amgen Inc., or Amgen. Amgen is conducting GALACTIC-HF (**G**lobal **A**pproach to **L**owering **A**dverse **C**ardiac Outcomes **T**hrough **I**mproving **C**ontractility in **H**eart **F**ailure) is a Phase 3 cardiovascular outcomes clinical trial of omecamtiv mecarbil, in collaboration with Cytokinetics. GALACTIC-HF is being conducted under a Special Protocol Assessment with the FDA. We are also planning to conduct a potential exercise performance/ cardiac function clinical trial. Amgen will reimburse us for our out-of-pocket development costs associated with this clinical trial. We are also conducting joint research with Amgen directed to next-generation cardiac muscle activators.

Amgen holds an exclusive, worldwide license to omecamtiv mecarbil and related compounds, subject to our specified development and commercialization rights. Under our agreement with Amgen, we are eligible for potential pre-commercialization and commercialization milestone payments on omecamtiv mecarbil and royalties that escalate based on increasing levels of annual net sales. Amgen has also entered an alliance with Les Laboratoires Servier, or Servier, for exclusive commercialization rights relating to omecamtiv mecarbil in Europe as well as the Commonwealth of Independent States, including Russia. Servier contributes funding for development and provides strategic support to the program.

The Company provided notice to Amgen of its exercise of its option under the Amgen Agreement to co-invest in the Phase 3 development program of omecamtiv mecarbil in exchange for an incremental royalty from Amgen on increasing worldwide sales of omecamtiv mecarbil outside Japan. Exercising our option and co-funding affords us the right to co-promote omecamtiv mecarbil in institutional care settings in North America, with reimbursement by Amgen for certain sales force activities.

Company Information

We were incorporated in Delaware in August 1997 as Cytokinetics, Incorporated. We conduct our administration, finance, business development, clinical development, commercial development, quality assurance and regulatory affairs activities primarily from our headquarters located at 280 East Grand Avenue, South San Francisco, California. Our general telephone number at that address is (650) 624-3000 and our website is www.cytokinetics.com. The information on, or that can be accessed through, our website is not incorporated by reference in this prospectus, and you should not consider it to be a part of this prospectus. Our website address is included as an inactive textual reference only.

THE SECURITIES WE MAY OFFER

Common stock offered by us	Shares of our common stock, par value $0.001 per share, with an aggregate sale price of up to $75,000,000.
Common stock to be outstanding after this offering	Up to 59,685,598 shares, assuming the sale of 5,822,981 shares of our common stock in this offering at a public offering price of $12.88 per share, which was the last reported sale price of our common stock on the Nasdaq Capital Market on November 2, 2017. The actual number of shares issued will vary depending on the sales price under this offering.
Manner of offering	"At-the-market" offering that may be made from time to time through or to Cantor Fitzgerald & Co., as sales agent and/or principal. See "Plan of Distribution" on page 13.
Use of proceeds	We intend to use the net proceeds from this offering, if any, to fund our clinical trials and for working capital and general corporate purposes. We may also use a portion of the net proceeds to in-license, acquire, or invest in additional businesses, technologies, products, or assets, though we currently have no specific agreements, commitments or understanding with respect to any in-licensing acquisitions. See "Use of Proceeds" on page 8.
Risk factors	Investment in our securities involves a high degree of risk. You should read the "Risk Factors," beginning on page 4 of this prospectus and in the documents incorporated by reference into this prospectus for a discussion of factors to consider before deciding to purchase shares of our common stock.
Nasdaq Capital Market Symbol:	"CYTK"

The number of our shares of common stock outstanding after this offering is based on 53,862,617shares of common stock outstanding as of September 30, 2017, and excludes as of such date:

- 100,106 shares of common stock issuable upon the exercise of warrants outstanding, with a weighted average exercise price of $6.74 per share;
- 6,020,336 shares of common stock issuable upon the exercise of options outstanding with a weighted-average exercise price of $9.17 per share;
- 458,752 restricted and performance stock units outstanding; and
- 4,222,088 shares reserved for future issuance under our stock option plans and employee purchase plans.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before deciding whether to invest in our common stock, you should consider carefully the risks and uncertainties described below and under the heading "Risk Factors" contained in our most recent Annual Report on Form 10-K and most recent Quarterly Report on Form 10-Q, which are incorporated by reference into this prospectus in their entirety, as updated or superseded by the risks and uncertainties described under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus, together with the other information in this prospectus, the documents incorporated by reference and any free writing prospectus that we may authorize for use in connection with this offering. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the section below titled "Forward-Looking Statements."

Additional Risks Related to This Offering

Management will have broad discretion as to the use of the proceeds from this offering, and may not use the proceeds effectively.

Because we have not designated the amount of net proceeds from this offering to be used for any particular purpose, our management will have broad discretion as to the application of the net proceeds from this offering and could use them for purposes other than those contemplated at the time of the offering. Our management may use the net proceeds for corporate purposes that may not improve our financial condition or market value.

You may experience immediate and substantial dilution.

The offering price per share in this offering may exceed the net tangible book value per share of our common stock outstanding prior to this offering. Assuming that an aggregate of 5,822,981 shares of our common stock are sold at a price of $12.88 per share, the last reported sale price of our common stock on the Nasdaq Capital Market on November 2, 2017, for aggregate gross proceeds of $75.0 million, and after deducting commissions and estimated offering expenses payable by us, you will experience immediate dilution of $0.95 per share, representing the difference between our as adjusted net tangible book value per share as of September 30, 2017 after giving effect to this offering and the assumed offering price. The exercise of outstanding stock options and warrants will result in further dilution of your investment. See the section titled "Dilution" below for a more detailed illustration of the dilution you would incur if you participate in this offering.

FORWARD-LOOKING STATEMENTS

This prospectus, including the documents that we incorporate by reference herein, contains, and any free writing prospectus including the documents we incorporate by reference therein may contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, about us and our industry that involve substantial risks and uncertainties. All statements, other than statements of historical facts contained in this prospectus, including the documents that we incorporate by reference herein, and any free writing prospectus including the documents we incorporate by reference therein, including statements regarding our future financial condition, business strategy and plans, and objectives of management for future operations, are forward-looking statements. In some cases you can identify these statements by forward-looking words such as "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "could," "would," "project," "plan," "expect" or the negative or plural of these words or similar expressions. These forward-looking statements include, but are not limited to, statements concerning the following:

- guidance concerning revenues, research and development expenses and general and administrative expenses for 2017;
- the sufficiency of existing resources to fund our operations for at least the next 12 months;
- our capital requirements and needs for additional financing;

- the initiation, design, conduct, enrollment, progress, timing and scope of clinical trials and development activities for our drug candidates conducted by ourselves or our partners, Amgen Inc., or Amgen, and Astellas Pharma Inc., or Astellas, including the anticipated timing for initiation of clinical trials, anticipated rates of enrollment for clinical trials and anticipated timing of results becoming available or being announced from clinical trials;
- the results from the clinical trials, the nonclinical studies, and chemistry, manufacturing, and controls, or CMC, activities of our drug candidates and other compounds, and the significance and utility of such results;
- anticipated interactions with regulatory authorities;
- the further development of tirasemtiv for the potential treatment of amyotrophic lateral sclerosis, or ALS;
- the expected acceptability by regulatory authorities of the effects of tirasemtiv on slow vital capacity or other measures of clinical benefit related to respiratory function in patients with ALS as Phase 3 clinical trial endpoints to support the registration of tirasemtiv as a treatment for ALS;
- our and our partners' plans or ability to conduct the continued research and development of our drug candidates and other compounds;
- the further development of omecamtiv mecarbil for the potential treatment of heart failure;
- our expected roles in research, development, or commercialization under our strategic alliances with Amgen and Astellas;
- the properties and potential benefits of, and the potential market opportunities for, our drug candidates and other compounds, including the potential indications for which they may be developed;
- the sufficiency of the clinical trials conducted with our drug candidates to demonstrate that they are safe and efficacious;
- our receipt of milestone payments, royalties, reimbursements, and other funds from current or future partners under strategic alliances, such as with Amgen or Astellas;
- our ability to continue to identify additional potential drug candidates that may be suitable for clinical development;
- our plans or ability to commercialize drugs with or without a partner, including our intention to develop sales and marketing capabilities;
- the focus, scope, and size of our research and development activities and programs;
- the utility of our focus on the biology of muscle function, and our ability to leverage our experience in muscle contractility to other muscle functions;
- our ability to protect our intellectual property and to avoid infringing the intellectual property rights of others;
- future payments and other obligations under loan and lease agreements;
- potential competitors and competitive products;
- retaining key personnel and recruiting additional key personnel;
- the potential impact of recent accounting pronouncements on our financial position or results of operations; and
- the anticipated use of proceeds of this offering.

Such forward-looking statements involve risks and uncertainties, including, but not limited to:

- further clinical development of tirasemtiv for the potential treatment of ALS will require significant additional funding and we may be unable to obtain such additional funding on acceptable terms, if at all;
- the FDA and/or other regulatory authorities may not accept effects on respiratory function, including slow vital capacity, as appropriate clinical trial endpoints to support the registration of tirasemtiv for the treatment of ALS;
- Amgen's decisions with respect to the timing, design and conduct of research and development activities for omecamtiv mecarbil and other cardiac muscle activators, including decisions to postpone or discontinue research or development activities relating to omecamtiv mecarbil and other cardiac muscle activators;
- Astellas' decisions with respect to the timing, design and conduct of research and development activities for CK-2127107 and other skeletal muscle activators, including decisions to postpone or discontinue research or development activities relating to CK-2127107 and other skeletal muscle activators, as well as Astellas' decision with respect to its option to enter into a global collaboration for the development and commercialization of tirasemtiv;
- our ability to enter into strategic partnership agreements for any of our programs on acceptable terms and conditions or in accordance with our planned timelines;
- our ability to obtain additional financing on acceptable terms, if at all;
- our receipt of funds and access to other resources under our current or future strategic alliances;
- difficulties or delays in the development, testing, manufacturing, or commercialization of our drug candidates;
- difficulties or delays, or slower than anticipated patient enrollment, in our or partners' clinical trials;
- difficulties or delays in the manufacture and supply of clinical trial or commercial materials;
- failure by our contract research organizations, contract manufacturing organizations, and other vendors to properly fulfill their obligations or otherwise perform as expected;
- results from nonclinical studies that may adversely impact the timing or the further development of our drug candidates and other compounds;
- the possibility that the FDA or foreign regulatory agencies may delay or limit our or our partners' ability to conduct clinical trials or may delay or withhold approvals for the manufacture and sale of our products;
- changing standards of care and the introduction of products by competitors or alternative therapies for the treatment of indications we target that may limit the commercial potential of our drug candidates;
- difficulties or delays in achieving market access and reimbursement for our drug candidates and the potential impacts of health care reform;
- changes in laws and regulations applicable to drug development, commercialization, or reimbursement;
- the uncertainty of protection for our intellectual property, whether in the form of patents, trade secrets, or otherwise;
- potential infringement or misuse by us of the intellectual property rights of third parties;
- activities and decisions of, and market conditions affecting, current and future strategic partners;
- accrual information provided by our contract research organizations, contract manufacturing organizations, and other vendors;
- potential ownership changes under Internal Revenue Code Section 382; and

- the timeliness and accuracy of information filed with the SEC by third parties.

These statements reflect our current views with respect to future events and are based on assumptions and are subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss in greater detail many of these risks under the heading “Risk Factors” contained in this prospectus, in any free writing prospectuses we may authorize for use in connection with a specific offering, and in our most recent annual report on Form 10-K and in our most recent quarterly report on Form 10-Q, as well as any amendments thereto reflected in subsequent filings with the SEC. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statement. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements. You should read this prospectus together with the documents we have filed with the SEC that are incorporated by reference and any free writing prospectus that we may authorize for use in connection with this offering completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

USE OF PROCEEDS

The amount of proceeds from this offering will depend upon the number of shares of our common stock sold and the market price at which they are sold. There can be no assurance that we will be able to sell any shares under or fully utilize the sales agreement with Cantor Fitzgerald & Co. as a source of financing. We intend to use the net proceeds, if any, from this offering for working capital and general corporate purposes, which may include, among other things, funding research and development, clinical trials, vendor payables, potential regulatory submissions, hiring additional personnel and capital expenditures. We may also use a portion of the net proceeds to in-license, acquire, or invest in additional businesses, technologies, or products, or assets, though we currently have no specific agreements, commitments, or understandings with respect to any in-licensing or acquisitions.

The amounts and timing of our actual expenditures will depend on numerous factors, including our development and commercialization efforts, as well as the amount of cash used in our operations. We therefore cannot estimate with certainty the amount of net proceeds to be used for the purposes described above. We may find it necessary or advisable to use the net proceeds for other purposes, and we will have broad discretion in the application of the net proceeds. Pending the uses described above, we plan to invest the net proceeds from this offering in short-term, investment-grade, interest-bearing securities.

DILUTION

Our net tangible book value as of September 30, 2017 was approximately $147.0 million, or $2.73 per share. Net tangible book value per share is determined by dividing our total tangible assets, less total liabilities, by the number of shares of our common stock outstanding as of September 30, 2017. Dilution with respect to net tangible book value per share represents the difference between the amount per share paid by purchasers of shares of common stock in this offering and the net tangible book value per share of our common stock immediately after this offering.

After giving effect to the assumed sale of 5,822,981 shares of our common stock in this offering at an assumed offering price of $12.88 per share, the last reported sale price of our common stock on the Nasdaq Capital Market on November 2, 2017, and after deducting estimated offering commissions and estimated offering expenses payable by us, our as adjusted net tangible book value as of September 30, 2017 would have been approximately $219.4 million, or $3.68 per share. This represents an immediate increase in net tangible book value of $0.95 per share to existing stockholders and immediate dilution of $9.20 per share to investors purchasing our common stock in this offering at the public offering price. The following table illustrates this dilution on a per share basis:

Assumed public offering price per share		$12.88
Net tangible book value per share of as September 30, 2017	$2.73	
Increase in net tangible book value per share attributable to this offering	$0.95	
As adjusted net tangible book value per share as of September 30, 2017, after giving effect to this offering		$ 3.68
Dilution per share to new investors purchasing our common stock in this offering		$ 9.20

The table above assumes for illustrative purposes that an aggregate of 5,822,981 shares of our common stock are sold during the term of the sales agreement with Cantor Fitzgerald & Co. at a price of $12.88 per share, the last reported sale price of our common stock on the Nasdaq Capital Market on November 2, 2017, for aggregate gross proceeds of $75 million. The shares subject to the sales agreement with Cantor Fitzgerald & Co. are being sold from time to time at various prices. An increase of $1.00 per share in the price at which the shares are sold from the assumed offering price of $12.88 per share shown in the table above, assuming all of our common stock in the aggregate amount of $75 million during the term of the sales agreement with Cantor Fitzgerald & Co. is sold at that price, would increase our adjusted net tangible book value per share after the offering to $3.77 per share and would increase the dilution in net tangible book value per share to new investors in this offering to $10.11 per share, after deducting commissions and estimated aggregate offering expenses payable by us. A decrease of $1.00 per share in the price at which the shares are sold from the assumed offering price of $12.88 per share shown in the table above, assuming all of our common stock in the aggregate amount of $75 million during the term of the sales agreement with Cantor Fitzgerald & Co. is sold at that price, would decrease our adjusted net tangible book value per share after the offering to $3.58 per share and would decrease the dilution in net tangible book value per share to new investors in this offering to $8.30 per share, after deducting commissions and estimated offering expenses payable by us. This information is supplied for illustrative purposes only and may differ based on the actual offering price and the actual number of shares offered.

The above discussion and table are based on 53,862,617 shares outstanding as of September 30, 2017, and exclude as of that date:

- 100,106 shares of common stock issuable upon the exercise of warrants outstanding, with a weighted average exercise price of $6.74 per share;
- 6,020,336 shares of common stock issuable upon the exercise of options outstanding with a weighted-average exercise price of $9.17 per share;
- 458,752 restricted and performance stock units outstanding; and
- 4,222,088 shares reserved for future issuance under our stock option plans and employee purchase plans.

To the extent that options outstanding as of September 30, 2017 have been or may be exercised or other shares issued, investors purchasing our common stock in this offering may experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

DESCRIPTION OF CAPITAL STOCK

As of the date of this prospectus, our authorized capital stock consists of 173,000,000 shares. Those shares consist of 163,000,000 shares designated as common stock, $0.001 par value, and 10,000,000 shares designated as preferred stock, $0.001 par value. As of September 30, 2017, there were 53,862,617 shares of common stock issued and outstanding.

The following is a summary description of the material terms of our capital stock. The description of capital stock is intended as a summary and is qualified in its entirety by reference to our certificate of incorporation and our bylaws.

Common Stock

Voting Rights

Holders of common stock are entitled to one vote for each share held of record on all matters submitted to a vote of stockholders. Upon any liquidation, dissolution or winding up of our business, the holders of common stock are entitled to share equally in all assets available for distribution after payment of all liabilities and provision for liquidation preference of shares of preferred stock then outstanding. Holders of common stock have no preemptive rights or rights to convert their common stock into any other securities. There are no redemption or sinking fund provisions applicable to the common stock. Holders of common stock are entitled to receive dividends declared by the board of directors, out of funds legally available for the payment of dividends, subject to the rights of holders of preferred stock. Currently, we are not paying dividends.

Our common stock is listed on the Nasdaq Capital Market under the symbol “CYTK.” The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. Computershare Trust Company, N.A.’s address is 250 Royall Street, Canton, Massachusetts 02021.

All outstanding shares of common stock are fully paid and non-assessable, and all shares of common stock offered by this prospectus, or issuable upon conversion or exercise of securities, will, when issued, be validly issued and fully paid and non-assessable.

Preferred Stock

Pursuant to our certificate of incorporation, our board of directors has the authority, without further approval by our stockholders, to designate and issue up to 10,000,000 shares of preferred stock in one or more series. Our board of directors previously designated 8,070 of the authorized shares of preferred stock as Series A convertible preferred stock, and 23,026 of the authorized shares of preferred stock as Series B convertible preferred stock, none of which are currently outstanding. Our board of directors may designate the powers, preferences and rights, and the qualifications, limitations or restrictions of each series of preferred stock, including dividend rights, dividend rate, conversion rights, voting rights, rights and terms of redemption (including sinking fund provisions), redemption price or prices, and liquidation preferences, any or all of which may be greater than the rights of the common stock. Thus, without stockholder approval, our board of directors could authorize the issuance of preferred stock with voting, conversion and other rights that could dilute the voting power and other rights of holders of our common stock, and may have the effect of decreasing the market price of the common stock.

Anti-Takeover Effects of Some Provisions of Delaware Law

Provisions of Delaware law and our certificate of incorporation and our bylaws could make the acquisition of our company through a tender offer, a proxy contest or other means more difficult and could make the removal of incumbent officers and directors more difficult. We expect these provisions to discourage coercive takeover practices and inadequate takeover bids and to encourage persons seeking to acquire control of our company to first negotiate with our board of directors. We believe that the benefits provided by our ability to negotiate with the proponent of an unfriendly or unsolicited proposal outweigh the disadvantages of discouraging these proposals. We believe the negotiation of an unfriendly or unsolicited proposal could result in an improvement of its terms.

We are subject to Section 203 of the Delaware General Corporation Law, an anti-takeover law. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years following the date the person became an interested stockholder, unless:

- prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;

- the stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding (a) shares owned by persons who are directors and also officers, and (b) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or subsequent to the date of the transaction, the business combination is approved by the board and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66% of the outstanding voting stock which is not owned by the interested stockholder.

Generally, a "business combination" includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. An "interested stockholder" is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of a corporation's outstanding voting securities. We expect the existence of this provision to have an anti-takeover effect with respect to transactions our board of directors does not approve in advance. We also anticipate that Section 203 may also discourage attempts that might result in a premium over the market price for the shares of common stock held by stockholders.

Anti-Takeover Effects of Provisions of Our Charter Documents

Our certificate of incorporation provides for our board of directors to be divided into three classes serving staggered terms. Approximately one-third of the board of directors will be elected each year. The provision for a classified board could prevent a party who acquires control of a majority of the outstanding voting stock from obtaining control of the board of directors until the second annual stockholders meeting following the date the acquirer obtains the controlling stock interest. The classified board provision could discourage a potential acquirer from making a tender offer or otherwise attempting to obtain control of our company and could increase the likelihood that incumbent directors will retain their positions. Our certificate of incorporation provides that directors may be removed with cause by the affirmative vote of the holders of the outstanding shares of common stock.

Our bylaws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to the board of directors. At an annual meeting, stockholders may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the board of directors. Stockholders may also consider a proposal or nomination by a person who was a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has given to our Secretary timely written notice, in proper form, of his or her intention to bring that business before the meeting. The bylaws do not give the board of directors the power to approve or disapprove stockholder nominations of candidates or proposals regarding other business to be conducted at a special or annual meeting of the stockholders. However, our bylaws may have the effect of precluding the conduct of business at a meeting if the proper procedures are not followed. These provisions may also discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of our company.

Under Delaware law, a special meeting of stockholders may be called by the board of directors or by any other person authorized to do so in the certificate of incorporation or the bylaws. Our bylaws authorize a majority of the authorized directors on our board of directors, the chairperson of the board, the chief executive officer, the president or the secretary to call a special meeting of stockholders.

Because our stockholders do not have the right to call a special meeting, a stockholder could not force stockholder consideration of a proposal over the opposition of the board of directors by calling a special meeting of stockholders prior to such time as a majority of the board of directors believed or the chief executive officer believed the matter should be considered or until the next annual meeting provided that the requestor met the notice requirements. The restriction on the ability of stockholders to call a special meeting means that a proposal to replace the board also could be delayed until the next annual meeting.

Delaware law provides that stockholders may execute an action by written consent in lieu of a stockholder meeting. However, Delaware law also allows us to eliminate stockholder actions by written consent. Elimination of written consents of stockholders may lengthen the amount of time required to take stockholder actions since actions by written consent are not subject to the minimum notice requirement of a stockholder's meeting. However, we believe that the elimination of stockholders' written consents may deter hostile takeover attempts. Without the availability of stockholder's actions by written consent, a holder controlling a majority of our capital stock would not be able to amend our bylaws or remove directors without holding a stockholders' meeting. The holder would have to obtain the consent of a majority of the board of directors, the

chairman of the board or the chief executive officer to call a stockholders' meeting and satisfy the notice periods determined by the board of directors. Our certificate of incorporation provides for the elimination of actions by written consent of stockholders.

Listing

Our common stock is listed on the Nasdaq Capital Market under the symbol "CYTK."

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. The transfer agent and registrar's address is 250 Royall Street, Canton, Massachusetts 02021.

PLAN OF DISTRIBUTION

We have entered into the Sales Agreement with Cantor Fitzgerald & Co., under which we may issue and sell from time to time up to $75,000,000 of our common stock through Cantor Fitzgerald & Co. as our sales agent. Sales of our common stock, if any, will be made at market prices by any method that is deemed to be an "at the market" offering as defined in Rule 415 under the Securities Act, including sales made directly on the Nasdaq Capital Market or any other trading market for our common stock. If authorized by us in writing, Cantor Fitzgerald & Co. may purchase shares of our common stock as principal.

Cantor Fitzgerald & Co. will offer our common stock subject to the terms and conditions of the Sales Agreement on a daily basis or as otherwise agreed upon by us and Cantor Fitzgerald & Co. We will designate the maximum amount of common stock to be sold through Cantor Fitzgerald & Co. on a daily basis or otherwise determine such maximum amount together with Cantor Fitzgerald & Co. Subject to the terms and conditions of the Sales Agreement, Cantor Fitzgerald & Co. will use its commercially reasonable efforts to sell on our behalf all of the shares of common stock requested to be sold by us. We may instruct Cantor Fitzgerald & Co. not to sell common stock if the sales cannot be effected at or above the price designated by us in any such instruction. Cantor Fitzgerald & Co. or we may suspend the offering of our common stock being made through Cantor Fitzgerald & Co. under the Sales Agreement upon proper notice to the other party. Cantor Fitzgerald & Co. and we each have the right, by giving written notice as specified in the Sales Agreement, to terminate the Sales Agreement in each party's sole discretion at any time.

The aggregate compensation payable to Cantor Fitzgerald & Co. as sales agent equals up to 3.0% of the aggregate gross proceeds from each sale of shares of common stock sold through it pursuant to the Sales Agreement. We have also agreed to reimburse Cantor Fitzgerald & Co. up to $50,000 of Cantor Fitzgerald & Co.'s actual out-of-pocket expenses incurred by Cantor Fitzgerald & Co. in connection with this offering. We estimate that the total expenses of the offering payable by us, excluding commissions payable to Cantor Fitzgerald & Co. under the Sales Agreement, will be approximately $350,000.

The remaining sales proceeds, after deducting any expenses payable by us and any transaction fees imposed by any governmental, regulatory, or self-regulatory organization in connection with the sales, will equal our net proceeds for the sale of such common stock.

Cantor Fitzgerald & Co. will provide written confirmation to us following the close of trading on the Nasdaq Capital Market on each day in which common stock is sold through it as sales agent under the Sales Agreement. Each confirmation will include the number of shares of common stock sold through it as sales agent on that day, the volume weighted average price of the shares sold, the percentage of the daily trading volume and the net proceeds to us.

We will report at least quarterly the number of shares of common stock sold through Cantor Fitzgerald & Co. under the Sales Agreement, the net proceeds to us and the compensation paid by us to Cantor Fitzgerald & Co. in connection with the sales of common stock.

Settlement for sales of common stock will occur, unless the parties agree otherwise, on the second business day that is also a trading day following the date on which any sales were made in return for payment of the net proceeds to us. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

In connection with the sales of our common stock on our behalf, Cantor Fitzgerald & Co. may be deemed to be an "underwriter" within the meaning of the Securities Act, and the compensation paid to Cantor Fitzgerald & Co. may be deemed to be underwriting commissions or discounts. We have agreed in the Sales Agreement to provide indemnification and contribution to Cantor Fitzgerald & Co. against certain liabilities, including liabilities under the Securities Act. As sales agent, Cantor Fitzgerald & Co. will not engage in any transactions that stabilizes our common stock.

Our common stock is listed on the Nasdaq Capital Market and trades under the symbol "CYTK." The transfer agent of our common stock is Computershare Trust Company, N.A.

Cantor Fitzgerald & Co. and/or its affiliates have provided, and may in the future provide, various investment banking and other financial services for us for which services they have received and, may in the future receive, customary fees.

LEGAL MATTERS

Cooley LLP will pass upon the validity of the securities offered by this prospectus. Latham & Watkins LLP, San Diego, California, is counsel for Cantor Fitzgerald in connection with this offering.

EXPERTS

The financial statements and management's assessment of the effectiveness of internal control over financial reporting (which is included in Management's Report on Internal Control over Financial Reporting) incorporated in this prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2016 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus is part of a registration statement we filed with the SEC. This prospectus does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. You should rely only on information contained in this prospectus or incorporated by reference into this prospectus. We have not authorized any person to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front page of this prospectus, regardless of the time of delivery of this prospectus or any sale of the securities offered by this prospectus.

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any document we file with the SEC at the SEC's public reference room at 100 F Street, N.E., Washington, D.C., 20549. Please call the SEC at 1.800.SEC.0330 for further information on the operation of the public reference room. Our SEC filings are also available to the public at the SEC's website at http://www.sec.gov.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents instead of having to repeat the information in this prospectus. The information incorporated by reference is considered to be part of this prospectus, and later information that we file with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings (including those made after the date of the initial filing of the registration statement of which this prospectus is a part and prior to the effectiveness of such registration statement) we will make with the SEC under Sections 13(a), 13(c), 14, or 15(d) of the Exchange Act until the termination of the offering of the shares covered by this prospectus (other than information furnished under Item 2.02 or Item 7.01 of Form 8-K):

- our Annual Report on Form 10-K for the year ended December 31, 2016, which was filed with the SEC on March 6, 2017 (the "Form 10-K");
- the information specifically incorporated by reference into the Form 10-K from our definitive proxy statement on Schedule 14A which was filed with the SEC on March 31, 2017;
- our Quarterly Reports on Form 10-Q for the quarter ended March 31, 2017, which was filed with the SEC on May 4, 2017, for the quarter ended June 30, 2017, which was filed with the SEC on August 4, 2017 and for the quarter ended September 30, 2017, which was filed with the SEC on November 3, 2017;
- our Current Reports on Form 8-K filed with the SEC on February 2, 2017, March 2, 2017, March 20, 2017, March 22, 2017, March 23, 2017, March 29, 2017, April 4, 2017, May 9, 2017, May 15, 2017, May 19, 2017, June 29, 2017 (two filings), July 5, 2017, July 27, 2017, August 2, 2017, September 19, 2017, October 31, 2017 and November 6, 2017;
- our Current Reports on Form 8-K filed with the SEC on February 16, 2017, April 27, 2017, August 2, 2017 and October 26, 2017 (in each case, as to information therein explicitly filed with the SEC only); and
- the description of our common stock in our registration statement on Form 8-A filed with the SEC on March 12, 2004, including any amendments thereto or reports filed for the purposes of updating this description.

We also incorporate by reference any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of such registration statement, until we file a post-effective amendment that indicates the termination of the offering of the shares of our common stock made by this prospectus and will become a part of this prospectus from the date that such documents are filed with the SEC. Information in such future filings updates and supplements the information provided in this prospectus. Any statements in any such future filings will automatically be deemed to modify and supersede any information in any document we previously filed with the SEC that is incorporated or deemed to be incorporated herein by reference to the extent that statements in the later filed document modify or replace such earlier statements.

You can request a copy of these filings, at no cost, by writing or telephoning us at the following address or telephone number:

Cytokinetics, Incorporated
280 East Grand Avenue
South San Francisco, California 94080
United States of America
Attn: Investor Relations
(650) 624-3000

Up to $75,000,000

Common Stock

PROSPECTUS SUPPLEMENT

November 3, 2017