



Cytokinetics Announces Baseline Data From First Cohort of Phase 2 Clinical Trial of CK-2127107 in Patients With SMA

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Patient Demographics Presented at Cure SMA 2017 Annual SMA Conference

SOUTH SAN FRANCISCO, Calif., July 05, 2017 (GLOBE NEWSWIRE) -- Cytokinetics, Inc. (Nasdaq:CYTK) today announced that data relating to patient baseline characteristics and the reasons for patient screen failure, both from the first cohort of the Phase 2 clinical trial of CK-2127107 in spinal muscular atrophy (SMA), were presented at the Cure SMA 2017 Annual SMA Conference in Orlando, FL by Stacy Rudnicki, M.D., Director, Clinical Research at Cytokinetics. In collaboration with Astellas Pharma Inc. (TSE:4503) ("Astellas"), Cytokinetics is developing CK-2127107 as a potential treatment for people living with SMA and certain other debilitating diseases and conditions associated with skeletal muscle weakness and/or fatigue.

Patients enrolled in Cohort 1 of this Phase 2, hypothesis-generating, double-blind, randomized, placebo-controlled clinical trial were on average 27.7 years of age (SD: 13.81) and had symptom onset 22.2 years prior to enrollment (SD: 12.25) with a confirmed diagnosis 11.6 years before enrollment (SD: 6.25). Of the 39 patients enrolled in Cohort 1, 54 percent were male; 19 patients were ambulatory (all with SMA Type III), and 20 patients were non-ambulatory (five with Type II and 15 with SMA Type III). With respect to respiratory measurements, patients had on average a forced vital capacity (FVC) of 84 percent of predicted (min, max: 42, 127), a maximal expiratory pressure (MEP) of 88.7 cm H₂O (min, max: 34, 196), and a maximal inspiratory pressure (MIP) of -99.4 cm H₂O (min, max: -228, -29).

In terms of motor measurements at baseline, ambulatory patients had an average score of 48.8 (min, max: 37, 54) in the Hammersmith Functional Motor Scale Expanded (HFMSSE), 39.2 (min, max: 26, 41) in the Revised Upper Limb Module (RULM), 17.7 (min, max: 9, 35) seconds in the timed-up-and-go, and 290.7 (min, max: 138, 426) meters in the six-minute walk. Non-ambulatory patients scored 18.9 (min, max: 10, 50) in the HFMSSE, and 28.0 (min, max: 17, 41) in the RULM. The HFMSSE ranges from 0 to 66 points, with higher scores indicating a greater degree of function.

Screen failures in Cohort 1 were primarily due to a HFMSSE score that was either too high in ambulatory patients or too low in non-ambulatory patients. There were no statistically significant differences otherwise in the baseline demographics of enrolled patients compared to screen failures.

"The baseline demographics we observed in Cohort 1 are consistent with our expectations for the patient population targeted in this first Phase 2 clinical trial of CK-2127107," said Fady I. Malik, MD, PhD, Cytokinetics' Executive Vice President of Research & Development. "Adolescent and adult patients with SMA have previously had limited opportunities to participate in clinical trials and we are pleased to be gaining real-world insights into how to optimize design and inclusion criteria for future trials that may enroll this growing patient population."

Clinical Trial Design

The primary objective of this Phase 2, double-blind, randomized, placebo-controlled clinical trial is to determine the potential pharmacodynamic effects of a suspension formulation of CK-2127107 following multiple oral doses in patients with Type II, Type III, or Type IV SMA. Secondary objectives are to evaluate the safety, tolerability and pharmacokinetics of CK-2127107. There is no single primary endpoint in this hypothesis-generating trial.

The trial is designed to enroll 18 ambulatory (Type III or Type IV) and 18 non-ambulatory (Type II or Type III) patients 12 years of age and older in Cohort 1, randomized 2:1 to receive 150 mg of CK-2127107 or placebo dosed twice daily for eight weeks, stratified by ambulatory versus non-ambulatory status. The second cohort of patients will receive 450 mg of CK-2127107 or placebo, also stratified by ambulatory versus non-ambulatory status and dosed twice daily for eight weeks.

Multiple assessments of skeletal muscle function and fatigability are performed, including respiratory assessments, upper limb strength and functionality for non-ambulatory patients, as well as six-minute walk and timed-up-and-go for ambulatory patients. Patients enrolled in the second cohort will also be assessed with the SMA Health Index, a patient reported outcome measure. Additional information can be found at www.clinicaltrials.gov.

About CK-2127107

Skeletal muscle contractility is driven by the sarcomere, the fundamental unit of skeletal muscle contraction. It is a highly ordered cytoskeletal structure composed of several key proteins. Skeletal muscle myosin is the motor protein that converts chemical energy into mechanical force through its interaction with actin. A set of regulatory proteins, which includes tropomyosin and several types of troponin, make the actin-myosin interaction dependent on changes in intracellular calcium levels. CK-2127107, a novel skeletal muscle activator arising from Cytokinetics' skeletal muscle contractility program, slows the rate of calcium release from the regulatory troponin complex of fast skeletal muscle fibers, which sensitizes the sarcomere to calcium, leading to an increase in skeletal muscle contractility. CK-2127107 has demonstrated pharmacological activity that may lead to new therapeutic options for diseases associated with muscle weakness and fatigue. In non-clinical models of SMA, a skeletal muscle activator has demonstrated increases in submaximal skeletal muscle force and power in response to neuronal input and delays in the onset and reductions in the degree of muscle fatigue. CK-2127107 has been the subject of five completed Phase 1 clinical trials in healthy volunteers, which evaluated the safety, tolerability, bioavailability, pharmacokinetics and pharmacodynamics of the drug candidate. In addition to the Phase 2 clinical trial in patients with SMA, Cytokinetics is collaborating with Astellas on the conduct of a Phase 2 clinical trial in patients with chronic obstructive pulmonary disease (COPD). Astellas also recently began a Phase 1b clinical trial of CK-2127107 in elderly adults with limited mobility.

About SMA

SMA is a severe neuromuscular disease that occurs in 1 in every 6,000 to 10,000 live births each year and is one of the most common potentially fatal genetic disorders. Spinal muscular atrophy manifests in various degrees of severity as progressive muscle weakness resulting in respiratory and mobility impairment. There are four types of SMA, named for age of initial onset of muscle weakness and related symptoms: Type I (Infantile), Type II (Intermediate), Type III (Juvenile) and Type IV (Adult onset). Life expectancy and disease severity vary by type of SMA. Type I patients have the worst prognosis, with a life expectancy of no more than 2 years; Type IV patients may have a normal life span but eventually suffer gradual weakness in the proximal muscles of the extremities, eventually resulting in mobility issues. Few treatment options exist for these patients, resulting in a high unmet need for new therapeutic options to address symptoms and modify disease progression.

About Cytokinetics and Astellas Collaboration

In 2013, Astellas and Cytokinetics formed a partnership focused on the research, development, and commercialization of skeletal muscle activators. The primary objective of the collaboration is to advance novel therapies for diseases and medical conditions associated with muscle impairment and weakness. Under the collaboration, Cytokinetics exclusively licensed to Astellas rights to co-develop and potentially co-commercialize CK-2127107, a fast skeletal muscle troponin activator (FSTA), in non-neuromuscular indications. In 2014, Astellas and Cytokinetics agreed to expand the collaboration to include certain neuromuscular indications, including SMA, and to advance CK-2127107 into Phase 2 clinical development, initially in SMA. Under the agreement as further amended in 2016, Astellas has exclusive rights to co-develop and commercialize CK-2127107 and other FSTAs in non-neuromuscular indications and certain neuromuscular indications (including SMA and ALS) and other novel mechanism skeletal muscle activators in all indications, subject to certain Cytokinetics' development and commercialization rights; Cytokinetics may co-promote and conduct certain commercial activities in North America and Europe under agreed scenarios.

About Cytokinetics

Cytokinetics is a late-stage biopharmaceutical company focused on discovering, developing and commercializing first-in-class muscle activators as potential treatments for debilitating diseases in which muscle performance is compromised and/or declining. As a leader in muscle biology and the mechanics of muscle performance, the company is developing small molecule drug candidates specifically engineered to increase muscle function and contractility. Cytokinetics' lead drug candidate is *tirasemtiv*, a fast skeletal muscle troponin activator (FSTA). *Tirasemtiv* is the subject of VITALITY-ALS, an international Phase 3 clinical trial in patients with ALS. *Tirasemtiv* has been granted orphan drug designation and fast track status by the U.S. Food and Drug Administration and orphan medicinal product designation by the European Medicines Agency for the potential treatment of ALS. Cytokinetics is preparing for the potential commercialization of *tirasemtiv* in North America and Europe and has granted an option to Astellas for development and commercialization in other countries. Cytokinetics is collaborating with Astellas to develop CK-2127107, a next-generation FSTA. CK-2127107 has been granted orphan drug designation by the FDA for the potential treatment of SMA. CK-2127107 is the subject of two ongoing Phase 2 clinical trials enrolling patients with spinal muscular atrophy and chronic obstructive pulmonary disease. Astellas is also conducting a Phase 1b clinical trial of CK-2127107 in elderly adults with limited mobility. Cytokinetics is collaborating with Amgen Inc. ("Amgen") to develop *omecamtiv mecarbil*, a novel cardiac muscle activator. *Omecamtiv mecarbil* is the subject of GALACTIC-HF, an international Phase 3 clinical trial in patients with heart failure. Amgen holds an exclusive worldwide license to develop and commercialize *omecamtiv mecarbil* with a sublicense held by Servier for commercialization in Europe and certain other countries. Astellas holds an exclusive worldwide license to develop and commercialize CK-2127107. Licenses held by Amgen and Astellas are subject to Cytokinetics' specified co-development and co-commercialization rights. For additional information about Cytokinetics, visit <http://www.cytokinetics.com/>.

Forward-Looking Statements

This press release contains forward-looking statements for purposes of the Private Securities Litigation Reform Act of 1995 (the "Act"). Cytokinetics disclaims any intent or obligation to update these forward-looking statements, and claims the protection of the Act's Safe Harbor for forward-looking statements. Examples of such statements include, but are not limited to, statements relating to Cytokinetics' and its partners' research and development activities; the design, results, significance and utility of preclinical study results; and the properties and potential benefits of Cytokinetics' drug candidates. Such statements are based on management's current expectations, but actual results may differ materially due to various risks and uncertainties, including, but not limited to, potential difficulties or delays in the development, testing, regulatory approvals for trial commencement, progression or product sale or manufacturing, or production of Cytokinetics' drug candidates that could slow or prevent clinical development or product approval, including risks that current and past results of clinical trials or preclinical studies may not be indicative of future clinical trial results, patient enrollment for or conduct of clinical trials may be difficult or delayed, Cytokinetics' drug candidates may have adverse side effects or inadequate therapeutic efficacy, the FDA or foreign regulatory agencies may delay or limit Cytokinetics' or its partners' ability to conduct clinical trials, and Cytokinetics may be unable to obtain or maintain patent or trade secret protection for its intellectual property; Astellas' decisions with respect to the design, initiation, conduct, timing and continuation of development activities for CK-2127107; Cytokinetics may incur unanticipated research and development and other costs or be unable to obtain additional financing necessary to conduct development of its products; standards of care may change, rendering Cytokinetics' drug candidates obsolete; competitive products or alternative therapies may be developed by others for the treatment of indications Cytokinetics' drug candidates and potential drug candidates may target; and risks and uncertainties relating to the timing and receipt of payments from its partners, including milestones and royalties on future potential product sales under Cytokinetics' collaboration agreements with such partners. For further information regarding these and other risks related to Cytokinetics' business, investors should consult Cytokinetics' filings with the Securities and Exchange Commission.

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