Rocket Pharmaceuticals Presents Positive Data from LV Hematology and AAV Cardiovascular Gene Therapy Programs at the 26th Annual Meeting of the American Society of Gene and Cell Therapy (ASGCT)

May 19, 2023

Robust and sustained efficacy in both adult PKD patients up to 30 months post-RP-L301; first pediatric patient results suggest efficacy similar to adult cohort with initial greater than five-point increase in hemoglobin

Sustained genetic correction observed in eight of 12 evaluable Fanconi Anemia patients, and phenotypic correction and concomitant hematologic stabilization observed in seven of 12 patients 12-42 months after RP-L102 in Phase 2 pivotal trial

100% overall survival at 12 months post-RP-L201 and favorable safety profile for all LAD-I patients with 12-24 months of follow-up

Robust preclinical proof of concept studies showed RP-A601 for PKP2-ACM decreased arrhythmias and increased survival

CRANBURY, N.J.--(BUSINESS WIRE)--May 19, 2023-- Rocket Pharmaceuticals, Inc. (NASDAQ: RCKT), a leading late-stage biotechnology company advancing an integrated and sustainable pipeline of genetic therapies for rare disorders with high unmet need, today announced positive data from the Pyruvate Kinase Deficiency (PKD), Fanconi Anemia, Severe Leukocyte Adhesion Deficiency-I (LAD-I) and Danon Disease clinical programs and PKP2-arrhythmogenic cardiomyopathy (PKP2-ACM) preclinical program presented at the 26th Annual Meeting of the American Society of Gene and Cell Therapy (ASGCT) in Los Angeles, California.

“I am pleased that we continue to deliver outstanding clinical results that highlight the momentum across both our LV hematology and AAV cardiovascular platforms,” said Jonathan Schwartz, M.D., Chief Gene Therapy Officer, Rocket Pharma. “The first pediatric PKD patient in our Phase 1 trial demonstrated initial hemoglobin increase of more than five points, and additional patients in our pivotal Fanconi Anemia trial have demonstrated robust engraftment and hematologic stabilization. All patients in the LAD-I pivotal trial continue to demonstrate improvements in clinical parameters. Regarding RP-A501, as of May 2023, all six patients with ongoing follow-up in the Danon Phase 1 trial continue to demonstrate improvements or stabilization at a time when these patients would most likely experience progressive disease or death.”

Dr. Schwartz continued, “In addition, after recently receiving IND clearance from the FDA, we are excited to present robust preclinical proof of concept data from our PKP2-ACM program for the first time at a scientific meeting. PKP2-ACM is a devastating disease that is a frequent cause of sudden cardiac death and represents a significant unmet need given the limited and non-curative treatment options available to patients. Our data demonstrate decreased arrhythmias, improved cardiac structure and function, and increased survival; these results, and our rapid advancement to the first clinical gene therapy trial for PKP2-ACM, showcase our proven and consistent ability to elevate gene therapy research and our dedication to bringing these therapies to patients who need them most.”

Global Phase 1 Study Results of Lentiviral Mediated Gene Therapy for Severe Pyruvate Kinase Deficiency (PKD)

The oral presentation includes positive updated data (cut-off May 3, 2023) from two adult patients followed up to 30 months and encouraging early data from the first pediatric patient treated with RP-L301, Rocket’s *ex vivo* lentiviral gene therapy candidate for Pyruvate Kinase Deficiency (PKD).

- Robust and sustained efficacy in both adult patients up to 30 months post-infusion demonstrated by normalized hemoglobin (from baseline levels in the 7.0-7.5 g/dL range), improved hemolysis parameters, and red blood cell transfusion independence.
- Both adult patients reported improved quality of life with documented improvements via formal quality of life assessments.
- The safety profile appears highly favorable, with no RP-L301-related serious adverse events in either of the adult patients. Previously reported transient transaminase elevation seen in both adult subjects post conditioning and infusion with no clinical stigmata of liver injury have fully resolved.
- Insertion site analyses in peripheral blood and bone marrow in both adult patients through 24 months post-RP-L301

demonstrated highly polyclonal patterns and there has been no evidence of insertional mutagenesis.
- First pediatric results suggest similar efficacy as observed in long-term efficacy data in the adult cohort.
    - The first pediatric patient infusion of RP-L301 was well tolerated, with engraftment achieved at day +15, hospital discharge less than one month following infusion, and no RP-L301-related serious adverse events.
    - Hemoglobin normalized six weeks post-infusion and measured 13.4 g/dL at eight weeks (from median baseline of 7.9 g/dL). There were no red blood cell transfusion requirements following engraftment.
- Adult and pediatric enrollment is completed in the Phase 1 study. Phase 2 pivotal trial initiation is anticipated in the fourth quarter of 2023.

Lentiviral-Mediated Gene Therapy for Fanconi Anemia [Group A]: Results from Global RP-L102 Clinical Trials

The oral presentation includes positive, updated data (cut-off April 17, 2023) from the ongoing Phase 2 pivotal trial of RP-L102, Rocket's *ex vivo* lentiviral gene therapy candidate for Fanconi Anemia (FA).

- RP-L102 conferred sustained genetic correction in eight of 12 evaluable patients and comprehensive phenotypic correction in seven of 12 evaluable patients with ≥12 months of follow up as demonstrated by increased resistance to mitomycin-C (MMC) in bone marrow (BM)-derived colony forming cells and hematologic stabilization.
- The safety profile of RP-L102 remains highly favorable with no significant safety signals, and the treatment, administered without any cytotoxic conditioning, continues to be well tolerated. No signs of bone marrow dysplasia, clonal dominance or insertional mutagenesis related to RP-L102 have been observed.
    - Polyclonal integration patterns have been observed in each of the seven patients with phenotypic, genetic, and hematologic evidence of engraftment.
- Pivotal trial enrollment and treatment have been completed, and the final two patients have been treated with commercial drug product in preparation for launch.
- Based on the positive efficacy and safety data from the Phase 2 pivotal FA trial, Rocket anticipates filing the Biologics License Application (BLA) with the FDA in the fourth quarter of 2023.

Autologous Ex Vivo Lentiviral Gene Therapy for Pediatric Patients with Severe Leukocyte Adhesion Deficiency-I (LAD-I): Interim Results from an Ongoing Phase 1/2 Study

The poster presentation includes positive, updated top-line data (cut-off November 2, 2022) at 12 to 24 months of follow-up after RP-L201 infusion for all nine patients. RP-L201 is Rocket's *ex vivo* lentiviral gene therapy candidate for severe Leukocyte Adhesion Deficiency-I (LAD-I).

- Observed 100% overall survival at 12 months post-infusion via Kaplan Meier estimate for all nine LAD-I patients with 12 to 24 months of available follow-up. Data also showed evidence of resolution of LAD-I-related skin rash and restoration of wound repair capabilities.
- The safety profile of RP-L201 was highly favorable in all patients with no RP-L201-related serious adverse events to date. Adverse events related to other study procedures, including busulfan conditioning, have been previously disclosed and are consistent with the safety profiles of those agents and procedures.
- Based on the positive efficacy and safety data from the Phase 2 pivotal LAD-I trial, Rocket anticipates filing the Biologics License Application (BLA) with the FDA during this second quarter of 2023.

Danon Disease Phase 1 RP-A501 Results: The First Single-Dose Intravenous (IV) Gene Therapy with Recombinant Adeno-Associated Virus (AAV9:LAMP2B) for a Monogenic Cardiomyopathy

The spotlight oral presentation includes positive, previously disclosed data (cut-off July 11, 2022) in patients followed for up to 36 months in the ongoing Phase 1 clinical trial of RP-A501, Rocket's investigational AAV gene therapy for Danon Disease. The presentation includes data from patients treated with the low dose (6.7×10^{13} GC/kg) in the pediatric (n=2) and adolescent/young adult (n=3) cohorts, and the high-dose (1.1×10^{14} GC/kg) adolescent/young adult cohort (n=2).

- As previously disclosed, RP-A501 was associated with favorable safety at the low dose with an appropriate immunomodulatory regimen. There have been no RP-A501-related or steroid-related serious adverse events reported to date in the pediatric cohort.
- Efficacy results continue to demonstrate sustained improvement or stabilization in all patients with preserved left ventricular systolic function at time of treatment (n=6, across all cohorts) across key clinical, biomarker, echocardiographic, and quality of life parameters.
- Improvement or stabilization of disease progression in these patients treated with RP-A501, as measured by natriuretic peptides, is in direct contrast to progressive worsening observed over three to 30 months in patients in the prospective natural history study.
- As of the presentation, all six patients that remain in follow-up continue to show signs of improvement or stabilization; additional follow-up data to be provided at a future date.
- The Phase 2 pivotal trial of RP-A501 for Danon Disease remains on track for initiation during this second quarter of 2023.

Preclinical Efficacy of AAVrh.74-PKP2a (RP-A601): Gene Therapy for PKP2-associated Arrhythmogenic Cardiomyopathy

The late-breaking abstract presentation includes robust preclinical proof of concept for RP-A601, Rocket's investigational AAV gene therapy for the treatment of arrhythmogenic cardiomyopathy due to plakophilin 2 pathogenic variants (PKP2-ACM), a devastating inherited heart disease that can lead to life-threatening arrhythmias, cardiac structural abnormalities, and sudden cardiac death. PKP2-ACM affects approximately 50,000 people in the U.S. and Europe.

- The current standard of care for patients with PKP2-ACM consists of medical therapy, implantable cardioverter defibrillators (ICDs), and ablations, which are not curative. Even with treatment, life-threatening arrhythmias and progression of disease still occur.

- Preclinical proof of concept from a translationally relevant animal model has been demonstrated following Rocket-sponsored studies with academic partners. The preclinical studies with a cardiomyocyte-specific PKP2 knockout mouse model of ACM evaluated initial proof of concept and dose-related effects of AAV vectors (RP-A601), including survival, functional and anatomic benefits. Notably, the studies evaluated the delivery of RP-A601 at seven- and 14-days following induction of PKP2 knockout and subsequent disease onset.
- Results demonstrated increased survival and preserved cardiac function in the PKP2 knockout mouse model following administration of RP-A601.
    - 100% of adult PKP2 knockout mice receiving RP-A601 seven days after knockout induction demonstrated survival to the five-month duration of evaluation, compared to 100% mortality by approximately day 50 in PKP2 knockout mice receiving formulation control. PKP2 knockout mice receiving RP-A601 displayed preserved ejection fraction and right ventricular area at 28 days, sustained to five months.
    - Fourteen days following RP-A601 administration, PKP2 knockout mice demonstrated robust survival with a similar degree of cardiac benefit through five months. RP-A601 was also associated with mitigation of isoproterenol-induced premature ventricular contractions (PVCs) and arrhythmias, which are major morbidity components of ACM.

- Based on robust preclinical proof of concept that has demonstrated decreased arrhythmias and increased survival and the completion of extensive IND-enabling toxicology studies, Rocket has received IND clearance from the FDA for a Phase 1 study of RP-A601 that will assess the impact of RP-A601 on PKP2 myocardial protein expression, cardiac biomarkers, and clinical predictors of life-threatening ventricular arrhythmias and sudden cardiac death.
- Rocket is initiating Phase 1 study start-up activities and rapidly advancing the first investigational gene therapy for PKP2-ACM into the clinic.

About Pyruvate Kinase Deficiency

Pyruvate Kinase Deficiency (PKD) is a rare, monogenic red blood cell disorder resulting from a mutation in the *PKLR* gene encoding for the pyruvate kinase enzyme, a key component of the red blood cell glycolytic pathway. Mutations in the *PKLR* gene result in increased red blood cell destruction and the disorder ranges from mild to life-threatening anemia. PKD has an estimated prevalence of 4,000 to 8,000 patients in the U.S. and Europe. Children are the most commonly and severely affected subgroup of patients. Patients with PKD have a high unmet medical need, as currently available treatments include splenectomy and red blood cell transfusions, which are associated with immune defects and chronic iron overload. Recently, mitapivat, an oral enzyme activator, was approved for use in adult patients, however its efficacy is limited in more severely-afflicted patients, most notably in those who are splenectomized, transfusion-dependent, or whose disease results from deleterious mutations.

RP-L301 was in-licensed from the Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Centro de Investigación Biomédica en Red de Enfermedades Raras (CIBERER) and Instituto de Investigación Sanitaria de la Fundación Jiménez Díaz (IIS-FJD).

About Fanconi Anemia

Fanconi Anemia (FA) is a rare pediatric disease characterized by bone marrow failure, malformations, and cancer predisposition. The primary cause of death among patients with FA is bone marrow failure, which typically occurs during the first decade of life. Allogeneic hematopoietic stem cell transplantation (HSCT), when available, corrects the hematologic component of FA, but requires myeloablative conditioning. Graft-versus-host disease, a known complication of allogeneic HSCT, is associated with an increased risk of solid tumors, mainly squamous cell carcinomas of the head and neck region. Approximately 60-70% of patients with FA have a Fanconi Anemia complementation group A (*FANCA*) gene mutation, which encodes for a protein essential for DNA repair. Mutations in the *FANCA* gene leads to chromosomal breakage and increased sensitivity to oxidative and environmental stress. Increased sensitivity to DNA-alkylating agents such as mitomycin-C (MMC) or diepoxybutane (DEB) is a 'gold standard' test for FA diagnosis. Somatic mosaicism occurs when there is a spontaneous correction of the mutated gene that can lead to stabilization or correction of a FA patient's blood counts in the absence of any administered therapy. Somatic mosaicism, often referred to as 'natural gene therapy' provides a strong rationale for the development of FA gene therapy because of the selective growth advantage of gene-corrected hematopoietic stem cells over FA cells. There is a high unmet medical need for patients with FA.

About Leukocyte Adhesion Deficiency-I

Severe Leukocyte Adhesion Deficiency-I (LAD-I) is a rare, autosomal recessive pediatric disease caused by mutations in the *ITGB2* gene encoding for the beta-2 integrin component CD18. CD18 is a key protein that facilitates leukocyte adhesion and extravasation from blood vessels to combat infections. As a result, children with severe LAD-I are often affected immediately after birth. During infancy, they suffer from recurrent life-threatening bacterial and fungal infections that respond poorly to antibiotics and require frequent hospitalizations. Children who survive infancy experience recurrent severe infections including pneumonia, gingival ulcers, necrotic skin ulcers, and septicemia. Without a successful bone marrow transplant, mortality in patients with severe LAD-I is 60-75% prior to the age of 2 and survival beyond the age of 5 is uncommon. There is a high unmet medical

need for patients with severe LAD-I.

Rocket's LAD-I research is made possible by a grant from the California Institute for Regenerative Medicine (Grant Number CLIN2-11480). The contents of this press release are solely the responsibility of Rocket and do not necessarily represent the official views of CIRM or any other agency of the State of California.

About Danon Disease

Danon Disease is a rare X-linked inherited disorder caused by mutations in the gene encoding lysosome-associated membrane protein 2 (LAMP-2), an important mediator of autophagy. This results in accumulation of autophagosomes and glycogen, particularly in cardiac muscle and other tissues, which ultimately leads to heart failure, and for male patients, frequent death during adolescence or early adulthood. It is estimated to have a prevalence of 15,000 to 30,000 patients in the U.S. and Europe. The only available treatment option for Danon Disease is cardiac transplantation, which is associated with substantial complications and is not considered curative. There are no specific therapies available for the treatment of Danon Disease. There is a high unmet medical need for patients with Danon Disease.

About PKP2-Arrhythmogenic Cardiomyopathy (PKP2-ACM)

PKP2-ACM is an inherited heart disease caused by mutations in the *PKP2* gene and characterized by life-threatening ventricular arrhythmias, cardiac structural abnormalities, and sudden cardiac death. PKP2-ACM affects approximately 50,000 adults and children in the U.S. and Europe. Patients living with PKP2-ACM have an urgent unmet medical need, as current medical, implantable cardioverter defibrillator (ICD), and ablation therapies do not consistently prevent disease progression or arrhythmia recurrence, are associated with significant morbidity including inappropriate shocks and device and procedure-related complications, and do not address the underlying pathophysiology or genetic mutation. RP-A601 is being investigated as a one-time, potentially curative gene therapy treatment that may improve survival and quality of life for patients affected by this devastating disease.

About Rocket Pharmaceuticals, Inc.

Rocket Pharmaceuticals, Inc. (NASDAQ: RCKT) is advancing an integrated and sustainable pipeline of investigational genetic therapies designed to correct the root cause of complex and rare disorders. The Company's platform-agnostic approach enables it to design the best therapy for each indication, creating potentially transformative options for patients afflicted with rare genetic diseases. Rocket's clinical programs using lentiviral vector (LV) based gene therapy are for the treatment of Fanconi Anemia (FA), a difficult to treat genetic disease that leads to bone marrow failure and potentially cancer, Leukocyte Adhesion Deficiency-I (LAD-I), a severe pediatric genetic disorder that causes recurrent and life-threatening infections which are frequently fatal, and Pyruvate Kinase Deficiency (PKD), a rare, monogenic red blood cell disorder resulting in increased red cell destruction and mild to life-threatening anemia. Rocket's first clinical program using adeno-associated virus (AAV)-based gene therapy is for Danon Disease, a devastating, pediatric heart failure condition. Rocket also has preclinical AAV-based gene therapy programs in PKP2-arrhythmogenic cardiomyopathy (ACM) and BAG3-associated dilated cardiomyopathy (DCM). For more information about Rocket, please visit www.rocketpharma.com.

Rocket Cautionary Statement Regarding Forward-Looking Statements

Various statements in this release concerning Rocket's future expectations, plans and prospects, including without limitation, Rocket's expectations regarding the safety and effectiveness of product candidates that Rocket is developing to treat Fanconi Anemia (FA), Leukocyte Adhesion Deficiency-I (LAD-I), Pyruvate Kinase Deficiency (PKD), Danon Disease (DD) and other diseases, the expected timing and data readouts of Rocket's ongoing and planned clinical trials, the expected timing and outcome of Rocket's regulatory interactions and planned submissions, Rocket's plans for the advancement of its Danon Disease program, including its planned pivotal trial, and the safety, effectiveness and timing of related pre-clinical studies and clinical trials, may constitute forward-looking statements for the purposes of the safe harbor provisions under the Private Securities Litigation Reform Act of 1995 and other federal securities laws and are subject to substantial risks, uncertainties and assumptions. You should not place reliance on these forward-looking statements, which often include words such as "aim," "anticipate," "believe," "can," "continue," "design," "estimate," "expect," "intend," "may," "plan," "potential," "will give," "seek," "will," "may," "suggest" or similar terms, variations of such terms or the negative of those terms. Although Rocket believes that the expectations reflected in the forward-looking statements are reasonable, Rocket cannot guarantee such outcomes. Actual results may differ materially from those indicated by these forward-looking statements as a result of various important factors, including, without limitation, Rocket's ability to monitor the impact of COVID-19 on its business operations and take steps to ensure the safety of patients, families and employees, the interest from patients and families for participation in each of Rocket's ongoing trials, patient enrollment, trial timelines and data readouts, our expectations regarding our drug supply for our ongoing and anticipated trials, actions of regulatory agencies, which may affect the initiation, timing and progress of pre-clinical studies and clinical trials of its product candidates, our ability to submit regulatory filings with the U.S. Food and Drug Administration (FDA) and to obtain and maintain FDA or other regulatory authority approval of our product candidates, Rocket's dependence on third parties for development, manufacture, marketing, sales and distribution of product candidates, the outcome of litigation, our competitors' activities, including decisions as to the timing of competing product launches, pricing and discounting, our integration of an acquired business, which involves a number of risks, including the possibility that the integration process could result in the loss of key employees, the disruption of our ongoing business, or inconsistencies in standards, controls, procedures, or policies, our ability to successfully develop and commercialize any technology that we may in-license or products we may acquire and any unexpected expenditures, as well as those risks more fully discussed in the section entitled "Risk Factors" in Rocket's Annual Report on Form 10-K for the year ended December 31, 2022, filed February 28, 2023 with the SEC and subsequent filings with the SEC including our Quarterly Reports on Form 10-Q. Accordingly, you should not place undue reliance on these forward-looking statements. All such statements speak only as of the date made, and Rocket undertakes no obligation to update or revise publicly any forward-looking statements, whether as a result of new information, future events or otherwise.

View source version on businesswire.com: https://www.businesswire.com/news/home/20230519005090/en/

Media
Kevin Giordano
kgiordano@rocketpharma.com

Investors
Brooks Rahmer
investors@rocketpharma.com

Source: Rocket Pharmaceuticals, Inc.