Rubius Therapeutics Presents Preclinical Data for Lead Red Cell Therapeutic™ Clinical Oncology Program, RTX-240, at the Society for Immunotherapy of Cancer's Annual Meeting

November 9, 2020

RTX-240 Demonstrates Promotion of T Cell and Natural Killer Cell Activation and Expansion In Vitro and In Vivo

CAMBRIDGE, Mass., Nov. 09, 2020 (GLOBE NEWSWIRE) -- Rubius Therapeutics, Inc. (Nasdaq:RUBY), a clinical-stage biopharmaceutical company that is genetically engineering red blood cells to create an entirely new class of cellular medicines called Red Cell Therapeutics™, today announced the presentation of new preclinical data supporting its lead clinical oncology program, RTX-240, at the Society for Immunotherapy of Cancer's (SITC) Annual Meeting. The meeting is being held virtually from November 9-14, 2020.

RTX-240 is an allogeneic, off-the-shelf Red Cell Therapeutic that is engineered to mimic the human immune system by stimulating adaptive and innate immunity to generate an anti-tumor immune response. Rubius Therapeutics is currently enrolling patients in the Phase 1/2 clinical trial of RTX-240 for the treatment of patients with relapsed/refractory or locally advanced solid tumors. In addition, RTX-240 is being evaluated in a second Phase 1 arm of the clinical trial for the treatment of patients with relapsed/refractory acute myeloid leukemia.

"The preclinical data presented at SITC indicate that RTX-240 has the ability to potently activate and expand CD8 T cells and natural killer (NK) cells in vitro and in vivo," said Laurence Turka, M.D., chief scientific officer of Rubius Therapeutics. "In addition, the preclinical data demonstrated that RTX-240 promotes NK cell killing of a myeloid leukemia cell line, giving us confidence that these promising preclinical results may translate into clinical benefit for patients with relapsed/refractory acute myeloid leukemia, where the activation status of the NK cells is linked to clinical outcomes. Finally, our surrogate model of RTX-240 demonstrated significant expansion of CD8 T cells and NK cells in a colorectal cancer model and potent anti-tumor activity in a melanoma model – giving us added conviction that RTX-240 may be an effective treatment for relapsed/refractory or locally advanced solid tumors."

Data Summary

RTX-240, an Allogeneic Engineered Red Blood Cell Expressing 4-1BBL and IL-15TP, Promotes NK Cell Functionality In Vitro and In Vivo

- RTX-240 is an allogeneic, off-the-shelf cellular therapy product candidate that is engineered to simultaneously present hundreds of thousands of copies of the costimulatory molecule 4-1BBL and IL-15TP (trans-presentation of IL-15 on IL-15Rα) on the cell surface in their native forms. RTX-240 is designed to stimulate innate and adaptive immunity by activating NK cells and T cells inside the patient's body to generate an anti-tumor immune response. RTX-240 preclinical data demonstrated:
  - RTX-240 led to increased CD8 T cell and NK cell expansion and activation in vitro compared to the combination of a 4-1BB agonist antibody plus recombinant IL-15 which was directly correlated with the percentage of 4-1BBL and IL-15TP expressed on the cell surface
  - RTX-240 expanded $CD56^{dim}$ NK cells, a cell population with high cytotoxicity
  - RTX-240 promoted NK cell-killing of a myeloid leukemia cell line, K562, and this was accompanied by increased NK cell degranulation and activation
  - A murine surrogate for RTX-240, mRBC-240, promoted significant expansion of CD8 T cells and NK cells in vivo in a murine model of colorectal cancer (CT26)
  - mRBC-240 demonstrated potent antitumor activity in a B16F10 melanoma model that was directly correlated with the expansion of terminally differentiated NK cells in the tumors

About the RTX-240 Clinical Trial

Rubius Therapeutics is enrolling patients in a Phase 1/2 open label, multicenter, multidose, first-in-human dose-escalation and expansion study of RTX-240. The study contains two Phase 1 dose escalation arms: one in patients with relapsed/refractory or locally advanced solid tumors and another in patients with relapsed/refractory acute myeloid leukemia. These two Phase 1 arms will determine the safety and tolerability, pharmacokinetics, maximum tolerated dose and a recommended Phase 2 dose and dosing regimen of RTX-240 in patients with solid tumors as well as in patients with relapsed/refractory AML. The trial will also assess the pharmacodynamics of RTX-240 measured by changes in T and NK cell number and function relative to baseline and anti-tumor activity in both patient populations. The study will include an expansion phase in specified tumor types during the Phase 2 portion of the solid tumor arm. The extent to which the COVID-19 pandemic may impact Rubius' ability to enroll patients in the trial will depend on future developments.

About RTX-240

RTX-240 is an allogeneic cellular therapy product candidate that is being evaluated for the treatment of patients with relapsed/refractory or locally advanced solid tumors or relapsed/refractory acute myeloid leukemia. RTX-240 is engineered to simultaneously present hundreds of thousands of copies of the costimulatory molecule 4-1BBL and IL-15TP (trans-presentation of IL-15 on IL-15Rα) in their native forms and is designed to stimulate

innate and adaptive immunity by activating NK cells and T cells inside the patient's body to generate an anti-tumor immune response.

About Rubius Therapeutics
Rubius Therapeutics is a clinical-stage biopharmaceutical company developing a new class of medicines called Red Cell Therapeutics™. The Company's proprietary RED PLATFORM ® was designed to genetically engineer and culture Red Cell Therapeutics™ that are selective, potent and off-the-shelf allogeneic cellular therapies for the potential treatment of several diseases across multiple therapeutic areas. Rubius' initial focus is to advance RCT™ product candidates for the treatment of cancer and autoimmune diseases by leveraging two distinct therapeutic modalities — potent cell-cell interaction and tolerance induction. Rubius Therapeutics' manufacturing site was recently named 2020 Top 5 Best Places to Work in Rhode Island among medium-sized companies by Providence Business News. For more information, visit www.rubiustx.com, follow us on Twitter or LinkedIn or like us on Facebook.

Forward Looking Statements
This press release contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended, including, without limitation, statements regarding our expectations with respect to the therapeutic potential of our pipeline of Red Cell Therapeutics, including RTX-240, our expectations regarding the timing, enrollment, data from and success of the future cohorts and phases of the clinical trial of RTX-240, including the Phase 1/2 clinical trial of RTX-240, our expectations regarding the biological effects of RTX-240 on innate and adaptive immunity and the related therapeutic benefits, and our expectations regarding our strategy, business plans and focus. The words "may," "will," "could," "would," "should," "expect," "plan," "anticipate," "intend," "believe," "estimate," "predict," "project," "potential," "continue," "target" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Any forward-looking statements in this press release are based on management's current expectations and beliefs and are subject to a number of risks, uncertainties and important factors that may cause actual events or results to differ materially from those expressed or implied by any forward-looking statements contained in this press release, including, without limitation, those risks and uncertainties related to the development of our Red Cell Therapeutic product candidates and their therapeutic potential and other risks identified in our SEC filings, including our Quarterly Report on Form 10-Q for the quarter ended June 30, 2020, and subsequent filings with the SEC and risks and uncertainties related to the severity and duration of the impact of COVID-19 on our business and operations. We caution you not to place undue reliance on any forward-looking statements, which speak only as of the date they are made. We disclaim any obligation to publicly update or revise any such statements to reflect any change in expectations or in events, conditions or circumstances on which any such statements may be based, or that may affect the likelihood that actual results will differ from those set forth in the forward-looking statements. Any forward-looking statements contained in this press release represent our views only as of the date hereof and should not be relied upon as representing its views as of any subsequent date. We explicitly disclaim any obligation to update any forward-looking statements.

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