Rubius Therapeutics Reports Fourth Quarter and Full Year 2021 Financial Results and Provides Business Update

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First Patient Dosed in Phase 1/2 Clinical Trial of RTX-224 in Patients with Certain Advanced Solid Tumors in January 2022

Single-Agent Phase 1 RTX-240 Clinical Trial in Advanced Solid Tumors Continues with No Dose-Limiting Toxicities Observed to Date and an NK Cell Dose Response.
Clinical Results Expected in Q1'22

Enrollment Continues in the Phase 1 Clinical Trials of RTX-321 in Patients with Advanced HPV 16-Positive Cancers and RTX-240 Combination Arm with Pembrolizumab in Patients with Advanced Solid Tumors; No Dose-Limiting Toxicities Observed to Date

Presented Comprehensive Preclinical Data from Type 1 Diabetes Program Demonstrating Tolerance Induction and Bystander Suppression at R&D Day in December 2021

Multiple Clinical Trial Data Milestones Expected Throughout 2022

CAMBRIDGE, Mass., Feb. 25, 2022 (GLOBE NEWSWIRE) -- Rubius Therapeutics, Inc. (Nasdaq: RUBY), a clinical-stage biopharmaceutical company that is biologically engineering red blood cells to create an entirely new class of cellular medicines called Red Cell Therapeutics™ for the treatment of cancer and autoimmune diseases, today reported fourth quarter and full year 2021 financial results.

"Twenty twenty-one was a year of strong execution for Rubius Therapeutics as we advanced our clinical oncology pipeline, strengthened our in-house manufacturing capabilities and showed preclinical proof of concept of our tolerance induction approach in type 1 diabetes, which has the potential to be extended to other T cell-mediated autoimmune diseases," said Pablo J. Cagnoni, M.D., president and chief executive officer of Rubius Therapeutics. "Twenty twenty-two is set to be a catalyst rich year with several clinical data milestones, including, during the first quarter, updated results from our single-agent RTX-240 Phase 1 clinical trial in advanced solid tumors and, during the second half of 2022, initial clinical data from our RTX-240 Phase 1 arm in combination with pembrolizumab in advanced solid tumors and from our RTX-321 clinical trial in advanced HPV 16-positive cancers."

Anticipated 2022 Catalysts and Operational Objectives

- Present additional clinical results from the Phase 1 arm of the RTX-240 Phase 1/2 clinical trial in advanced solid tumors and the Phase 1 arm in relapsed/refractory acute myeloid leukemia (AML) during the first quarter of 2022
- Initiate RTX-240 Phase 2 expansion cohorts in select solid tumor types during the first quarter of 2022
- Report initial clinical results from the Phase 1 clinical trial of RTX-321 in patients with advanced HPV 16-positive cancers during the second half of 2022
- Present initial clinical data from the Phase 1 arm of the RTX-240 clinical trial in combination with pembrolizumab in patients with advanced solid tumors during the second half of 2022

Fourth Quarter and Full Year 2021 Highlights

Broad Immune Stimulation

RTX-240

- Established clinical proof of concept of RTX-240 in advanced solid tumors, based on initial results reported in March 2021, potentially increasing the likelihood of clinical success across the oncology pipeline
- Patients continue to be dosed in the single-agent RTX-240 Phase 1 solid tumor clinical trial, with no dose-limiting toxicities observed to date and a clear dose response in the increase of NK cells and other pharmacodynamic effects
    - Additional clinical results are expected from this trial and the Phase 1 arm in relapsed/refractory AML during the first quarter of 2022
    - The Company plans to initiate RTX-240 Phase 2 expansion cohorts in select solid tumor types during the first quarter of 2022
- Continuing dose escalation in the RTX-240 Phase 1 combination study with pembrolizumab in patients with advanced solid tumors with initial clinical data expected during the second half of 2022

RTX-224

- In January 2022, the first patient was dosed in the Phase 1/2 clinical trial of RTX-224 in selected relapsed/refractory or locally advanced solid tumors that include non-small cell lung cancer, cutaneous melanoma, head and neck squamous cell carcinoma, urothelial (bladder) carcinoma and triple-negative breast cancer
- Presented preclinical data at the Society for Immunotherapy of Cancer's (SITC) 36th Annual Meeting in November 2021, demonstrating that the mouse surrogate of RTX-224, mRBC-224, generated potent anti-tumor activity in B16F10 melanoma models, intravenously and subcutaneously, that was associated with pharmacodynamic changes in blood and tumors, including activated CD4+ and CD8+ T cells, NK cells and macrophages

Antigen-Specific Immune Stimulation

RTX-321 Artificial Antigen-Presenting Cell (aAPC) Development Program for Human Papillomavirus (HPV) 16-Positive Cancers

- Continuing enrollment in the Phase 1 clinical trial of RTX-321 in patients with advanced HPV 16-positive cancers with no dose limiting toxicities observed to date
- Planning to report initial clinical results during the second half of 2022

Autoimmune Diseases and Type 1 Diabetes

- Demonstrated tolerance induction with bystander suppression in stringent type 1 diabetes preclinical models
  - Established efficacy in the BDC2.5 adoptive transfer model with data supporting that repeated dosing extended duration of disease protection, reversed established inflammation, which is important for the treatment of existing autoimmunity, and induced two types of regulatory T cells, resulting in protection against re-challenge
  - Showed efficacy in non-obese diabetes (NOD) preclinical model
    - Results at 25 weeks exhibit bystander suppression by delivering only two antigens, indicating the mouse surrogate of RTX-T1D prevented or delayed disease caused by many autoantigens
- These findings are potentially translatable beyond type 1 diabetes to multiple autoimmune diseases, including other Rubius' high priority target indications, multiple sclerosis and celiac disease

Manufacturing

- Increased cells produced per batch by four times in 50L bioreactors from 2020 to 2021, enabling uninterrupted clinical supply for three Phase 1 arms of the RTX-240 clinical trial and Phase 1 RTX-321 trial
- Introduced frozen drug substance for RTX-321 and RTX-224, potentially enabling inventory storage of greater than two years
- In process of scaling to 200L bioreactors by mid-2022 to support potential pivotal trials and eventual commercialization

Fourth Quarter 2021 Financial Results

Net loss for the fourth quarter of 2021 was $55.0 million or $0.61 per common share, compared to $40.5 million or $0.50 per common share in the fourth quarter of 2020.

In the fourth quarter of 2021, Rubius invested $39.8 million in research and development (R&D) related to its novel RED PLATFORM® and towards expanding and advancing its product pipeline, as compared to $25.6 million in the fourth quarter of 2020. This year-over-year increase was principally due to a $11.0 million increase in costs incurred for the Company's lead cancer programs, RTX-240 and RTX-321, primarily from clinical research organization (CRO) and internal manufacturing costs incurred in connection with the three arms of its Phase 1/2 clinical trial of RTX-240, for its Phase 1 clinical trial of RTX-321 for the treatment of HPV16-positive cancers and for start-up costs related to its Phase 1 clinical trial of RTX-224. Additionally, personnel-related costs increased $1.4 million principally for additions to headcount to support the Company's expanded operations and stock-based compensation increased by $1.5 million.

General and administrative (G&A) expenses were $13.9 million during the fourth quarter of 2021, as compared to $14.1 million for the fourth quarter of 2020. While there were increases totaling $1.0 million across professional fees, facility and personnel costs, they were offset by a decline in stock-based compensation expense of $1.2 million following the full vesting of large awards early in the third quarter of 2021.

Full Year 2021 Financial Results

Net loss for the full year 2021 was $196.5 million or $2.23 per common share, compared to $167.7 million or $2.08 per common share for the full year 2020.

For the full year 2021, Rubius invested $141.6 million in R&D related to its novel RED PLATFORM® and towards expanding and advancing its product pipeline, as compared to $116.1 million for the full year 2020. The year-over-year increase was driven by $28.7 million of incremental costs to advance the Company's lead cancer programs, including CRO and internal manufacturing costs. These costs were associated with the three arms of its Phase 1/2 clinical trial of RTX-240, for its Phase 1 clinical trial of RTX-321 in patients with advanced HPV 16-positive cancers, and for start-up costs related to its Phase 1 clinical trial of RTX-224. The increase in cancer program costs was partially offset by a $5.0 million reduction in rare disease program costs

following the deprioritization of the Company's rare disease pipeline in March 2020. Additionally, platform development, early-stage research and other unallocated expenses increased by $1.8 million. This consisted of $4.3 million in additional stock-based compensation and a $3.1 million increase in personnel and facility related costs, which were partially offset by reductions in contract R&D, laboratory supplies and research materials as research activities shifted to support clinical programs.

G&A expenses were $53.0 million during full year of 2021, as compared to $50.3 million for the same period in 2020. The higher costs were driven by a $3.4 million increase in personnel and facility related costs, as well as a $1.6 million increase in professional and consultant fees. These increases were offset by a decrease in stock-based compensation expense following the vesting of large awards early in the second half of 2021.

Cash Position

As of December 31, 2021, cash and cash equivalents were $225.8 million as compared to $176.3 million in cash, cash equivalents and investments as of December 31, 2020, providing Rubius with a cash runway into the second quarter of 2023 and the ability to extend the runway into the middle of 2023. In connection with its underwritten public offering completed in March 2021, the Company received net proceeds of $187.2 million, after deducting underwriting discounts and commission and other offering costs. In addition, in June 2021, the Company amended its debt facility, postponing principal payments by two and a half years, until mid-2024.

Rubius Therapeutics, Inc.
Condensed Consolidated Statement of Operations
(in thousands, except share and per share data)
(unaudited)

	For the three months ended December 31,		For the year ended December 31,	
	2021	2020	2021	2020
Revenue	$ -	$ -	$ -	$ -
Operating expenses:				
Research and development	39,824	25,616	141,587	116,107
General and administrative	13,903	14,100	53,029	50,341
Total operating expenses	53,727	39,716	194,616	166,448
Loss from operations	(53,727)	(39.716)	(194,616)	(166,448)
Other income (expense), net	(1,294)	(823)	(1,931)	(1,283)
Net loss	$ (55,021)	$ (40,539)	$ (196,547)	$ (167,731)
Net loss per share, basic and diluted	$ (0.61)	$ (0.50)	$ (2.23)	$ (2.08)
Weighted average common shares outstanding, basic and diluted:	89,918,679	80,961,343	87,950,440	80,624,608

Rubius Therapeutics, Inc.
Condensed Consolidated Balance Sheet Data
(in thousands)
(unaudited)

	December 31, 2021	December 31, 2020
Cash, cash equivalents and investments	$ 225,848	$ 176,287
Total assets	318,021	277,794
Total liabilities	139,239	136,234
Total stockholders' equity	178,782	141,560

About RTX-240
RTX-240, Rubius Therapeutics' lead oncology program, 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 4-1BB ligand (4-1BBL) and IL-15TP (trans-presentation of IL-15 on IL-15Rα) in their native forms. RTX-240 is designed to broadly stimulate the immune system by activating and expanding both NK and memory T cells to generate a potent anti-tumor response.

About RTX-321
RTX-321, the Company's second oncology program, is an allogeneic, off-the-shelf aAPC therapy product candidate that is engineered to induce a tumor-specific immune response by expanding antigen-specific T cells. RTX-321 expresses hundreds of thousands of copies of an HPV peptide antigen bound to major histocompatibility complex class I proteins, the costimulatory molecule 4-1BBL and the cytokine IL-12 on the cell surface to mimic human T cell-APC interactions.

About RTX-224
RTX-224 is an allogeneic, off-the-shelf cellular therapy product candidate that is engineered to express hundreds of thousands of copies of 4-1BBL and IL-12 on the cell surface. In contrast to RTX-240, RTX-224 is designed as a broad immune agonist of both adaptive and innate responses, activating CD8+ and CD4+ T cells, promoting antigen presentation and activating and expanding NK cells. It is expected to produce a broad and potent anti-tumor T cell response, an innate immune response and have anti-tumor activity in those tumor types with known sensitivity to T cell killing, including tumor types with high mutational burden, PD-L1 expression and prior activity of checkpoint inhibitors.

About Red Cell Therapeutics in Autoimmune Diseases

Red Cell Therapeutics for the treatment of autoimmune disease are biologically engineered to express proteins and peptides inside the cell and are designed to be phagocytized, or ingested, by dendritic cells or macrophages to induce tolerance, retraining the immune system to no longer recognize these self-antigens as foreign.

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 biologically 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 was recently named among the 2021 Top Places to Work in Massachusetts by the Boston Globe, and its manufacturing site was recently named 2021 Best Places to Work in Rhode Island 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 beliefs about Rubius' execution across preclinical and clinical development, Rubius' plans and expected timing to present clinical results for RTX-240 and RTX-321, beliefs that findings from preclinical models will be translatable to multiple T cell-mediated autoimmune diseases, plans to advance and expectations for aAPCs, plans and timing to scale manufacturing, expectations regarding the therapeutic potential and safety profile of our pipeline of Red Cell Therapeutics, our interpretations of data, including as to the efficacy of our product candidates with respect to autoimmune diseases, including multiple sclerosis and celiac disease, and Type 1 diabetes, as well as beliefs about our manufacturing accomplishments and storage capabilities, and goals and expectations for further manufacturing activities. 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, our ability to execute on our plans and expectations, our analyses of clinical and preclinical data and other risks identified in our filings with the U.S. Securities and Exchange Commission (SEC), including our Quarterly Report on Form 10-Q for the quarter ended September 30, 2021 and subsequent filings with the SEC, including our Annual Report on Form 10-K for the year ended December 31, 2021, which will be filed on or about the date hereof, 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.

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