UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d)
of the Securities Exchange Act of 1934

March 25, 2019
Date of Report (Date of earliest event reported)

ATYR PHARMA, INC.
(Exact name of registrant as specified in its charter)

Delaware	**001-37378**	**20-3435077**
(State or other jurisdiction of incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**

3545 John Hopkins Court, Suite #250
San Diego, California 92121

(Address of principal executive offices, including zip code)

(858) 731-8389

(Registrant's telephone number, including area code)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligations of the registrant under any of the following provisions:

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 or Rule 12b-2 of the Securities Exchange Act of 1934.

Emerging growth company ☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☒

Item 2.02 Results of Operations and Financial Condition.

On March 25, 2019, aTyr Pharma, Inc. announced financial results for the year ended December 31, 2018 in the earnings release attached hereto as Exhibit 99.1.

The information under this Item 2.02, including Exhibit 99.1 hereto is being furnished and shall not be deemed "filed" for the purposes of Section 18 of the Securities and Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liabilities of that section, nor shall such information be deemed incorporated by reference into any filing under the Securities Act of 1933, as amended or the Exchange Act, except as expressly set forth by specific reference in such filing.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits.

99.1 Press Release of aTyr Pharma, Inc. dated March 25, 2019.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

ATYR PHARMA, INC.

By: /s/ Sanjay S. Shukla
Sanjay S. Shukla, M.D., M.S.
President and Chief Executive Officer

Date: March 25, 2019

IMMEDIATE RELEASE

Contact:
Joyce Allaire
Managing Director, LifeSci Advisors, LLC
jallaire@lifesciadvisors.com

aTyr Pharma Announces Fourth Quarter and Full Year 2018 Results and Provides Corporate Update

Phase 1b/2a proof-of-concept clinical trial of ATYR1923 in pulmonary sarcoidosis patients initiated in December 2018

First tRNA synthetase partnership announced in March 2019

SAN DIEGO – March 25, 2019 – aTyr Pharma, Inc. (Nasdaq: LIFE), a biotherapeutics company engaged in the discovery and development of innovative medicines based on novel immunological pathways, today announced fourth quarter and full year 2018 results and provided a corporate update.

"We continue to execute our clinical development plan for our lead therapeutic candidate, ATYR1923, while also entering into meaningful collaborations with both academic institutions and global drug development partners that leverage our novel tRNA synthetase biology," said Dr. Sanjay Shukla, President and Chief Executive Officer of aTyr. "We initiated our Phase 1b/2a proof-of-concept clinical trial of ATYR1923 in pulmonary sarcoidosis patients in December 2018 as planned, and look forward to interim results in the fourth quarter of 2019. Data from this study represents a significant potential inflection point for our Company, and will guide future development in pulmonary sarcoidosis. We are pleased with the initial conduct of this study and look forward to sharing interim results later this year."

Fourth Quarter and Subsequent Period Clinical Highlights and Upcoming Milestones

- Initiated its Phase 1b/2a study of ATYR1923 in patients with pulmonary sarcoidosis in collaboration with the Foundation for Sarcoidosis Research (FSR)
  - Interim results expected during the fourth quarter of this year
- Announced an expansion of its successful pilot study and entered into a research collaboration with the University of Nebraska Medical Center (UNMC) to advance neuropilin-2 (NRP-2) biology and explore potential therapeutic opportunities for ATYR1923. Data from the pilot study has provided further evidence that ATYR1923 modulates immune cell biology and a poster will be presented at the *2019 AACR Annual Meeting* on April 3, 2019.

Research Highlights

- Entered into a research collaboration and option agreement with CSL Behring (CSL) for the development of product candidates derived from up to four tRNA synthetases from aTyr's preclinical pipeline. Under the terms of the collaboration, CSL will fund all research and development activities, and aTyr is eligible to receive up to $17 million in option fees ($4.25 million per synthetase program). aTyr will grant CSL the option to negotiate licenses for worldwide rights to each IND candidate that emerges from this collaboration.

- Presented preclinical data at *Keystone Symposia 2019: Myeloid Cells* demonstrating, for the first time, ATYR1923's ability to bind to NRP-2 and down-regulate myeloid cells, specifically neutrophils, during lung inflammation. These findings help support aTyr's belief in the mechanism of action of ATYR1923 to suppress immune engagement in pulmonary sarcoidosis as well as other interstitial lung diseases.

Fourth Quarter 2018 Financial Results and Cash Position

Research and development expenses were $3.5 million and $5.3 million for the three months ended December 31, 2018 and 2017, respectively. The decrease of $1.8 million was primarily due to a $0.7 million decrease in personnel associated costs due to lower headcount, which was mainly a result of the restructuring plan announced in May 2018 (the "Restructuring Plan"), a $0.3 million decrease in product manufacturing costs, a $0.3 million decrease in ATYR1923 preclinical activities, and a $0.5 million decrease in overall general research and development expenses.

General and administrative expenses were $2.4 million and $5.9 million for the three months ended December 31, 2018 and 2017, respectively. The decrease of $3.5 million was primarily due to a $2.5 million decrease in non-cash stock compensation expense, a $0.9 million decrease in personnel associated costs due to lower headcount, which was mainly a result of the Restructuring Plan, and a $0.1 million decrease related to overall general and administrative expenses.

Year Ended December 31, 2018 Financial Results

Research and development expenses were $20.4 million and $30.1 million for the years ended December 31, 2018 and 2017, respectively. The decrease of $9.7 million was due primarily to a $4.2 million decrease related to the completion of preclinical and clinical studies related to ATYR1923 and ATYR1940, a $3.3 million decrease in product manufacturing costs, a $1.7 million decrease in personnel associated costs due to lower headcount, which was mainly a result of the Restructuring Plan, a $1.4 million decrease in overall general research and development expenses and a $0.2 million decrease in non-cash stock-based compensation expense. The decrease was partially offset by an increase of $1.1 million related to the initiation of our ATYR1923 Phase 1b/2a clinical trial.

General and administrative expenses were $12.4 million and $17.1 million for the years ended December 31, 2018 and 2017, respectively. The decrease of $4.6 million was due primarily to a $3.2 million decrease in non-cash stock-based compensation expense due to executive transitions in 2017, a $0.6 million decrease in personnel associated costs due to lower headcount, which was mainly a result of the Restructuring Plan and a $0.8 million decrease in intellectual property and legal expenses.

As of December 31, 2018, aTyr had $49.5 million in cash, cash equivalents and investments and 42.0 million shares of common stock outstanding on an if-converted basis (includes 30.6 million shares of common stock and 11.4 million shares of common stock if converted from Class X Preferred stock). For 2019, aTyr is projecting a cash burn of approximately $23 million to $25 million, net of debt.

Conference Call and Webcast Details

aTyr Pharma will host a conference call and webcast today at 5:00 p.m. Eastern Time / 2:00 p.m. Pacific Time to discuss its financial results and provide a corporate update. Interested parties may access the call by dialing toll-free (844) 358-9116 from the US, or (209) 905-5951 internationally and using conference ID 1849119. Links to a live audio webcast and

replay may be accessed on the aTyr website events page at: http://investors.atyrpharma.com/events-and-webcasts. An audio replay will be available for at least 90 days following the event.

About ATYR1923

aTyr is developing ATYR1923 as a potential therapeutic for patients with interstitial lung diseases. ATYR1923, a fusion protein comprised of the immuno-modulatory domain of histidyl tRNA synthetase (HARS) fused to the FC region of a human antibody, is a selective modulator of Neuropilin-2 that downregulates the innate and adaptive immune response in inflammatory disease states. aTyr initiated a proof-of-concept Phase 1b/2a trial evaluating ATYR1923 in patients with pulmonary sarcoidosis in the fourth quarter of 2018. This Phase 1b/2a study is a multi-ascending dose, placebo-controlled, first-in-patient study of ATYR1923 that has been designed to evaluate the safety, tolerability, steroid sparing effect, immunogenicity and pharmacokinetics (PK) profile of multiple doses of ATYR1923. For the Phase 1b/2a trial, aTyr is collaborating with the Foundation for Sarcoidosis Research (FSR), the nation's leading nonprofit organization dedicated to finding a cure for sarcoidosis and improving care for sarcoidosis patients. Under the terms of the collaboration, FSR will assist with clinical trial site initiation and patient enrollment.

About aTyr

aTyr is a biotherapeutics company engaged in the discovery and development of innovative medicines based on novel immunological pathways. aTyr's research and development efforts are concentrated on a newly discovered area of biology, the extracellular functionality of tRNA synthetases. aTyr has built a global intellectual property estate directed to a potential pipeline of protein compositions derived from 20 tRNA synthetase genes. aTyr is focused on the therapeutic translation of the Resokine pathway, comprised of extracellular proteins derived from the histidyl tRNA synthetase gene family. ATYR1923 is a clinical-stage product candidate which binds to the neuropilin-2 receptor and is designed to down-regulate immune engagement in interstitial lung diseases and other immune-mediated diseases. For more information, please visit http://www.atyrpharma.com.

Forward-Looking Statements

This press release contains forward-looking statements within the meaning of the Private Litigation Reform Act. Forward-looking statements are usually identified by the use of words such as "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "projects," "seeks," "should," "will," and variations of such words or similar expressions. We intend these forward-looking statements to be covered by such safe harbor provisions for forward-looking statements and are making this statement for purposes of complying with those safe harbor provisions. These forward-looking statements, including statements regarding our projected cash expenditures, the potential therapeutic benefits and applications of our product candidates; our ability to successfully advance our product candidates, undertake certain development activities (such as the initiation of clinical trials, clinical trial enrollment, the conduct of clinical trials and the announcement of top-line results) and accomplish certain development goals, and the timing of such events; and the scope and strength of our intellectual property portfolio. These forward-looking statements also reflect our current views about our plans, intentions, expectations, strategies and prospects, which are based on the information currently available to us and on assumptions we have made. Although we believe that our plans, intentions, expectations, strategies and prospects, as reflected in or suggested by these forward-looking statements, are reasonable, we can give no assurance that the plans, intentions, expectations or strategies will be attained or achieved. All forward-looking statements are based on estimates and

assumptions by our management that, although we believe to be reasonable, are inherently uncertain. Furthermore, actual results may differ materially from those described in these forward-looking statements and will be affected by a variety of risks and factors that are beyond our control including, without limitation, risks associated with the discovery, development and regulation of our product candidates, the risk that we may cease or delay preclinical or clinical development activities for any of our existing or future product candidates for a variety of reasons (including difficulties or delays in patient enrollment in planned clinical trials), and the risk that we may not be able to raise the additional funding required for our business and product development plans, as well as those risks set forth in our most recent Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and in our other SEC filings. Except as required by law, we assume no obligation to update publicly any forward-looking statements, whether as a result of new information, future events or otherwise.

ATYR PHARMA INC.
Condensed Consolidated Statements of Operations
(in thousands, except share and per share data)

	Three Months Ended December 31,		Years Ended December 31,	
	2018	2017	2018	2017
Operating expenses:				
Research and development	$ 3,549	$ 5,310	$ 20,385	$ 30,067
General and administrative	2,414	5,890	12,435	17,078
Total operating expenses	5,963	11,200	32,820	47,145
Loss from operations	(5,963)	(11,200)	(32,820)	(47,145)
Total other expense, net	(359)	(274)	(1,695)	(1,062)
Net loss	$ (6,322)	$ (11,474)	$ (34,515)	$ (48,207)
Net loss per share attributable to common stock holders, basic and diluted	$ (0.21)	$ (0.39)	$ (1.15)	$ (1.87)
Weighted average common stock shares outstanding, basic and diluted	30,327,072	29,768,259	29,957,102	25,799,853

ATYR PHARMA INC.
Condensed Consolidated Balance Sheets
(in thousands)

	December 31,	
	2018	2017
Cash, cash equivalents and available-for-sale investments	$ 49,545	$ 85,119
Other assets	1,348	1,956
Property and equipment, net	1,853	2,280
Total assets	$ 52,746	$ 89,355
Accounts payable and accrued expenses	$ 3,066	$ 5,379
Current portion of long-term loans, net of debt issuance costs and discount	7,767	5,012
Term loans, net of current portion and debt issuance costs and discount	8,263	14,719
Stockholders' equity	33,650	64,245
Total liabilities and stockholders' equity	$ 52,746	$ 89,355