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

Date of Report (Date of earliest event reported): November 6, 2026

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.)**

10240 Sorrento Valley Road, Suite 300 **San Diego, CA** **(Address of Principal Executive Offices)**	**92121** **(Zip Code)**

Registrant's telephone number, including area code: (858) 731-8389

Not Applicable
(Former Name or Former Address, if Changed Since Last Report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation 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))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.001 per share	ATYR	The Nasdaq Capital Market

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

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 8.01 Other Events.

On November 6, 2026, aTyr Pharma, Inc. (the "Company") filed a prospectus supplement (the "Prospectus Supplement") related to the sale of the Company's common stock, par value $0.001 per share (the "Common Stock") with the Securities and Exchange Commission (the "SEC") pursuant to which the Company may offer and sell Common Stock having an aggregate offering price of up to $79,994,251 from time to time under the Company's Open Market Sale Agreement℠, dated April 22, 2022, as amended December 23, 2024 (the "Sales Agreement"), by and between the Company and Jefferies LLC. The Prospectus Supplement was filed under the Company's shelf registration statement on Form S-3 (File No. 333-289360), which was initially filed with the SEC on August 7, 2025, and which was declared effective on August 18, 2025. A copy of the legal opinion as to the legality of the $79,994,251 of shares of Common Stock issuable under the Sales Agreement and covered by the Prospectus Supplement is filed as Exhibit 5.1 attached hereto.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
5.1	Opinion of Cooley LLP.
23.1	Consent of Cooley LLP (included in Exhibit 5.1).
104	Cover Page Interactive Data File (embedded within the Inline XBRL document).

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/ Brandon Yaras
Brandon Yaras
Chief Financial Officer

Date: November 6, 2026

Cooley

Exhibit 5.1

Charles J. Bair
T: +1 858 550 6142
cbair@cooley.com

November 6, 2026

aTyr Pharma, Inc.
10240 Sorrento Valley Road, Suite #300
San Diego, CA 92121

Ladies and Gentlemen:

We have acted as counsel to aTyr Pharma, Inc., a Delaware corporation (the "***Company***"), in connection with the offering by the Company of shares (the "***Shares***") of its common stock, par value $0.001 per share ("***Common Stock***"), having an aggregate offering price of up to $79,994,251 pursuant to the Registration Statement on Form S-3 (File No. 333-289360) (the *"**Registration Statement**"*) filed with the Securities and Exchange Commission (the *"**Commission**"*) under the Securities Act of 1933, as amended (the "***Securities Act***"), the prospectus included in the Registration Statement (the "***Base Prospectus***") and the prospectus supplement dated November 6, 2026 filed with the Commission pursuant to Rule 424(b) under the Securities Act (together, the "***Prospectus***"). The Shares are to be sold by the Company under the Open Market Sale Agreement℠, dated April 22, 2022, as amended December 23, 2024, between the Company and Jefferies LLC (the "***Agreement***").

In connection with this opinion, we have examined and relied upon (i) the Registration Statement and the Prospectus, (ii) the Agreement, (iii) the Company's certificate of incorporation and bylaws, each as currently in effect, and (iv) such other records, documents, certificates, opinions, memoranda and instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below. We have assumed the genuineness of all signatures; the authenticity of all documents submitted to us as originals; the conformity to originals of all documents submitted to us as copies; the accuracy, completeness and authenticity of certificates of public officials; and the due authorization, execution and delivery of all documents by all persons other than the Company. As to certain factual matters, we have relied upon a certificate of an officer of the Company and have not independently verified such matters.

We have assumed that (i) each sale of the Shares will be duly authorized by the Board of Directors of the Company, a duly authorized committee thereof or a person or body pursuant to an authorization granted in accordance with Section 152 of the General Corporation Law of the State of Delaware (the "***DGCL***"), (ii) no more than 15,000,000 Shares will be sold under the Agreement pursuant to the Prospectus and (iii) the price at which the Shares are sold will equal or exceed the par value per share of the Common Stock. We express no opinion to the extent that future issuances of securities of the Company, anti-dilution adjustments to outstanding securities of the Company or other matters cause the number of shares of Common Stock issuable under the Agreement to exceed the number of shares of Common Stock.

Our opinion is expressed solely with respect to the DGCL. We express no opinion to the extent that any other laws are applicable to the subject matter hereof and express no opinion and provide no assurance as to compliance with any federal or state securities law, rule or regulation.

Cooley

On the basis of the foregoing, in reliance thereon and subject to the assumptions, qualifications, limitations and exceptions set forth herein, we are of the opinion that the Shares, when sold and issued against payment therefor in accordance with the Agreement, the Registration Statement and the Prospectus, will be validly issued, fully paid and nonassessable.

* * * * *

This opinion is limited to the matters expressly set forth in this letter, and no opinion has been or should be implied, or may be inferred, beyond the matters expressly stated. This opinion speaks only as to law and facts in effect or existing as of the date hereof, and we have no obligation or responsibility to update or supplement this letter to reflect any facts or circumstances that may hereafter come to our attention or any changes in law that may hereafter occur.

We consent to the reference to our firm under the heading “Legal Matters” in the Prospectus and to the filing of this opinion as an exhibit to the Company’s Current Report on Form 8-K to be filed with the Commission for incorporation by reference into the Registration Statement. In giving such consents, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission thereunder.

Very truly yours,

Cooley LLP

By: /s/ Charles J. Bair
Charles J. Bair