UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

SCHEDULE 14A INFORMATION

Proxy Statement Pursuant to Section 14(a) of the Securities Exchange Act of 1934 (Amendment No.)

Filed by the Degistrent

| Filed by a Party other than the Registrant □ |
|--|
| Check the appropriate box: |
| □ Preliminary Proxy Statement □ Confidential, for Use of the Commission Only (as permitted by Rule 14a-6(e)(2)) □ Definitive Proxy Statement □ Definitive Additional Materials □ Soliciting Material Pursuant to §240.14a-12 |
| Ensysce Biosciences, Inc. (Name of Registrant as Specified In Its Charter) |
| (Name of Person(s) Filing Proxy Statement, if other than the Registrant) |
| Payment of Filing Fee (Check the appropriate box): |
| ☑ No fee required. |
| ☐ Fee paid previously with preliminary materials. |
| ☐ Fee computed on table in exhibit required by Item 25(b) per Exchange Act Rules 14a-6(i)(1) and 0-11. |
| |



NOTICE OF ANNUAL MEETING OF STOCKHOLDERS Scheduled For December 23, 2025 – To Be Adjourned to January 7, 2026

To Our Stockholders:

Notice is hereby given that an Annual Meeting of stockholders (the "Annual Meeting") of Ensysce Biosciences, Inc., a Delaware corporation (the "Company" or "Ensysce"), scheduled to be held virtually at https://www.cstproxy.com/ensysce/2025 on December 23, 2025, at 9:00 a.m. (Pacific time), will be adjourned and held virtually at https://www.cstproxy.com/ensysce/2025 on January 7, 2026 at 9:00 a.m. (Pacific time), because the Ensysce Board of Directors has been advised that a quorum will not be present on December 23, 2025. The Annual Meeting will be held for the purposes described in the proxy statement for the Annual Meeting previously mailed. A proxy card for the Annual Meeting, which lists the matters to be considered, is attached and made a part of this Notice.

Whether or not you plan to attend the Annual Meeting, you are encouraged to read the Proxy Statement and then cast your vote as promptly as possible in accordance with the instructions contained in the Proxy Statement. Even if you have given your proxy, you may still vote online if you follow the instructions contained in the Proxy Statement.

By Order of the Board of Directors of Ensysce Biosciences, Inc.

Sincerely,

/s/ Dr. Lynn Kirkpatrick

Dr. Lynn Kirkpatrick

President and Chief Executive Officer

La Jolla, California December 16, 2025

YOUR VOTE IS IMPORTANT. PLEASE VOTE TODAY.

ENSYSCE BIOSCIENCES, INC.

| Vote by Internet – QU | | | |
|---|--|--|--|
| IMMEDIATE - 24 Hours a Da | ay, 7 Days a Week or by Mail | | |
| ENSYSCE BIOSCIENCES, INC. | Your Mobile or Internet vote authorizes the named proxies to vote your shares in the same manner as if you marked, signed and returned your proxy card. Votes submitted electronically over the Internet must be received by 10:59 p.m., Eastern Time, on January 6, 2026. | | |
| | INTERNET www.cstproxyvote.com Use the Internet to vote your proxy. Have your proxy card available when you access the above website. Follow the prompts to vote your shares. | | |
| | Vote at the Meeting – If you plan to attend the virtual online Annual Meeting, you will need your 12 digit control number to vote electronically at the Annual Meeting. To attend the Annual Meeting, visit: https://www.cstproxy.com/ensysce/2025 | | |
| | MOBILE VOTING On your Smartphone/Tablet, open the QR Reader and scan the below image. Once the voting site is displayed, enter your Control Number from the proxy card and vote your shares. | | |
| PLEASE DO NOT RETURN THE PROXY CARD IF YOU ARE VOTING ELECTRONICALLY. | MAIL – Mark, sign and date your proxy card and return it in the postage-paid envelope provided. | | |
| ♣ FOLD HERE • DO NOT SEPARATE • I | INSERT IN ENVELOPE PROVIDED ▲ | | |
| THE BOARD OF DIRECTORS RECOMMENDS A VOTE | E "FOR" ALL PROPOSALS. Please mark your votes like this | | |
| Proposal 1 Approve, for purposes of complying with Nasdaq Listing Rule 5635(d), the full issuance and of shares of common stock and exercise of warrants for common stock issued by the Company to an investor ("Proposal 1"). | Proposal 4 To ratify the appointment Baker Tilly US, LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2025 (*Proposal 4*); and | | |
| Proposal 2 Approve the amendment of the Ensysce Biosciences, Inc. Amended and Restated 2021 Omnibus Incentive Plan to increase the aggregate number of shares of the Company's common stock that may be issued under the plan from 121,457 shares to 721,457 shares ("Proposal 2"). | Proposal 5 Consider and vote upon the adjournment of the Annual Meeting, if necessary or appropriate, to solicit additional proxies in favor of any or all of the other proposals set forth in this Proxy Statement (the "Additional Solicitation Proposal"); | | |
| Proposal 3 To elect the two Class I directors named in our Proxy Statement (collectively, the "Director Nominees") to hold office until the annual meeting of stockholders for the calendar year ended December 31, 2028 (the "2028 Annual Meeting") and until their respective successors have been duly elected and qualified ("Proposal 3"); | | | |

2025

| Listing Rule 5635(d), to of common stock ar | s of complying with Nasdaq he full issuance and of shares and exercise of warrants for by the Company to an investor ("Proposal 1"). |
|---|---|
| Inc. Amended and Res Plan to increase the ac the Company's comm | nt of the Ensysce Biosciences, tated 2021 Omnibus Incentive ggregate number of shares of under the plan from 457 shares ("Proposal 2"). |
| the "Director Nomine stockholders for the ca | directors named in our Proxy Statement (collectively, ses") to hold office until the annual meeting of alendar year ended December 31, 2028 (the "2028 until their respective successors have been duly Proposal 3"); |
| Nominees: | FOR WITHHOLD |
| (1) William Chang | |
| (2)Lee Rauch | |
| | |
| | |

| CONTROL NUMBER | |
|----------------|--|
| | |
| | |

Signature Signature Sould agree with name printed hereon. If stock is held in the name of more than one person, EACH joint owner should sign. Executors, administrators,

Important Notice Regarding the Internet Availability of Proxy Materials for the Annual Meeting of Stockholders of Ensysce Biosciences, Inc.

Scheduled for December 23, 2025 and to be Adjourned to January 7, 2026

To view the Proxy Statement and to Attend the Annual Meeting, please go to: https://www.cstproxy.com/ensysce/2025

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PROXY

THIS PROXY IS SOLICITED ON BEHALF OF THE BOARD OF DIRECTORS OF ENSYSCE BIOSCIENCES, INC.

FOR THE DECEMBER 23, 2025 ANNUAL MEETING OF STOCKHOLDERS TO BE ADJOURNED TO JANUARY 7, 2026

The undersigned, revoking any previous proxies relating to these shares, hereby acknowledges receipt of the Notice and Proxy Statement, dated December 1, 2025, in connection with the Annual Meeting to be adjourned from 9:00 a.m. Pacific Time on December 23, 2025, virtually at https://www.cstproxy.com/ensysce/2025, to 9:00 a.m. Pacific Time on January 7, 2026, virtually at https://www.cstproxy.com/ensysce/2025, and hereby appoints David Humphrey the attorney and proxy of the undersigned, with power of substitution to each, to vote all shares of common stock of Ensysce Biosciences, Inc. (the "Company") registered in the name provided, which the undersigned is entitled to vote at the Annual Meeting of stockholders, with all the powers the undersigned would have if personally present. Without limiting the general authorization hereby given, said proxy is instructed to vote or act as follows on the proposals set forth in the Proxy Statement previously mailed.

THIS PROXY, WHEN EXECUTED, WILL BE VOTED IN THE MANNER DIRECTED HEREIN. IF NO DIRECTION IS MADE, THIS PROXY WILL BE VOTED "FOR" PROPOSAL 1, "FOR" PROPOSAL 2, "FOR" EACH DIRECTOR NOMINEE IN PROPOSAL 3, "FOR" PROPOSAL 4 AND "FOR" THE ADDITIONAL SOLICITATION PROPOSAL.

PLEASE SIGN, DATE AND RETURN THE PROXY IN THE ENVELOPE ENCLOSED TO ISSUER DIRECT. THIS PROXY WILL BE VOTED IN THE MANNER DIRECTED HEREIN BY THE UNDERSIGNED STOCKHOLDER. IF NO DIRECTION IS MADE, THIS PROXY WILL BE VOTED "FOR" PROPOSAL 1, "FOR" PROPOSAL 2, "FOR" EACH DIRECTOR NOMINEE IN PROPOSAL 3, "FOR" PROPOSAL 4 AND "FOR" THE ADDITIONAL SOLICITATION PROPOSAL. THIS PROXY WILL REVOKE ALL PRIOR PROXIES SIGNED BY YOU.

(Continued and to be marked, dated and signed on the other side)