

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
Form 10-K/A
Amendment No. 1

(Mark One)
 ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2022

TRANSITION REPORTS PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from _____ to _____

Commission File Number: 001-37937

XENETIC BIOSCIENCES, INC.
(Exact name of registrant as specified in its charter)

Nevada
(State or other jurisdiction of incorporation or organization)

45-2952962
(IRS Employer Identification No.)

945 Concord Street
Framingham, Massachusetts 01701
(Address of principal executive offices) (Zip code)

781-778-7720
(Registrant's telephone number, including area code)

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, \$0.001 par value per share	XBIO	The Nasdaq Capital Market
Purchase Warrants	XBIOW	The Nasdaq Capital Market

Securities registered pursuant to Section 12(g) of the Act:
None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act: Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act: Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days): Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files): Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer" "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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.

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

Indicate by check mark whether the registrant is a shell company (as defined in Exchange Act Rule 12b-2): Yes No

The aggregate market value of the voting and non-voting common stock held by non-affiliates of the registrant as of June 30, 2022, the last business day of the registrant's most recently completed second fiscal quarter, based upon the closing price of the registrant's common stock on the Nasdaq Capital Market on that date of \$0.80, was approximately \$11,319,395. For purposes of this computation, all officers, directors, and 10% beneficial owners of the registrant are deemed to be affiliates. Such determination should not be deemed to be an admission that such officers, directors or 10% beneficial owners are, in fact, affiliates of the registrant.

As of April 21, 2023, the number of outstanding shares of the registrant's common stock was 15,166,596.

DOCUMENTS INCORPORATED BY REFERENCE
None.

EXPLANATORY NOTE

The Registrant is filing this Amendment No. 1 on Form 10-K/A (this "Amendment") to amend its Annual Report on Form 10-K for the fiscal year ended December 31, 2022, originally filed with the Securities and Exchange Commission ("SEC") on March 22, 2023 (the "Original Filing"), to include the information required by Items 10 through 14 of Part III of Form 10-K. This information was previously omitted from the Original Filing in reliance on General Instruction G(3) to Form 10-K, which permits the information in

the above-referenced items to be incorporated in the Form 10-K by reference from our definitive proxy statement if such statement is filed no later than 120 days after our fiscal year-end. We are filing this Amendment to include Part III information in our Form 10-K because our definitive proxy statement will be filed later this year.

Part III of the Original Filing (Items 10 through 14) is being amended and restated in its entirety by this Amendment. In addition, pursuant to Rule 12b-15 under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), Part IV, Item 15 of the Original Filing is being amended to contain the currently dated certifications pursuant to Section 302 of the Sarbanes-Oxley Act of 2002, which are attached hereto as Exhibit 31.3 and Exhibit 31.4, respectively. Because no financial statements are included in this Amendment and this Amendment does not contain or amend any disclosure with respect to Items 307 and 308 of Regulation S-K, paragraphs 3, 4, and 5 of the certifications have been omitted. Further, we are amending the cover page to update the number of shares of our stock outstanding and to remove the statement that information is being incorporated by reference from our definitive proxy statement.

Except as described above, this Amendment does not amend or otherwise update any other information in the Original Filing. Accordingly, this Amendment should be read in conjunction with the Original Filing. In addition, this Amendment does not reflect events that may have occurred subsequent to the date of the Original Filing.

As used in this Amendment, unless otherwise indicated, all references herein to “Xenetic,” the “Company,” “we” or “us” refer to Xenetic Biosciences, Inc. and its wholly owned subsidiaries.

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PART III

ITEM 10 – DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Directors and Executive Officers

Set forth below is the name, age, position and brief biographies of each of our executive officers and directors as of April 21, 2023.

Name	Age	Position
Mr. Jeffrey Eisenberg	57	Chief Executive Officer and Director
Dr. Curtis Lockshin	62	Chief Scientific Officer
Mr. James Parslow	58	Chief Financial Officer and Corporate Secretary
Dr. Grigory Borisenko	54	Director
Dr. James Callaway	66	Director (1), (2), (3)
Mr. Firdaus Jal Dastoor, FCS	70	Director (1), (2)
Dr. Roger Kornberg	75	Director (3)
Mr. Adam Logal	45	Director (1), (2), (3)
Dr. Alexey Vinogradov	52	Director

- (1) Member of the Audit Committee
- (2) Member of the Compensation Committee
- (3) Member of the Nominating and Corporate Governance Committee

Jeffrey Eisenberg was appointed our Chief Executive Officer on October 26, 2017, after serving as Chief Operating Officer since December 2, 2016, and has served as a member of our Board since July 2016. Mr. Eisenberg previously worked at Noven Pharmaceuticals, Inc. (“Noven”), a subsidiary of Hisamitsu Pharmaceutical, Inc., where he held various positions of increasing responsibility, most recently serving from 2009-2016 as Noven’s president, chief executive officer and as a member of its board of directors. Mr. Eisenberg previously served as an independent director for Mabvax Therapeutics Holdings, Inc. from February 2016 until his resignation in July 2018. Mr. Eisenberg obtained his J.D. at Columbia University Law School and a B.S. in Economics from the Wharton School, University of Pennsylvania. We believe Mr. Eisenberg’s significant life science executive experience and leadership experience in the areas of R&D, operations, manufacturing/quality, business development, strategic partnering, product development, commercialization, and human resources provides him with the appropriate set of skills to serve as a member of our Board.

Curtis Lockshin, PhD initially joined us on a part-time basis in March 2014 as our Vice President of Research & Operations and was appointed our Chief Scientific Officer effective January 1, 2017. Dr. Lockshin has held several management positions at development and commercial stage biotechnology companies, with experience including discovery, preclinical and clinical development, as well as commercial manufacturing. Since May 2013, he has held the position of president and chief executive officer of Guardum Pharmaceuticals LLC (“Guardum”), a wholly owned subsidiary of PJSC Pharmsynthez, a position which he continues to hold in addition to his position with us. Dr. Lockshin does not receive a salary for these services but did receive medical benefits and was covered under Guardum’s health plan through July 31, 2018. In addition, Dr. Lockshin has served as an officer or consultant of several biotechnology companies on a part-time basis, including as an officer of a series of related companies following multiple mergers beginning as chief executive officer and director of SciVac Therapeutics, Inc. and its subsidiary SciVac, Ltd., from September 2014 until July 2016. After SciVac Therapeutics, Inc.’s merger with VBI Vaccines, Inc. in July 2016, Dr. Lockshin served as chief technical officer of the merged company until December 2016. Dr. Lockshin is currently serving as a member of the board of directors of Phio Pharmaceuticals Corporation, a publicly traded clinical-stage RNAi company focused on immunoncology, a position he has held since April 2013. Dr. Lockshin has an S.B. in Life Sciences and a Ph.D. in Biological Chemistry from the Massachusetts Institute of Technology. Since April 2004, Dr. Lockshin has also served as a member of the board of directors of the Ruth K. Broad Biomedical Research Foundation, a Duke University Support Corporation that supports basic research related to Alzheimer’s disease and neurodegeneration via intramural, extramural and international grants.

James Parslow was appointed our Chief Financial Officer on April 3, 2017. Mr. Parslow most recently served as Chief Financial Officer, Treasurer and Secretary of World Energy Solutions, Inc., a publicly-traded business-to-business e-commerce company brokering energy and environmental commodities, from 2006 until its acquisition by EnerNOC, Inc. in 2015. From 2015 until 2017, he served as an independent consultant providing interim chief financial officer services to multiple emerging technology companies. Mr. Parslow is a Certified Public Accountant with over 35 years of experience serving private and public companies in the biotech, clean tech, e-commerce, and high-tech manufacturing industries. He holds an A.B. in Economics and Accounting from the College of the Holy Cross and an M.B.A. with a concentration in Finance from Bentley University.

Grigory Borisenko, PhD, was appointed to the Board in September 2019. Dr. Borisenko has over 20 years of scientific, management and strategic experience in the life science field. Since April 2022, Dr. Borisenko has been an independent consultant for a number of companies. Prior to that time, Dr. Borisenko served as an Investment Director of RUSNANO Management Company LLC, a venture capital & private equity management company in Russia, and has specialized in investment projects in life sciences from 2012 through March 31, 2022. Dr. Borisenko has served on the board of directors of Atea Pharmaceuticals, Inc., Adastral Pharmaceuticals, Inc., Nearmedic Pharm LLC, Novamedica LLC and RusnanoMedInvest LLC. Prior to his investment career, Dr. Borisenko held academic appointments with the University of Pittsburgh, Russian State Medical University and Institute of Medico-Biological Problems. He has co-authored over fifty peer-reviewed publications in leading biochemistry and cell biology journals. Dr. Borisenko received his M.S. and Ph.D. from the Russian State Medical University, and is a recipient of Fogarty International and International Fellowship Awards from NIH. We believe Dr. Borisenko’s extensive background in the life sciences and biotechnology industries provide him with the appropriate set of skills to serve as a member of our Board.

James Callaway, PhD was appointed to the Board on August 14, 2017. Dr. Callaway has over 30 years of experience in the execution of product development operations for biotherapeutics and currently serves as an independent board member of KalGene Pharmaceuticals (“KalGene”) and Nuravax. Dr. Callaway is a seasoned CEO within the venture-backed biotech community and over the course of his career he has built and operated several companies, transforming each from research companies to clinical stage operating entities. He also serves as a Corporate Strategy Consultant to the biotech community at Callaway Innovations. Dr. Callaway has served as CEO of privately-held biotech companies including KalGene, a company focused on disease-modifying therapies in Alzheimer’s Disease, ArmaGen, Inc., a BBB transport company, and CEBIX, Inc., a diabetic neuropathy company. Prior to these efforts, Dr. Callaway held multiple senior leadership positions at Elan Pharmaceuticals, including simultaneously acting as Head of Development and overseeing the complex partnership with Wyeth Pharmaceuticals in the Alzheimer’s disease immunotherapy program. He has developed antibodies for a wide-range of therapeutic applications over the past two decades, including treatments of multiple sclerosis (Tysabri®: pharmaceutical development), Alzheimer’s disease (bapineuzumab: Program Executive), and blood brain barrier transport, and has worked with the United States Food and Drug Administration on multiple orphan drug development programs. We believe Dr. Callaway’s significant life sciences executive, leadership and strategic experience in the area of biotherapeutics provides him with the appropriate set of skills to serve as a member of our Board.

Firdaus Jal Dastoor, FCS, was initially appointed as a member of our Board in January 2014 pursuant to terms of the agreement of our acquisition of Xenetic U.K. He has been employed by the Cyrus Poonawalla Group, a conglomerate in India with interests in horse breeding, biotech and life sciences, and financial services, in business development strategies and operational roles since October 1981. Mr. Dastoor is currently a Group Director in charge of Finance and Corporate Affairs and Company Secretary of the Serum Institute of India Private Limited at the Cyrus Poonawalla Group. He has been a Fellow Member of The Institute of Company Secretaries of India since 1990. Mr. Dastoor is on the board of several private companies operating in the fields of life sciences and biotech, international trade, financial services and quality standards certifications. Mr. Dastoor received a B.A. in Commerce from the University of Poona. We believe Mr. Dastoor’s knowledge of investments in the life sciences and biotechnology industries, and his finance and business development background provide him with the appropriate set of skills to serve as a member of our Board.

Roger Kornberg, PhD has served as a member of our Board since February 2016. Dr. Kornberg is a member of the U.S. National Academy of Sciences and the Winzer Professor of Medicine in the Department of Structural Biology at Stanford University. He earned his B.S. in chemistry from Harvard University in 1967 and his Ph.D. in

chemical physics from Stanford in 1972. He became a postdoctoral fellow at the Laboratory of Molecular Biology in Cambridge, England and then an assistant professor of biological chemistry at Harvard Medical School in 1976, before moving to his present position as professor of structural biology at Stanford Medical School in 1978. In 2006, Dr. Kornberg was awarded the Nobel Prize in Chemistry in recognition for his studies of the molecular basis of Eukaryotic Transcription, the process by which DNA is copied to RNA. Dr. Kornberg is also the recipient of several awards, including the 2001 Welch Prize, the highest award granted in the field of chemistry in the United States, and the 2002 Leopold Mayer Prize, the highest award granted in the field of biomedical sciences from the French Academy of Sciences. Dr. Kornberg has served as a director of Cocrystal Pharma, Inc. (NasdaqCM: COCP) since April 2020. We believe Dr. Kornberg's prior experience serving on the boards of directors of large organizations as well as his scientific background provides him with the appropriate set of skills to serve as a member of our Board.

Adam Logal was appointed to the Board in August 2017. Mr. Logal has 20 years of experience in the biopharmaceuticals industry. Since April 2014, Mr. Logal has served as Senior Vice President, Chief Financial Officer, Chief Accounting Officer and Treasurer of OPKO Health, Inc. ("OPKO"), a publicly-traded company, and from March 2007 until April 2014 served as OPKO's Vice President of Finance, Chief Accounting Officer and Treasurer. Mr. Logal served as a director of VBI Vaccines, Inc., a publicly-traded company, from May 2015 through October 2018 and served as its Audit Committee Chairman. Prior to joining OPKO, Mr. Logal served in various financial management roles at Nabi Biopharmaceuticals, a commercial stage biopharmaceutical company. Mr. Logal is a strategic finance executive with extensive experience in SEC compliance and reporting, domestic and international finance, strategic planning, cash flow management, budgeting, taxation, treasury and business development. We believe Mr. Logal's extensive financial experience with public companies in the life sciences industry provides him with the appropriate set of skills to serve as a member of our Board.

Alexey Vinogradov has served as a member of our Board since July 2019. Mr. Vinogradov currently works as Business Development Manager at Mag. Peter G. Wahl's Law Firm in Vienna, Austria, which main focus is on corporate, property and commercial law. Mr. Vinogradov previously acted as Business Development Director and Operations Director at Cantreva LLC, a Russian company with extensive specialized experience of delivering services in the field of renewable energy (solar, wind, hydro power), performing works on a "turnkey" basis from September 2017 to 2022. Mr. Vinogradov previously served as General Manager at Togas Middle East LLC in Dubai, UAE from May 2015 to May 2017. Prior to that, Mr. Vinogradov served as branch manager at Togas Group LLC in Russia from March 2012 to November 2016. We believe Mr. Vinogradov's experience in business communication, international business development and financial analytics provides him with the appropriate set of skills to serve as a member of our Board.

There are no family relationships among any of our directors and executive officers and, to the best of our knowledge, none of our directors or executive officers has, during the past ten years, been involved in any legal proceedings which are required to be disclosed pursuant to the rules and regulations of the SEC.

Board Role in Risk Oversight and Board Leadership

Our management is principally responsible for defining the various risks facing the Company, formulating risk management policies and procedures, and managing our risk exposures on a day-to-day basis. The Board's principal responsibility in this area is to ensure that sufficient resources, with appropriate technical and managerial skills, are provided throughout the Company to identify, assess and facilitate processes and practices to address material risk and to monitor our risk management processes by informing itself concerning our material risks and evaluating whether management has reasonable controls in place to address the material risks. The involvement of the Board in reviewing our business strategy is an integral aspect of the Board's assessment of management's tolerance for risk and its determination of what constitutes an appropriate level of risk for the Company.

We separate the roles of Chief Executive Officer and Board Chair in recognition of the differences between the two roles. The Board of Directors is currently chaired by independent director, Adam Logal, and our Chief Executive Officer, Jeffrey Eisenberg, is our only employee-director. The Chief Executive Officer is responsible for setting the strategic direction for the Company and the day to day leadership and performance of the Company, while the Board Chair is responsible for leading the Board in the execution of its fiduciary duties. The Board Chair presides over meetings of the full Board. While we recognize that different board leadership structures may be appropriate for companies in different situations, we believe our current leadership structure is the optimal structure for the Company at this time.

Our Board of Directors

During fiscal year 2022, the following served as a member of the Company's Board of Directors: Jeffrey Eisenberg, Dr. Grigory Borisenko, Dr. James Callaway, Firdaus Jal Dastoor, Dr. Roger Kornberg, Adam Logal and Alexey Vinogradov. Directors shall hold office for a one-year term or until their successors have been duly elected and qualified. Vacancies on the Board resulting from death, resignation, disqualification, removal, or other causes can be filled by the affirmative vote of a majority of the directors then in office. Any director so elected, shall hold office for the remainder of the full term of the director for which the vacancy was created or occurred and until such director's successor shall have been duly elected and qualified.

Committees of the Board

The Board has three standing committees: an Audit Committee, a Compensation Committee, and a Nominating and Corporate Governance Committee. The Board also has one special committee: the Financing Committee which was formed in August 2020. The Company has adopted charters to govern the conduct, authority and responsibilities of each of the Audit Committee, Compensation Committee and Nominating and Corporate Governance Committee, which are available to stockholders on the Company's website at <http://ir.xeneticbio.com/>. The information on our website is not incorporated by reference into, or a part of, this Amendment or the Original Filing.

Audit Committee

The Audit Committee of the Board of Directors was established by the Board in accordance with Section 3(a)(58)(A) of the Exchange Act to oversee the Company's corporate accounting and financial reporting processes and audits of its financial statements. For this purpose, the Audit Committee performs several functions. The Audit Committee evaluates the performance of and assesses the qualifications of the independent auditors; determines and approves the engagement of the independent auditors; determines whether to retain or terminate the existing independent auditors or to appoint and engage new independent auditors; reviews and approves the retention of the independent auditors to perform any proposed permissible non-audit services; monitors the rotation of partners of the independent auditors on the Company's audit engagement team as required by law; reviews and approves or rejects transactions between the Company and any related persons; confers with management and the independent auditors regarding the effectiveness of internal control over financial reporting; establishes procedures, as required under applicable law, for the receipt, retention and treatment of complaints received by the Company regarding accounting, internal accounting controls or auditing matters and the confidential and anonymous submission by employees of concerns regarding questionable accounting or auditing matters; and meets to review the Company's annual audited financial statements and quarterly financial statements with management and the independent auditor, including a review of the Company's disclosures under the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of the Company's Annual Report to Stockholders on Form 10-K.

For the fiscal year 2022, the Audit Committee was composed of three directors: Mr. Dastoor, Dr. Callaway, and Mr. Logal (chair). The Audit Committee met five times during fiscal year 2022. The Board has adopted a written Audit Committee charter that is available to stockholders on the Company's website at <http://ir.xeneticbio.com/>. The information on our website is not incorporated by reference into, or a part of, this Amendment or the Original Filing.

The Board of Directors reviews the Nasdaq Stock Market LLC ("Nasdaq") listing standards definition of independence for Audit Committee members on an annual basis and has determined that all current members of our Audit Committee are independent (as independence is currently defined in Rule 5605(c)(2)(A)(i) and (ii) of the Nasdaq listing standards).

The Board of Directors has also determined that Mr. Logal qualifies as an "audit committee financial expert," as defined in applicable SEC rules. The Board made a qualitative assessment of Mr. Logal's level of knowledge and experience based on a number of factors, including his formal education and experience as a chief financial officer.

Director Nominations

No material changes have been made to the procedures by which stockholders may recommend nominees to our Board.

Code of Business Conduct and Ethics

We have adopted the Xenetic Biosciences, Inc. Code of Business Conduct and Ethics that applies to all of our employees, officers and directors, including our principal executive officer, principal financial officer and principal accounting officer. The Code of Business Conduct and Ethics is available on our website, www.xeneticbio.com, under "Investors" at "Corporate Governance." If we make any substantive amendments to the Code of Business Conduct and Ethics or grant any waiver from a provision of the Code of Business Conduct and Ethics to any executive officer or director, we intend to promptly disclose the nature of the amendment or waiver on our website, to the extent required by the applicable rules and exchange requirements. The information on our website is not incorporated by reference into, or a part of, this Amendment or the Original Filing.

ITEM 11 – EXECUTIVE COMPENSATION

Summary Compensation Table – 2021 - 2022

The following table sets forth, for the years ended December 31, 2022 and 2021, the compensation information for Jeffrey Eisenberg, our Chief Executive Officer, Dr. Curtis Lockshin, our Chief Scientific Officer, and James Parslow, our Chief Financial Officer. We refer to Messrs. Eisenberg, Lockshin, and Parslow herein, collectively, as our "named executive officers."

Name and Principal Position	Year	Salary (\$)	Option Awards ⁽¹⁾ (\$)	Non-Equity Incentive Plan Compensation ⁽²⁾ (\$)	All Other Compensation (\$)	Total (\$)
Jeffrey F. Eisenberg, Chief Executive Officer	2022	\$ 404,250	\$ 98,882	\$ 99,041	\$ 30,654 ⁽³⁾	\$ 632,827
	2021	\$ 367,500	\$ 234,052	\$ 119,438	\$ 29,241	\$ 750,231
James Parslow, Chief Financial Officer	2022	\$ 329,175	\$ 49,441	\$ 56,455	\$ 38,919 ⁽⁴⁾	\$ 473,990
	2021	\$ 299,250	\$ 117,026	\$ 68,079	\$ 36,454	\$ 520,809
Dr. Curtis Lockshin, Chief Scientific Officer	2022	\$ 329,175	\$ 49,441	\$ 56,455	\$ 35,300 ⁽⁵⁾	\$ 470,371
	2021	\$ 299,250	\$ 117,026	\$ 68,079	\$ 23,965	\$ 508,320

(1) The amounts represent the aggregate grant date fair value of stock options granted in the applicable fiscal year, computed in accordance with Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 718, excluding the effect of estimated forfeitures. Assumptions used in the calculation of this amount are set forth in Note 12 to our audited consolidated financial statements included in Item 8 of the Original Filing. Mr. Eisenberg, Mr. Parslow, and Dr. Lockshin were granted options to purchase 100,000 shares, 50,000 shares and 50,000 shares of common stock, respectively, during 2022.

(2) Represents incentive compensation payments earned.

(3) Includes \$18,454 for health and welfare plans and \$12,200 employer matching 401(k) contribution.

(4) Includes \$26,870 for health and welfare plans and \$12,049 employer matching 401(k) contribution.

(5) Includes \$24,347 for health and welfare plans and \$10,953 employer matching 401(k) contribution.

401(k) Plan

The Company provides all full-time employees, including our named executive officers, with the opportunity to participate in a defined contribution 401(k) plan. Our 401(k) plan is intended to qualify under Section 401 of the Internal Revenue Code so that employee pre-tax contributions and income earned on such contributions are not taxable to employees until withdrawn. Employees may elect to defer up to 80 percent of their eligible compensation (not to exceed the statutorily prescribed annual limit) in the form of elective deferral contributions to our 401(k) plan. Our 401(k) plan also has a "catch-up contribution" feature for employees aged 50 or older (including those who qualify as "highly compensated" employees) who can defer amounts over the statutory limit that applies to all other employees. The 401(k) plan matches 100% of employee contributions up to a maximum of 4% of employees' salary. Matching contributions are fully vested at the time of contribution.

Outstanding Equity Awards at Fiscal Year-End – 2022

The following table sets forth certain information with respect to outstanding equity awards held by our named executive officers at December 31, 2022.

Option Awards

Stock Awards

Name	Number of Securities Underlying Unexercised Options, Exercisable	Number of Securities Underlying Unexercised Options, Unexercisable	Option Exercise Price (\$)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested	Market Value of Shares or Units of Stock That Have Not Vested (\$)
Jeffrey F. Eisenberg	19,168 ⁽¹⁾	–	40.92	12/2/2026	–	–
	10,417 ⁽²⁾	–	25.32	10/26/2027	–	–
	230,000 ⁽³⁾	–	1.31	12/4/2029	–	–
	58,333 ⁽⁴⁾	41,667 ⁽⁴⁾	2.60	3/18/2031	–	–
	– ⁽⁵⁾	100,000 ⁽⁵⁾	1.12	3/24/2032	–	–
James Parslow	14,584 ⁽⁶⁾	–	54.84	4/3/2027	–	–
	80,000 ⁽⁷⁾	–	1.31	12/4/2029	–	–
	29,167 ⁽⁸⁾	20,833 ⁽⁸⁾	2.60	3/18/2031	–	–
	– ⁽⁹⁾	50,000 ⁽⁹⁾	1.12	3/24/2032	–	–
Curtis Lockshin	1,213 ⁽¹⁰⁾	–	55.08	12/31/2024	–	–
	1,263 ⁽¹¹⁾	–	55.08	9/6/2025	–	–
	14,584 ⁽¹²⁾	–	51.60	1/1/2027	–	–
	90,000 ⁽¹³⁾	–	1.31	12/4/2029	–	–
	29,167 ⁽¹⁴⁾	20,833 ⁽¹⁴⁾	2.60	3/18/2031	–	–
	– ⁽¹⁵⁾	50,000 ⁽¹⁵⁾	1.12	3/24/2032	–	–

- (1) 392 shares vested 100% on the date of grant. Remainder vested one-third upon the first anniversary of the grant date, one-third of the remaining amount upon the second anniversary of the grant date and one-third of the remaining amount on the third anniversary of the grant date.
- (2) Vested one-third upon the first anniversary of the grant date, one-third upon the second anniversary of the grant date and one-third upon the third anniversary of the grant date.
- (3) Vested one-third upon the first anniversary of the grant date, one-third upon the second anniversary of the grant date and one-third upon the third anniversary of the grant date.
- (4) Vests one-third upon the first anniversary of the grant date and the remaining two-thirds over eight equal quarterly installments commencing June 18, 2022 and ending on March 18, 2024.
- (5) Vests one-third upon the first anniversary of the grant date and the remaining two-thirds over eight equal quarterly installments commencing June 24, 2023 and ending on March 24, 2025.
- (6) Vested one-third upon the first anniversary of the grant date, one-third upon the second anniversary of the grant date and one-third upon the third anniversary of the grant date.
- (7) Vested one-third upon the first anniversary of the grant date, one-third upon the second anniversary of the grant date and one-third upon the third anniversary of the grant date.
- (8) Vests one-third upon the first anniversary of the grant date and the remaining two-thirds over eight equal quarterly installments commencing June 18, 2022 and ending on March 18, 2024.
- (9) Vests one-third upon the first anniversary of the grant date and the remaining two-thirds over eight equal quarterly installments commencing June 24, 2023 and ending on March 24, 2025.
- (10) Vested one-third upon March 3, 2015, one-third upon March 15, 2016 and one-third upon March 15, 2017.
- (11) Vested one-third upon the first anniversary of the grant date, one-third upon the second anniversary of the grant date and one-third upon the third anniversary of the grant date.
- (12) Vested one-third upon the first anniversary of the grant date, one-third upon the second anniversary of the grant date and one-third upon the third anniversary of the grant date.
- (13) Vested one-third upon the first anniversary of the grant date, one-third upon the second anniversary of the grant date and one-third upon the third anniversary of the grant date.
- (14) Vests one-third upon the first anniversary of the grant date and the remaining two-thirds over eight equal quarterly installments commencing June 18, 2022 and ending on March 18, 2024.
- (15) Vests one-third upon the first anniversary of the grant date and the remaining two-thirds over eight equal quarterly installments commencing June 24, 2023 and ending on March 24, 2025.

Pay Versus Performance Disclosure

The following tables and related disclosures provide information about (i) the “total compensation” of our CEO, and our other named executive officers (the “Other NEOs” or the “Non-CEO NEOs”) as presented in the Summary Compensation Table within this proxy statement, (ii) the “compensation actually paid” to our CEO and our Other NEOs, as calculated pursuant to the SEC’s pay-versus-performance rules, (iii) certain financial performance measures, and (iv) the relationship of the “compensation actually paid” to those financial performance measures.

This disclosure has been prepared in accordance with Item 402(v) of Regulation S-K under the Securities Exchange Act of 1934, as amended, and does not necessarily reflect value actually realized by the executives or how our compensation committee evaluates compensation decisions in light of company or individual performance.

Year	Summary Compensation Table Total for CEO ⁽¹⁾ (\$)	Compensation Actually Paid to CEO ⁽¹⁾⁽²⁾⁽³⁾ (\$)	Average Summary Compensation Table for Non-CEO NEOs ⁽¹⁾ (\$)	Average Compensation Actually Paid to Non-CEO NEOs ⁽¹⁾⁽²⁾⁽³⁾ (\$)	Value of Initial Fixed \$100 Investment Based on Total Shareholder Return ⁽⁴⁾ (\$)	Net Loss (\$)
2022	\$ 632,827	\$ 425,619	\$ 472,180	\$ 377,162	\$ 13.98	\$ (6,552,353)
2021	\$ 750,231	\$ 505,360	\$ 514,564	\$ 407,285	\$ 63.24	\$ (5,645,179)

- (1) The CEO for 2022 and 2021 is Jeffrey Eisenberg. The Non-CEO NEOs for whom average compensation is presented in this table for 2022 and 2021 are James Parslow and Dr. Curtis Lockshin.

- (2) The amounts shown as Compensation Actually Paid have been calculated in accordance with Item 402(v) of Regulation S-K and do not reflect compensation actually realized or received by the Company's NEOs. These amounts reflect total compensation as set forth in the Summary Compensation Table for each year, adjusted as described in footnote 3 below.
- (3) Compensation Actually Paid reflects the exclusions and inclusions for the CEO and the Non-CEO NEOs set forth below. Amounts excluded, which are set forth in the table below in the "Minus Stock and Option Awards from Summ. Comp. Table" columns below, represent the Stock Awards and Option Awards reported in the Stock Awards and Option Awards columns of the Summary Compensation Table for each applicable year. Amounts added back to determine Compensation Actually Paid are made up of the following components as applicable: (i) the fair value as of the end of the fiscal year of outstanding and unvested equity awards granted in that year; (ii) the change in fair value during the year of equity awards granted in prior years that remained outstanding and unvested at the end of the year; (iii) the fair value as of the vesting date of equity awards that were granted and vested in that year, if any and (iv) the change in fair value during the year through the vesting date of equity awards granted in prior years that vested during that year. The fair value at the end of the prior year of awards granted in any prior year that failed to meet applicable vesting conditions during the covered year are subtracted, although there were no such awards for the CEO or the Non-CEO NEOs in 2021 or 2022. Equity values are calculated in accordance with ASC Topic 718.

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Year	Summary Comp. Table Total for CEO	Minus Stock and Option Awards from Summ. Comp. Table	Plus Year-End Equity Value of Unvested Awards Granted During Year	Plus Change in Value of Unvested Awards Granted in Prior Years	Plus Change in Value of Prior Years' Awards Vested During Year	Comp. Actually Paid to CEO
2022	\$632,827	\$98,882	\$20,922	\$(37,387)	\$(91,861)	\$425,619
2021	\$750,232	\$234,052	\$105,377	\$(57,273)	\$(58,924)	\$505,360

Year	Avg. Summary Comp. Table Total for Other NEOs	Minus Avg. Stock and Option Awards from Summ. Comp. Table	Plus Avg. Year-End Equity Value of Unvested Awards Granted During Year	Plus Avg. Change in Value of Unvested Awards Granted in Prior Years	Plus Avg. Change in Value of Prior Years' Awards Vested During Year	Average Comp. Actually Paid to Other NEOs
2022	\$472,180	\$49,441	\$10,461	\$(18,693)	\$(37,345)	\$377,162
2021	\$514,564	\$117,026	\$52,689	\$(21,166)	\$(21,776)	\$407,285

For the equity values included in the above tables, the valuation assumptions used to calculate fair values of stock options were materially different from those disclosed at the time of the grant of the stock options. The assumptions used in determining fair value of the stock options that vested during 2021 and 2022, or that were outstanding as of December 31, 2021 or December 31, 2022, as applicable, are as follows:

	Options Vested During Year or Outstanding on December 31 of:	
	2022	2021
Expected Volatility	123.60% - 135.86%	132.43% - 137.44%
Risk-Free Interest Rate	2.15% - 4.05%	1.00% - 1.27%
Expected Dividend Yield	0%	0%
Expected Term (in years)	3.5 - 5.12	4.0 - 5.12

- (4) Total Shareholder Return illustrates the value, as of the last day of the indicated fiscal year of an investment of \$100 in Xenetic common stock on December 31, 2020.

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Description of Relationship Between NEO Compensation Actually Paid and Company Total Shareholder Return ("TSR") and Net Loss

The Compensation Actually Paid to our CEO and the average of Compensation Actually Paid to our Non-CEO NEOs declined in 2022, which corresponded to the decline in the Company's TSR and increase in Net Loss in 2022. The CEO and Non-CEO NEOs Non-Equity Incentive Plan Compensation is determined based on our strategic, financial and operating performance objectives that have been established by the Compensation Committee. While not directly tied to stock price performance and/or net loss, these performance objectives have been established as core drivers of TSR.

Employment Agreements with our Named Executive Officers

Employment Agreement with Mr. Eisenberg

We entered into an employment agreement with Mr. Eisenberg effective as of December 1, 2016 for him to serve as Chief Operating Officer (the "Original Agreement"). The Original Agreement was for an initial term of one year, and automatically renewed for successive one year periods unless either party gave notice to the other no later than 90 days prior to the expiration of the then-applicable term; provided, however, that we could terminate the Original Agreement at any time. Mr. Eisenberg's annual salary under the Original Agreement was \$300,000, and was subject to annual review and upward adjustment only by the Compensation Committee of the Board. Mr. Eisenberg was also eligible to receive a bonus equal to 35% of his annual salary based on the attainment of certain individual and/or Company goals established by the Board or a committee thereto. Mr. Eisenberg was also eligible to participate in our employee benefit, welfare and other plans, as may be maintained by us from time to time, on a basis no less favorable than those provided to other similarly situated executives of the Company. Mr. Eisenberg was also subject to certain customary confidentiality, non-solicitation and non-competition provisions.

Under the Original Agreement, if Mr. Eisenberg's employment was terminated by us without "Cause" (as defined in the Original Agreement) or if he resigned for "Good Reason" (as defined in the Original Agreement), he was entitled to receive (i) six months of his then current base salary, paid over time in accordance with our payroll practices then in effect if he had been employed by us for six months or less, (ii) 12 months of his then current base salary, paid over time in accordance with our payroll practices then in effect if he had been employed by us for more than six months, (iii) a pro-rated annual bonus and (iv) payment of premiums for continued health benefits under COBRA for up to six months.

On October 26, 2017, the Company amended and restated the Original Agreement in order to employ Mr. Eisenberg as the Chief Executive Officer of the Company, effective as of the same date (the "Amended Agreement"). The terms of the Amended Agreement were substantially similar to the terms of the Original Agreement, except that Mr.

Eisenberg is now eligible to receive a bonus equal to 50% of his annual salary based on the attainment of certain individual and/or Company goals established by the Board or a committee thereto, and if Mr. Eisenberg's employment is terminated by us without "Cause" (as defined in the Amended Agreement) or if he resigns for "Good Reason" (as defined in the Amended Agreement), he will be entitled to receive (i) within thirty days following the date of termination, an amount equal to one times his then current base salary, (ii) a pro-rated annual bonus and (iii) payment of premiums for continued health benefits under COBRA for up to twelve months.

Employment Agreement with Mr. Parslow

We entered into an employment agreement with Mr. Parslow effective as of April 3, 2017 (the "Parslow Employment Agreement"). The Parslow Employment Agreement does not provide for a specified term of employment and Mr. Parslow's employment will be on an at-will basis. Mr. Parslow received an initial annual base salary of \$265,000 and is eligible to earn an annual cash incentive bonus, which is set at a target aggregate bonus amount of 35% of Mr. Parslow's base salary, upon achievement of certain individual and/or Company performance goals set by the Compensation Committee. Mr. Parslow is also eligible to participate in the Company's employee benefit, welfare and other plans, as may be maintained by the Company from time to time, on a basis no less favorable than those provided to other similarly-situated executives of the Company. Mr. Parslow is also subject to certain customary confidentiality, non-solicitation and non-competition provisions.

If Mr. Parslow's employment is terminated by the Company without "cause" (as defined in the Parslow Employment Agreement) or Mr. Parslow resigns for "good reason" (as defined in the Parslow Employment Agreement), he will be entitled to receive (i) one year of his then current base salary, paid over time in accordance with the Company's payroll practices then in effect and (ii) payment of premiums for continued health benefits under COBRA for up to one year.

Employment Agreement with Dr. Lockshin

We entered into an employment agreement with Dr. Lockshin effective as of January 1, 2017 (the "Lockshin Employment Agreement"). The Lockshin Employment Agreement does not provide for a specified term of employment and Dr. Lockshin's employment will be on an at-will basis. Dr. Lockshin received an initial annual base salary of \$250,000 and is eligible to earn an annual performance-based cash incentive bonus, which is set at a target aggregate bonus amount of 35% of Dr. Lockshin's base salary, upon achievement of certain individual and/or Company performance goals established by the Board or a committee thereto. Dr. Lockshin is also eligible to participate in the Company's employee benefit, welfare and other plans, as may be maintained by the Company from time to time, on a basis no less favorable than those provided to other similarly-situated executives of the Company. Dr. Lockshin is also subject to certain customary confidentiality, non-solicitation and non-competition provisions.

If Dr. Lockshin's employment is terminated by the Company without "Cause" (as defined in the Lockshin Employment Agreement) or Dr. Lockshin terminates his employment for "Good Reason" (as defined in the Lockshin Employment Agreement) and Dr. Lockshin executes and does not revoke a general release of claims against the Company, then he will be entitled to receive (i) one year of his then current base salary, paid over time in accordance with the Company's payroll practices then in effect and (ii) payment of premiums for continued health benefits under COBRA for up to twelve months.

Potential Payments Upon Termination or Change of Control

Our named executive officers may be entitled to payments upon termination or change of control. The details of such payments are included in the description of their employment agreements above.

Director Compensation

Each of our non-employee, independent directors is currently entitled to receive an annual retainer of \$50,000, payable in equal quarterly installments, an option to acquire 25,000 shares of the Company's common stock upon initial appointment to the Board, and an additional option to acquire 25,000 shares each year thereafter on the date of the Company's annual meeting of stockholders. All members of our Board are reimbursed for their usual and customary expenses incurred in connection with their service on the Board, including out-of-pocket expenses, transportation, and airfare on the Company's business.

Director Compensation Table

As an employee director during fiscal year 2022, Mr. Eisenberg did not receive any compensation for his Board service during the last completed year. The following table sets forth information for the year ended December 31, 2022 regarding the compensation awarded to, earned by or paid to our non-employee directors:

Name	Fees Earned or Paid in Cash (\$)	Stock Awards (\$)	Option Awards⁽¹⁾⁽²⁾ (\$)	All Other Compensation (\$)	Total (\$)
Dr. Grigory Borisenko	\$ 50,000	–	\$ 9,563	–	\$ 59,563
Dr. James Callaway	\$ 50,000	–	\$ 9,563	–	\$ 59,563
Firdaus Jal Dastoor	\$ 50,000	–	\$ 9,563	–	\$ 59,563
Dr. Roger Kornberg	\$ 50,000	–	\$ 9,563	–	\$ 59,563
Mr. Adam Logal	\$ 50,000	–	\$ 9,563	–	\$ 59,563
Dr. Alexey Vinogradov	\$ 50,000	–	\$ 9,563	–	\$ 59,563

(1) The amounts represent the aggregate grant date fair value of stock options granted during 2022, computed in accordance with FASB ASC Topic 718. For a discussion of the assumptions and methodology used to calculate the value of our stock options, see Note 12 to our audited financial statements included in Item 8 of the Original Filing.

(2) The table below shows the aggregate number of option awards outstanding for each of our non-employee directors as of December 31, 2022:

Name	Option Awards (#)
Dr. Grigory Borisenko	25,000
Dr. James Callaway	104,168
Firdaus Jal Dastoor	107,956

Dr. Roger Kornberg	106,252
Adam Logal	104,168
Dr. Alexey Vinogradov	100,000

See “Certain Related Person Transactions” below for compensation arrangements involving specific members of the Board.

ITEM 12 – SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The following table and footnotes set forth certain information known to us regarding beneficial ownership of our capital stock as of March 31, 2023 for:

- each person known by us to be the beneficial owner of more than 5% of our capital stock;
- our named executive officers;
- each of our directors; and
- all executive officers and directors as a group.

The number of shares beneficially owned by each entity, person, director or executive officer is determined in accordance with the rules of the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. Under such rules, beneficial ownership includes any shares over which the individual has sole or shared voting power or investment power as well as any shares that the individual has the right to acquire within 60 days through the exercise of any stock option, warrants or other rights. Except as otherwise indicated, and subject to applicable community property laws, the persons named in the table have sole voting and investment power with respect to all shares of common stock held by that person or entity.

The percentage of shares beneficially owned is computed on the basis of 15,166,596 shares of our common stock outstanding as of March 31, 2023, on an as-converted basis. Shares of our common stock that a person has the right to acquire within 60 days after March 31, 2023 are deemed outstanding for purposes of computing the percentage ownership of the person or entity holding such rights, but are not deemed outstanding for purposes of computing the percentage ownership of any other person, except with respect to the percentage ownership of all directors and executive officers as a group. Unless otherwise indicated below, the address for each beneficial owner listed is c/o Xenetic Biosciences, Inc., at 945 Concord Street, Framingham, Massachusetts 01701.

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Name of Beneficial Owner	Number of Shares Beneficially Owned ⁽¹⁾	Percentage of Class Beneficially Owned
Fiscal Year 2022 Named Executive Officers and Directors		
Jeffrey Eisenberg	363,752 ⁽²⁾	2.3%
James Parslow	144,584 ⁽³⁾	*
Dr. Curtis Lockshin	157,060 ⁽⁴⁾	1.0%
Dr. Grigory Borisenko ⁽⁵⁾	–	*
Dr. James Callaway	79,168 ⁽⁶⁾	*
Firdaus Jal Dastoor	82,956 ⁽⁷⁾	*
Dr. Roger Kornberg	81,252 ⁽⁸⁾	*
Adam Logal	79,168 ⁽⁹⁾	*
Alexey Vinogradov	261,781 ⁽¹⁰⁾	1.7%
All executive officers and directors as a group (9 persons)	1,249,721 ⁽¹¹⁾	7.7%
5% Current Stockholders		
CLS Therapeutics Ltd.	1,475,000 ⁽¹²⁾	9.7%
PJSC Pharmsynthez ⁽⁵⁾	898,366 ⁽¹³⁾	5.8%

* Represents beneficial ownership of less than one percent (1%).

- (1) Unless otherwise indicated below, this table is based upon corporate records, information supplied by officers, directors and, in the case of principal stockholders, information provided by our transfer agent.
- (2) The total beneficial ownership consists of 359,585 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023 and 4,167 of vested restricted stock units.
- (3) The total beneficial ownership consists of 144,584 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023.
- (4) The total beneficial ownership consists of 157,060 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023.
- (5) Dr. Borisenko was employed by Rusnano LLC, an entity affiliated with Pharmsynthez, through March 31, 2022.
- (6) The total beneficial ownership consists of 79,168 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023.
- (7) The total beneficial ownership consists of 82,956 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023.
- (8) The total beneficial ownership consists of 81,252 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023.
- (9) The total beneficial ownership consists of 79,168 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023.
- (10) The total beneficial ownership consists of 186,781 shares of common stock owned directly and 75,000 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023.
- (11) The total beneficial ownership consists of 186,781 shares of common stock owned directly, 1,058,773 shares issuable upon exercise of options that are exercisable within 60 days of March 31, 2023 and 4,167 shares of restricted stock units that are vested.
- (12) The total beneficial ownership consists of 625,000 shares of common stock owned directly or indirectly by CLS Therapeutics, Ltd. (“CLS”) and 850,000 shares issued on October 12, 2022 to CLS Therapeutics, LLC, an affiliate of CLS, as consideration for the assignment by CLS and its affiliates to the Company of certain patent rights owned by CLS and its affiliates. The address of CLS Therapeutics, Ltd. is Frances House, Sir William Place, St. Peter Port Guernsey, Channel Islands GY1 4HQ.
- (13) The total beneficial ownership consists of 447,122 shares of common stock owned directly or indirectly through SynBio and 451,244 shares issuable upon the conversion of Series B Preferred Stock that are exercisable within 60 days of March 31, 2023. SynBio is a wholly-owned subsidiary of Pharmsynthez. Pharmsynthez may be deemed to have shared voting and shared dispositive power with respect to all the shares owned by SynBio and therefore, Pharmsynthez may be deemed to be the beneficial owner of such shares. The address of PJSC Pharmsynthez is 9 Korpunaya Street, Letter A 1st Floor, St. Petersburg, 197110, Russia.

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Section 16(a) of the Exchange Act requires our directors and executive officers, and persons who own more than ten percent of a registered class of our equity securities, to file with the SEC initial reports of ownership and reports of changes in ownership of our ordinary shares and other equity securities. Such persons are required by SEC regulations to furnish us with copies of all Section 16(a) forms they file.

To our knowledge, based solely on a review of the copies of such reports furnished to us and written representations that no other reports were required, during the fiscal year ended December 31, 2022, we believe that all Section 16(a) filing requirements applicable to our executive officers, directors and greater than 10% beneficial owners were complied with.

Equity Compensation Plan Information

The following table sets forth information as of December 31, 2022 with respect to compensation plans under which equity securities are authorized for issuance:

Plan Category	Number of Securities to be Issued upon Exercise of Outstanding Options, Warrants and Rights (a)	Weighted Average Exercise Price of Outstanding Options, Warrants and Rights (b)	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders	1,448,380 ⁽¹⁾	\$ 4.53	1,077,257
Equity compensation plans not approved by security holders	14,584 ⁽²⁾	54.84	—
Total	<u>1,462,964</u>	<u>\$ 5.04</u>	<u>1,077,257</u>

(1) Consists of 1,448,380 shares of our common stock to be issued upon the exercise of outstanding stock options and restricted stock units under the Xenetic Biosciences, Inc. Amended and Restated Equity Incentive Plan (“Equity Plan.”)

(2) Represents inducement award granted to Mr. Parslow in 2017 in connection with his employment with the Company that was not covered under the Equity Plan in accordance with Nasdaq Listing Rule 5635(c)(4). The option has a ten-year term and is fully vested.

ITEM 13 – CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

During the fiscal years ended December 31, 2022 and December 31, 2021, there was not, nor is there any currently proposed transaction or series of similar transactions to which Xenetic was or is to be a party in which the amount involved exceeded or exceeds the lesser of \$120,000 or 1% of the average of our total assets at year end for the last two completed fiscal years and in which any executive officer, director or holder of more than 5% of any class of voting securities of Xenetic and members of that person’s immediate family had, has or will have a direct or indirect material interest, other than as set forth in “Executive Compensation” and “Director Compensation Table” above and as disclosed below.

Policy Regarding Related Party Transactions

Our Board adopted an amended written related party transaction policy on August 27, 2020 to set forth the policies and procedures for the review and approval or ratification of related party transactions by our audit committee, which replaced the policy previously adopted in November 1, 2016. Any transaction between the Company and its officers, directors, principal stockholders or affiliates is required to be on terms no less favorable to us than could be reasonably obtained in arms-length transactions with independent third-parties. Transactions described in this section that occurred prior to November 1, 2016 were not covered by the Company’s related party transaction policy.

Certain Related Person Transactions

PJSC Pharmsynthez

Pharmsynthez directly, and indirectly through its wholly-owned subsidiary SynBio LLC (“SynBio”), had a share ownership in the Company of approximately 3% of the total outstanding common stock at March 31, 2023. In addition to its common stock ownership, Pharmsynthez holds approximately 1.5 million shares of our outstanding Series B Preferred Stock at March 31, 2023 and all of our outstanding Series A Preferred Stock. In addition, one of our former directors, Dr. Dmitry Genkin, is the Executive Chairman of the board of directors of Pharmsynthez, and, prior to March 31, 2022, Dr. Grigory Borisenko, one of our current directors, was employed as the Investment Director of Rusnano LLC, an entity affiliated with Pharmsynthez. Additionally, one of our executive officers, Dr. Curtis Lockshin, is an officer of a wholly-owned subsidiary of Pharmsynthez. In November 2009, the Company entered into a collaborative research and development license agreement with Pharmsynthez (the “Pharmsynthez Arrangement”) pursuant to which the Company granted an exclusive license to Pharmsynthez to develop, commercialize and market six product candidates based on the Company’s PolyXen and ImuXen technology in certain territories. In exchange, Pharmsynthez granted an exclusive license to the Company to use any preclinical and clinical data developed by Pharmsynthez, within the scope of the Pharmsynthez Arrangement, and to engage in further research, development and commercialization of drug candidates outside of certain territories at the Company’s own expense.

On June 12, 2020, the Company and Pharmsynthez entered into a Master Services Agreement (“MSA”) to advance the development of the Company’s XCART technology for B-cell malignancies. Under the MSA, Pharmsynthez agreed to provide services pursuant to work orders agreed upon by the parties from time to time, which services include, but are not limited to, acting as the Company’s primary contract research organization to assist in managing collaborations with multiple academic institutions in Russia and Belarus. The Company is required to pay reasonable fees, expenses and pass-through costs incurred by Pharmsynthez in providing the services in accordance with a budget and payment terms set forth in each work order. Additionally, in the event that a work order provides for milestone payments, the Company is required to make such payments to Pharmsynthez, or third party service providers designated by Pharmsynthez, in accordance with the terms set forth in the work order, which milestone payments may be made, at the sole discretion of the Company, in cash or shares of the Company’s common stock.

The Company and Pharmsynthez executed a work order on June 12, 2020 (the “Work Order”) under the Pharmsynthez MSA pursuant to which Pharmsynthez agreed to conduct a Stage 1 study of the Company’s XCART technology under the research program as set forth in the Work Order. The activities to be performed under the Work Order were expected to take approximately 20 months unless earlier terminated in accordance with the Pharmsynthez MSA. The Work Order provided for additional pass-through costs to be invoiced by Pharmsynthez upon execution of contracts with third party sites. Additionally, the Work Order provided for milestone payments of up to an aggregate of \$1,050,000, or, in the Company’s sole discretion, up to an aggregate of 1,000,000 shares of the Company’s common stock, to be paid or issued, as applicable, by the Company upon achievement of milestones associated with completion of early stages of the research program as set forth in the Work Order.

On October 12, 2021, the Company entered into Amendment Number One to the Pharmsynthez MSA (the “MSA Amendment”) with Pharmsynthez to, among other things, terminate all work orders under the Pharmsynthez MSA. As a result, no further services were to be performed under the Work Order and any additional services will be covered

by new work orders. In exchange, the Company entered into a new work order (the “Second Work Order”) simultaneously with the MSA Amendment. Under the terms of the Second Work Order, Pharmsynthez shall provide certain enumerated services to support the Company’s development of its XCART technology upon the written request of the Company, which work may be requested by the Company from time to time.

Pursuant to the MSA Amendment and Second Work Order, upon entry into the Second Work Order, the Company made a one-time \$40,000 payment to Pharmsynthez, of which \$21,000 was a one-time payment in full for all money and other compensation owed by the Company under the Work Order, and the remaining \$19,000 will be creditable against any out of pocket costs and expenses incurred by Pharmsynthez on behalf of the Company pursuant to any new work orders initiated after the effective date of the MSA Amendment, including the Second Work Order. There was no work performed and expense recognized under these agreements during the year ended December 31, 2022.

During the fourth quarter of 2019, the Company entered into a loan agreement with Pharmsynthez (the “Pharmsynthez Loan”), pursuant to which the Company advanced Pharmsynthez an aggregate principal amount of up to \$500,000 to be used for the development of a specific product under the Company’s Co-Development Agreement with Pharmsynthez. The Pharmsynthez Loan had a term of 15-months and accrued interest at a rate of 10% per annum. The Pharmsynthez Loan is guaranteed by all of the operating subsidiaries of Pharmsynthez, including SynBio and AS Kevelt (“Kevelt”), and is secured by all of the common and preferred stock of the Company owned by Pharmsynthez and SynBio. The Company recognized approximately \$9,000 and \$48,000 of interest income related to this loan during the twelve-months ended December 31, 2022 and 2021, respectively.

Effective January 23, 2021, the Company entered into a First Amendment to Loan Agreement and Other Loan Documents with Pharmsynthez, Kevelt and SynBio (the “Pharmsynthez Loan Extension”) to modify the repayment terms and maturity of the Pharmsynthez Loan to January 2022. The terms of the Pharmsynthez Loan Extension called for two (2) equal monthly principal payments of \$25,000 in each of January 23, 2021 and February 28, 2021 and the payment of all outstanding accrued interest in six (6) equal monthly installments from January 31, 2021 through June 30, 2021. In addition, the Pharmsynthez Loan Extension required monthly interest payments and the repayment of the remaining principal amount in six (6) equal monthly installments from August 2021 through January 2022.

Effective August 31, 2021, the Company entered into a Second Amendment to Loan Agreement and Other Loan Documents with Pharmsynthez, Kevelt and SynBio (the “Second Pharmsynthez Loan Extension”) to modify the repayment terms and maturity of the Pharmsynthez Loan to July 2022. The terms of the Second Pharmsynthez Loan Extension called for an upfront fee of \$12,500 and two (2) equal monthly principal payments of \$25,000 on September 30, 2021 and October 31, 2021. In addition, the Second Pharmsynthez Loan Extension required monthly interest payments and the repayment of the remaining principal amount in six (6) equal monthly installments from February 2022 through July 2022. All other terms of the Pharmsynthez Loan, as amended, remained in effect. All required payments under the Second Pharmsynthez Loan Extension had been made through January 31, 2022. In February 2022, the Company received a request from Pharmsynthez to further extend the principal repayments and the maturity of the loan.

The Company entered into a Third Amendment to Loan Agreement and Other Loan Documents with Pharmsynthez, Kevelt and SynBio dated October 31, 2022 (the “Third Pharmsynthez Loan Extension”) primarily to modify the repayment terms and maturity of the Pharmsynthez Loan to May 31, 2023. The terms of the Third Pharmsynthez Loan Extension require certain payments of principal, interest and fees at the signing of the Third Pharmsynthez Loan Extension. In addition, the Third Pharmsynthez Loan Extension requires the repayment of the remaining principal amount, plus interest, in seven (7) monthly installments from November 30, 2022 through May 31, 2023 as well as certain other terms and conditions. All other terms of the Pharmsynthez Loan, as amended, remained in effect. While Pharmsynthez has made certain payments in accordance with the Third Pharmsynthez Loan Extension, all principal and interest payments required to date under the Third Pharmsynthez Loan Extension have not been made to date.

SynBio LLC

In August 2011, SynBio and the Company entered into a stock subscription and collaborative development agreement (the “Co-Development Agreement”). The Company granted an exclusive license to SynBio to develop, market and commercialize certain drug candidates utilizing molecules based on SynBio’s technology and the Company’s proprietary technologies (PolyXen, OncoHist and ImuXen) in Russia and CIS, collectively referred to herein as the SynBio Market. In return, SynBio granted an exclusive license to the Company to use the preclinical and clinical data generated by SynBio in certain agreed products and to engage in the development of commercial candidates in any territory outside of the SynBio Market.

SynBio is solely responsible for funding and conducting their own research and clinical development activities. There are no milestone or other research-related payments provided for under the Co-Development Agreement other than fees for the supply of each company’s respective research supplies based on their technology, which, when provided, are due to mutual convenience and not representative of an ongoing or recurring obligation to supply research supplies. Upon successful commercialization of any resultant products, the Company is entitled to receive a 10% royalty on sales in certain territories and pay royalties to SynBio for sales outside those certain territories, subject to the terms of the Co-Development Agreement. Effective December 20, 2021, SynBio assigned the Co-Development Agreement to Pharmsynthez.

Through December 31, 2022, Pharmsynthez continued to engage in research and development activities with no resultant commercial products. In December 2020, Pharmsynthez reported positive data from its Phase 3 clinical study of Epolong, a treatment for anemia in patients with chronic kidney disease leveraging the Company’s PolyXen technology. In February 2021, Pharmsynthez reported in a press release that it had started the registration phase of Epolong by filing a registration dossier to obtain approval in Russia. Pharmsynthez had reported in its press release that it expected that the Russian stage of registration activities would be completed in 2021 and that it would be able to start production of the product as early as the first quarter of 2022. Pharmsynthez has informed the Company that it had received a response letter indicating certain deficiencies in the dossier and intends to refile the registration upon correction. The Company did not recognize revenue in connection with the Co-Development Agreement during the years ended December 31, 2022 and 2021.

Serum Institute

Serum Institute had a share ownership of less than 1% of the Company’s total outstanding common stock as of March 31, 2023. One of the Company’s directors, Firdaus Jal Dastoor, is currently a Group Director in charge of Finance and Corporate Affairs and Company Secretary of Serum Institute. In August 2011, the Company entered into a collaborative research and development agreement with Serum Institute of India Limited (“Serum Institute”) providing Serum Institute an exclusive license to use the Company’s PolyXen technology to research and develop one potential commercial product, Polysialylated Erythropoietin. Serum Institute is responsible for conducting all preclinical and clinical trials required to achieve regulatory approvals within the certain predetermined territories at Serum Institute’s own expense. Royalty payments are payable by Serum Institute to the Company for net sales to certain customers in the Serum Institute sales territory. There are no milestone or other research-related payments due under the collaborative arrangement. Through December 31, 2022, no commercial products were developed and no royalty revenue or expense was recognized by the Company related to the arrangement.

CLS Agreements

In April 2022, the Company entered into certain agreements with CLS. One of the Company's directors, Roger Kornberg, is a member of the scientific advisory board of CLS. However, Mr. Kornberg does not own any equity of CLS and is not receiving any economic benefit as a result of the transactions contemplated by such agreements. Mr. Adam Logal, one of our directors, is Senior Vice President, Chief Financial Officer, Chief Accounting Officer and Treasurer of OPKO.

Director Independence

As required under the Nasdaq Stock Market ("Nasdaq") listing standards, a majority of the members of a listed company's board of directors must qualify as "independent," as affirmatively determined by the Board of Directors. The Board consults with advisors to ensure that the Board's determinations are consistent with relevant securities and other laws and regulations regarding the definition of "independent," including those set forth in pertinent listing standards of Nasdaq, as in effect from time to time.

Consistent with these considerations, after review of all relevant identified transactions or relationships between each director, or any of his or her family members, and the Company, its senior management and its independent auditors, the Board affirmatively determined that the following directors were independent directors within the meaning of the applicable Nasdaq listing standards for the period during which they served as a member of the Board during fiscal year 2022: Dr. Callaway, Mr. Dastoor, Dr. Kornberg, Mr. Logal, Mr. Vinogradov and Dr. Borisenko.

During fiscal year 2022, all members of our Audit Committee, Nominating and Corporate Governance Committee, and Compensation Committee were independent (as independence is currently defined in Rule 5605 of the Nasdaq listing standards).

ITEM 14 – PRINCIPAL ACCOUNTING FEES AND SERVICES

The following table represents aggregate fees billed to the Company for the fiscal years ended December 31, 2022 and December 31, 2021, by Marcum LLP, the Company's principal accountant.

	2022	2021
Audit Fees	\$ 171,454	\$ 160,340
Audit-Related Fees	20,394	52,298
Tax Fees	–	–
All Other Fees	–	–
	<u>\$ 191,848</u>	<u>\$ 212,638</u>

Audit Fees

Audit fees include the total fees incurred in connection with the audit of our annual consolidated financial statements for each of the years ended December 31, 2022 and 2021.

Audit-Related Fees

Audit related fees during the year ended December 31, 2022 include fees incurred in connection with comfort letters issued in connection with our At-The-Market filing. Audit related fees during the year ended December 31, 2021 include fees incurred in connection with our S-8 and S-3 registration statements filed throughout 2021, including comfort letters and our At-The-Market filing.

Audit and Non-Audit Services Pre-Approval Policy

The Audit Committee pre-approves all audit and non-audit accounting services provided by our independent, registered accounting firm. All audit and non-audit fee services described above were pre-approved by the Audit Committee.

Pursuant to the Board of Directors' policy, to help ensure the independence of our independent registered public accounting firm, all auditing services and permitted non-audit services (including the terms thereof) to be performed for us by our independent registered public accounting firm must be pre-approved by the Audit Committee, subject to the de-minimis exceptions for non-audit services described in Section 10A(i)(1)(B) of the Exchange Act, which are approved by the Audit Committee prior to the commencement of services.

Our Audit Committee approved and retained Marcum LLP to audit our consolidated financial statements for 2022. Our Audit Committee reviewed all services provided by Marcum LLP in 2022 and concluded that the services provided were compatible with maintaining its independence.

PART IV

ITEM 15 – EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

- (a) The following financial statements, schedules and exhibits are filed as part of this report:

Consolidated Financial Statements: The consolidated financial statements and report of independent registered public accounting firm required by this item are included in Part II, Item 8 of the Original Filing;

Financial Statement Schedules: All schedules were omitted because they are not applicable or not required, or because the required information is shown in the consolidated financial statements or in the notes thereto.

- (b) **Exhibits:** The exhibits required to be filed by Item 15 are set forth in, and filed with or incorporated by reference in, the “Exhibit Index” of the Original Filing. The attached list of exhibits in the “Exhibit Index” sets forth the additional exhibits required to be filed with this Amendment and is incorporated herein by reference in response to this item.

EXHIBIT INDEX

Exhibit No.	Exhibit Index	Form	Filing Date	Exhibit Number	Filed Herewith
31.3	Certification of Principal Executive Officer, as required by Rule 13a-14(a) or Rule 15d-14(a)				X
31.4	Certification of Principal Financial Officer, as required by Rule 13a-14(a) or Rule 15d-14(a)				X

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

XENETIC BIOSCIENCES, INC.

Date: April 28, 2023

By: _____
/s/ JEFFREY F. EISENBERG
Jeffrey F. Eisenberg
Chief Executive Officer

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO EXCHANGE ACT RULES 13a-14(a) AND 15d-14(a),
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Jeffrey F. Eisenberg, certify that:

1. I have reviewed this Amendment No. 1 to the annual report on Form 10-K of Xenetic Biosciences, Inc.; and
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report.

Dated: April 28, 2023

By: /s/ Jeffrey F. Eisenberg
Jeffrey F. Eisenberg
Chief Executive Officer
(Principal Executive Officer)

**CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO EXCHANGE ACT RULES 13a-14(a) AND 15d-14(a),
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, James Parslow, certify that:

1. I have reviewed this Amendment No. 1 to the annual report on Form 10-K of Xenetic Biosciences, Inc.; and
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report.

Dated: April 28, 2023

By: /s/ James Parslow
James Parslow
Chief Financial Officer
(Principal Financial Officer and Principal Accounting Officer)