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VolitionRx Ltd (NYSE: VNRX)

VNRX: Review of 2Q 2023; Distribution Footprint of Nu.Q Vet Cancer Test is expanding. Prolific Schedule of Clinical Papers & Posters.

A discounted cash flow (DCF) model that applies a 10% discount rate and a 2% terminal growth rate indicates a price target of $4.15 per share.

Current Price (08/24/23)	$1.20
Valuation	**$4.15**

OUTLOOK

Volition's **Nu.Q Vet Cancer Test** is being launched by Supply Agreement partners in the U.S.**: IDEXX** using their 20 in-house domestic reference labs and in the second half by **Heska/Mars** on their point-of-sale platform. Heska's **$6.5 million milestone payment** from is expected during the 2H 2023.

IDEXX's international launch of the Nu.Q Vet Canine Cancer Test is anticipated in 2024.

Prolific schedule for the publication of **clinical papers** and presentations of **posters** for Nu.Q Vet Canine Cancer Test, Nu.Q NETs for sepsis and Nu.Q Cancer for lung cancer.

SUMMARY DATA

52-Week High	**$2.73**
52-Week Low	**$1.12**
One-Year Return (%)	**-23.08**
Beta	**1.62**
Average Daily Volume (shrs.)	**144,448**
Shares Outstanding (million)	**78.1**
Market Capitalization ($mil.)	**$93.8**
Short Interest Ratio (days)	**5.2**
Institutional Ownership (%)	**8.5**
Insider Ownership (%)	**7.4**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**N/M**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/M**
P/E using 2022 Estimate	**N/M**
P/E using 2023 Estimate	**N/M**

Risk Level	**Above Average**
Type of Stock	**Small-Growth**
Industry	**Med-Tech/Diagnostic**

ZACKS ESTIMATES

Revenue
(in thousands of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2020	0.5 A	5.2 A	0.6 A	7.1 A	13 A
2021	25.5 A	24.8 A	25.5 A	14.2 A	91 A
2022	114 A	40 A	33 A	120 A	306 A
2023	115 A	216 A	260 E	500 E	1,126 E

Earnings per Share)
(EPS is operating earnings before non-recurring items)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2020	-$0.14 A	-$0.12 A	-$0.09 A	-$0.11 A	-$0.45 A
2021	-$0.12 A	-$0.10 A	-$0.13 A	-$0.15 A	-$0.51 A
2022	-$0.14 A	-$0.14 A	-$0.14 A	-$0.13 A	-$0.55 A
2023	-$0.15 A	-$0.14 A	-$0.12 E	-$0.12 E	-$0.53 E

Quarterly EPS may not equal annual EPS total due to rounding.

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SECOND QUARTER HIGHLIGHTS



Nu.Q Vet

Product sales of the Nu. Q Vet Canine Cancer Screening Test grew 459% YOY and 15.0% sequentially (off a low base) driven primarily by sales of reference kits through IDEXX, which launched the test in the U.S. during January. Domestically, IDEXX has 20 affiliated reference laboratories in which to process assays, and it is anticipated that IDEXX will expand internationally to its other 60 reference labs in 2024. Heska's roll-out of the Nu.Q Canine Cancer Screening Test has been slower than expected due to Heska's desire to fully perfect the testing process on its point-of-sale platform (Element i+) prior to product's launch.

Volition's tests are transferable to multiple conventional high-volume, laboratory-based assay platforms, including ELISA (enzyme-linked immunosorbent assay) 96 well plates and bead-based chemiluminescent assays. The company is currently working on transferring the testing process to several small-sample-volume platforms, including the one using the HIA (homogeneous immunoassay) technique.

Management continues to strive toward broadening the distribution of the Nu. Q Vet Cancer Screening Test. Internationally, several prospects are being pursued with the anticipation that later in 2023 a licensing and supply agreement will be signed addressing at least one significant non-U.S. market (such as the U.K., Germany and/or another Asian country).

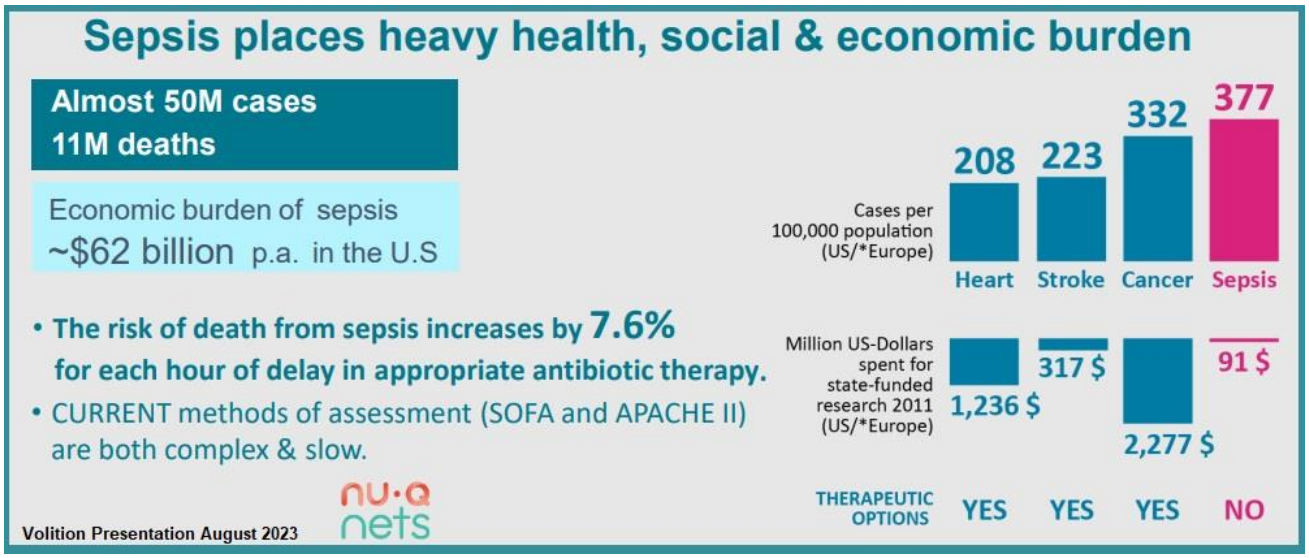
Nu.Q Vet Canine Cancer Monitoring Test: On May 10, 2023, a **peer-reviewed paper** entitled "*Monitoring plasma nucleosome concentrations to measure disease response and progression in dogs with hematopoietic malignancies*" was published in **PLOS ONE**. The paper concludes that plasma nucleosome concentrations can be a useful tool for **monitoring** the treatment of dogs with hematopoietic malignancies, particularly lymphoma**.** The open access article is available at https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0281796.

Management expects to expand the Nu.Q Vet Cancer Screening Test to a **monitoring application** through an **awareness & education campaign** starting in late 2023 and going into 2024.

Service revenues (generated by the sales of H.3 kits via Nu.Q Discover) grew 399% YOY and 837% sequentially (also off a low base).Thus far, Volition has 10 contracts signed under Nu.Q Discover, eight (8) of which are generating revenues. The company announced that **one of its oncology pharmaceutical contracts has progressed to Phase Ib,** which should generate a higher level of revenues than the pilot stage contracts in its current base.

Nu.Q NETs

According to a study published in The Lancet during 2020, globally, one in every five deaths is associated with **sepsis**.[i] In addition, according to the CDC, in a typical year, **over 350,000 adults die in the U.S. after developing sepsis** with the death occurring either during a hospital stay or subsequently after being discharged to a hospice. Volition's Nu.Q NETs test is proving to be a diagnostic aid that can help clinicians better detect the sepsis.



In June, Volition **submitted a Designation Request for Breakthrough Device with the FDA**. The process represents the first time Volition is actively interacting with the FDA. Through the Breakthrough Devices Program, the FDA will consider whether the Nu.Q NETs test meets the requirements of a breakthrough device, thereby qualifying for prioritized review on future regulatory submissions. Also, the FDA should provide guidance whether the Nu.Q NETs test is eligible for the 510(k) clearance process (aka a Premarket Notification or PMN). During a 510(k) review, the FDA does not typically evaluate clinical study data, and therefore, clearance is granted usually within three months under the 510(k) review process.

Volition works with **Centers of Excellence** where clinicians and researchers have access to Nu.Q products. In Europe, the **first clinical paper** on **Nu.Q NETs** from one Center has been submitted for peer review. Furthermore, **two (2) abstracts** from other Centers will be presented at **ESICM** (European Society of Intensive Care Medicine) **Congress LIVES** in Milan, Italy during October (see RECAP OF RECENT & SCHEDULED ABSTRACTS, PAPERS & POSTERS section below). A clinical paper was written on the results and has been accepted for publication.

During September, Volition will host a **Key Opinion Leader Roundtable Event focused on sepsis**. A physician paper is expected to be published following the event.

Nu.Q Cancer

In April 2023, Professor Léa Payen-Gay, a collaborator on validating nucleosome technology (from *Les Hospices Civils de Lyon* - the second-largest hospital in France), helped present **two (2) posters** at the **American Association of Cancer Research** (AACR) Annual Meeting in Orlando.

These 2 posters demonstrated that **Nu. Q H.3 assays**, along with molecular profiling of circulating DNA, can **improve both a diagnosis of lung cancer** and the **subsequent treatment monitoring** plan. (See RECAP OF RECENT & SCHEDULED ABSTRACTS, PAPERS & POSTERS section below).

In the latter part of October 2023, **Professor Chen** of the **National University of Taiwan** will be giving an **oral presentation** at the **European Society for Medical Oncology** (ESMO) in Madrid. Professor Chen will discuss the results of a 1,200-subject, **large-scale lung cancer study** that used Nu.Q in conjunction with low-dose CT. The study is expected to provide statistically-powered evidence of the potential utility of Nu.Q diagnostics as a screen for lung cancer or as an adjunct/triage test for low-dose CT. As a result, **the number of unnecessary biopsies could be reduced**. LDCT, currently the only recommended screening test for lung cancer, has drawbacks including its relatively high cost, patient exposure to radiation, over-diagnosis and a potential for meaningful rates of false-positives. As such, an adjunct or triage test that could improve accuracy of lung cancer screening and/or reduce the need for LDCT (without compromise to diagnosis) could have massive appeal, in our opinion.

In addition, **two** (2) **abstracts involving Nu.Q have been accepted for publication at ESMO**. One will involve Nu.Q Capture. The agenda for the ESMO Congress has not yet been posted.

Financial Highlights

On August 14, 2023, VolitionRx reported financial results for the second quarter ending June 30, 2023. Total revenues were $216,310, which was composed of $166,147 from **product revenue from** sales of the **Nu.Q Vet cancer screening &** H3.1 kits, primarily to IDEXX, and $50,163 from **services revenue from Nu.Q Discover**.

Operating expenses increased 20.0% from $8.14 million to $9.77 million as the company experienced higher clinical trial and personnel costs. **The number of full-time employees (FTE) increased** from 57 to 69 in R&D and from 19 to 21 in sales & marketing while FTE declined from 23 to 21 in G&A division. Overall, higher personnel expenses were partially offset by stock-based compensation; R&D expenses increased primarily due to **DXOCRO's regulatory efforts in the U.S.**, which added approximately $1.2 million. DXOCRO (Diagnostic Oncology CRO, LLC) is developing and will conduct large-scale clinical validation studies for Volition's Nu.Q NETs and Nu.Q Cancer tests in order to demonstrate significantly improved patient outcomes with the goal of gaining clearance, authorization or approval from the FDA.

For the second quarter, VolitionRx reported a net loss of $9.47 million attributable to stockholders (or $0.14 per diluted share) versus a net loss of approximately $7.65 million (or $0.14 per diluted share) in the comparable quarter last year.

As of June 30, 2023, **working capital was approximately $2.7 million**, a significant improvement due to the $17.45 million in net proceeds received from the equity offering that closed during the second quarter. During the first half, **shares outstanding increased by 9.1%** to 63,111,766 shares from 57,873,379 shares on December 31, 2022.

Near- and Intermediate-Term Expected Milestones

2H/2023	Heska's roll-out of Nu.Q Vet Cancer Test in the U.S.
2H/2023-2024	Roll-out of Nu.Q Canine Cancer Test for **monitoring application**
2024	IDEXX's international roll-out of Nu.Q Vet Cancer Test
2024	Nu.Q Vet Cancer Test expanding to felines

Nu. Q Vet Canine Cancer Monitoring Test

Canine Cancer Monitoring Test: On May 10, 2023, a **peer-reviewed paper** entitled "*Monitoring plasma nucleosome concentrations to measure disease response and progression in dogs with hematopoietic malignancies*" was published in **PLOS ONE** (Volume 10, article 1371). Dr. Heather Wilson-Robles et al concluded that plasma nucleosome concentrations can be a useful tool for **monitoring** the treatment of dogs with hematopoietic malignancies, particularly lymphoma**.** Elevated H3.1 nucleosome levels detected by the Nu.Q Vet Cancer Test correctly differentiated the status of the disease at a significantly higher rate than the other two biomarkers. The article is available on Volition's website at https://volition.com/media/downloads/downloads/monitoring-plasma-nucleosome-concentrations-to-measure-disease-response-and-progression-in-dogs-with-hematopoietic-malignancies/Monitoring-plasma-nucleosome-concentrations-to-measure-disease-response-and-progression-in-dogs-with-hematopoietic-malignancies.pdf

Lung Cancer

Lung Cancer: On April 4, 2023, a poster presentation entitled "*Circulating H3K27 methylated nucleosome concentration in lung cancer improves the contributive value of ctDNA molecular profiling result at diagnosis*" was presented at the **American Association of Cancer Research** (AACR) Annual Meeting in Orlando. Using Volition's chemiluminescent Nu.Q immunoassays, a study of 298 samples indicated that high levels of Nu.Q H3K27Me3 accompanied with the absence of somatic alterations "strongly support" the presence of non-mutated ctDNA, which "greatly improves the confidence" in the negative molecular results in cfDNA in Lung Cancer, which **may reduce unnecessary invasive tissue biopsies**. The poster is available on Volition's website at https://volition.com/media/downloads/downloads/circulating-h3k27-methylated-nucleosome-concentration-lung-cancer-value-ctdna-molecular-profiling-result/Circulating-H3K27-methylated-nucleosome-concentration-in-lung-cancer-improves-the-contributive-value-of-ctDNA-molecular-profiling-result-at-diagnosis.pdf

Lung Cancer: On April 4, 2023, a poster presentation entitled "*Circulating H3K27 methylated nucleosome concentration in lung cancer improves the contributive value of ctDNA molecular profiling result at diagnosis Abstract 2163: Circulating H3K27 nucleosomes to monitor lung cancer patients during treatment, a universal biomarker quantifying the molecular residual disease (MRD) in plasma samples*" was presented at the **American Association of Cancer Research** (AACR) Annual Meeting in Orlando. Using Volition's chemiluminescent Nu.Q immunoassays, a study of 300 samples indicated that high levels of Nu.Q H3K27Me3 indicated that **monitoring testing**, along with imaging, could allow physicians to better identify specific treatments. The poster is available on Volition's website at https://volition.com/media/downloads/downloads/circulating-h3k27-nucleosomes-to-monitor-lung-cancer-patients-during-treatment/Circulating-H3K27-Nucleosomes-to-monitor-Lung-Cancer-Patients-During-Treatment-a-Universal-Biomarker-Quantifying-the-Minimal-Residual-Di.pdf

Lung Cancer: On August 16, 2023, a paper entitled "*Circulating H3K27 Methylated Nucleosome Plasma Concentration: Synergistic Information with Circulating Tumor DNA Molecular Profiling*" was published in **Biomolecules** (Volume 13, article 1255). The paper out of Lyon, France, puts forth that detecting high levels of circulating tumor DNA (ctDNA) nucleosomes improves the ability to diagnose lung cancer over molecular profiling alone. In addition, high *H3K27* nucleosome levels may be a biomarker for monitoring lung cancer patients during and/or after treatment. The paper was presented at the **AACR** (American Association for Cancer Research) **2023 Annual Meeting** in Orlando, FL during April. The open access article is available at https://www.mdpi.com/2218-

273X/13/8/1255/pdf. The article is also available on Volition's website at https://volition.com/media/downloads/downloads/volition-corporate-presentation-may-2023/biomolecules-13-01255.pdf

Sepsis

Sepsis: On October 24, 2023, a paper entitled "*Therapeutic Removal of cfDNA/NETs using NucleoCapture Apheresis in a Porcine Intensive Care Sepsis Model: A blinded randomized controlled trial*" will be presented at **ESICM** (European Society of Intensive Care Medicine) **Congress LIVES** in Milan, Italy. In this blinded randomized controlled study, NucleoCapture safely and effectively removed cfDNA/NETs from the circulation of septic pigs, which resulted in improved organ function and survival.

Sepsis: On October 24, 2023, a paper entitled "*Association of Significant Elevation of NETosis and Nucleosome Biomarkers measured by Volition Nu.Q® NETs assay with Mortality in Patients with Septic Shock*" will be presented at **ESICM** (European Society of Intensive Care Medicine) **Congress LIVES** in Milan, Italy. The paper concluded that level of nucleosomes measured by Nu.Q NETs had a significantly positive correlation with organ failure and severity scores, and that the level of nucleosomes seems to be a promising biomarker upon a patient's admission.

RECENT FINANCINGS

During June 2023, VolitionRx closed a **public offering** consisting of **14,950,000 shares (**priced at $1.27 per share) that provided **approximately $17.45 million in net proceeds**. The underwritten offering was pursuant to a shelf registration statement initially filed in September 2021. The net proceeds will be used for R&D, clinical studies and product commercialization as well as for working capital purposes, including potential strategic acquisitions. Freedom Capital Markets acted as the book-running manager and Bancroft Capital acted as co-manager.

Earlier this year in February, an underwritten public offering consisting of **4,945,000 shares**, also pursuant to the same shelf registration statement, was priced at $1.75 per share. **Net proceeds were approximately $7.8 million**.

As of June 30, 2023, cash and cash equivalents totaled approximately $19.74 million versus $10.01 million at the end of the first quarter of 2023. Later this year, management expects additional expect to receive a funding from several Belgian agencies as well as $6.5 million in a milestone payment from Heska Corporation on the commercial launch of the point-of-care Nu.Q Vet screening test.

ANNUAL CAPITAL MARKETS DAY (MAY 11, 2023)

On May 11, 2023, VolitionRx conducted the company's Annual Capital Markets Day. The presentations included the **current status and prospects of Nu.Q NETs** and **Nu.Q Vet**, the two pillars of the company that are entering the commercialization phase. Volition's blood tests (assays)

Low cost (less than $100), routine (adaptable to many platforms) and accessible (multiple agreements for product distribution). One of management's utmost commercialization efforts involves **expanding the distribution channels** for the company's blood assays. During the Capital Markets Day, the company provided the **slide below showcasing the platforms** specifically targeted for processing the company's assays, along with the time required to process a blood

sample. In addition, the can be processed at regional laboratories, which require longer periods of time.



Nu.Q NETs

The **Nu.Q NETs** presentation **focused on sepsis**, a disease that accounts for over 50 million cases and over 11 million deaths worldwide. There are more cases of sepsis per 100,000 population (377 cases) in the U.S. and Europe than cancer (332), stroke (223) or heart attacks (208).

There is an **excellent presentation discussing NETs** in the Capital Markets Day webinar (between 13:34 and 18:30) that is still posted on the company's website at https://ir.volition.com/news-events/ir-calendar/detail/5213/volitionrx-limited-capital-markets-day

Early diagnosis of sepsis is key to patient outcomes and reduces long-term morbidity. Specifically, the risk of death increases 7.6% for each hour the appropriate antibiotic therapy is delayed. Current assessment tests, SOFA (Sequential Organ Failure Assessment used in Europe) and APACHE II (used in the U.S.), are complex and require time to process. It appears that V**olition's Nu.Q NETs test correlates well with the SOFA score**, according to an observational study by Morimont et al published in July 2022.[ii]

The Nu.Q NETs assay was **granted** the **CE Mark** (Conformitè Europëenne) certification process in **Europe in late May 2022**. Volition registered the Nu.Q NETs assay (H3.1 nucleosome) with a **broad claim** for detecting and monitoring diseases with a NETs component (e.g. sepsis, COVID-19, influenza, autoimmune diseases and cancer) and across multiple platforms (ELISA plate, automated beads etc.). The CE Mark enables the clinical use of the NETs assay test in more than 27 countries across Europe.

The road map to commercialization was discussed. In 2022, Volition became a **member of the International Sepsis Forum**, an important organization in the sepsis field. To date, **two clinical papers** and **six posters** have been published providing clinical evidence of the efficacy of the Nu.Q NETs assay for the detection of sepsis.

Volition is **pursuing Breakthrough Device Designation (BDD)** the U.S. The company's **Carlsbad laboratory** facility is helping spearhead the sepsis development program in the U.S. Management expects to submit a request for the BDD designation during the second quarter of 2023.

Clinical studies are underway with **Diagnostic Oncology CRO** (aka DXOCRO, a contract research organization) which specializes in the commercialization of diagnostic biomarkers. VolitionRx appointed DXOCRO to develop and conduct large-scale clinical validation studies for Nu.Q NETs in August 2022. Furthermore, DXOCRO is helping lead Volition's regulatory program in the U.S. with the goal of gaining clearance, authorization or approval from the FDA. Management believes that the mandatory FDA regulatory trials could be completed by the end of 2025.



Nu.Q Vet - Distribution



IDEXX Laboratories

In mid-October 2022**,** Volition signed a **Global Supply Agreement** for the Nu.Q Vet Cancer Test with **IDEXX Laboratories**, Inc. (NASDAQ: IDXX), a market leader in pet healthcare with 80 laboratories servicing over 50,000 veterinary practices. Through the Agreement, Volition's Nu.Q Vet Cancer Test will be offered by IDEXX as the **IDEXX Nu.Q Canine Cancer Screening Test** and the test will be processed through reference laboratories.

IDEXX Labs introduced the IDEXX Nu.Q Canine Cancer Screening Test at the Orlando Conference on January 12, 2023. **IDEXX's product launch is expected in the second half of 2023**.

Heska Corporation

On March 29, 2022, VolitionRx announced the signing of an **exclusive Global License and Supply Agreement** with Heska Corporation (NASDAQ: HSKA) for the distribution of the Nu.Q Vet Cancer Screening Test **at the point-of-care** for companion animals. Heska is a growing veterinary health laboratory diagnostic systems company specializing in point-of-care tests, analyzers and specialty products for canines and felines in North America (62.6% of revenues) and 9 international markets.

VolitionRx received a $10 million upfront payment on signing (in late-March 2022) and will receive up to an **additional $18 million based upon the achievement of certain milestones**, **namely** $6.5 million on the commercial launch of the point-of-care as a screening test, $6.5 million at the first commercial sale of a monitoring test and $5 million when the work on the feline test is finalized. The Feline test is currently in the pre-analytics stage

Initially, the licensing agreement grants exclusive rights to commercialize Nu.Q Vet for canine cancer screening and monitoring at the point of care. Heska will offer the Nu.Q Vet test on its proprietary Element i+ Immunodiagnostic Analyzer point-of-care platform, which was launched in 2020. Element i+ is designed to deliver test results in minutes

Also, Heska was granted **non-exclusive rights to sell the Nu.Q Vet test kits through its reference laboratory network**. The payment for the kits and key components will be at pre-agreed prices, which should provide another revenue stream for VolitionRx. Through Heska, **Scil Lab** launched Nu.Q Vet test kits **in Europe** during November 2022.



Mars Inc. acquired Heska in June 2023 for $1.3 billion $120.00 per share. Heska is now part of the Science & Diagnostics division of Petcare segment of Mars, a very large (annual revenues around $45 billion) privately-held company operating in over 65 countries and headquartered in McLean, Virginia. The transaction is expected to be a net positive for both Volition's Nu.Q Vet Test and Mars since the international distribution network expanded under the Global License and Supply Agreement to over 2,500 pet hospitals (including Banfield, BluePearl, Mount Pleasant and VCA).

SAGE Healthcare

In mid-December 2021**,** Volition signed a **Global Supply Agreement** for the Nu.Q Vet Cancer Test **with a market leader in pet healthcare**. In April 2022, the Nu.Q Vet test was launched in Singapore through SAGE Healthcare, which expanded the Nu.Q Vet test's geographic footprint to Asia. Through the Agreement, Volition provides its Nu.Q Vet Cancer Test through SAGE Healthcare and makes its reference laboratory network available for the screening test of the blood samples drawn by veterinarians.

DNAtech

DNAtech launched the Nu.Q Vet Cancer in **Portuga**l during late-November 2022. DNAtech has three laboratories located in the Lisbon, Porto and Algarve regions of Portugal and services over 2,300 customers.





Nu.Q Vet – Clinical Paper for Monitoring

On May 10, 2023, a **clinical paper** on utilizing nucleosome concentrations as a **tool for monitoring treatment response and remission status** of canines with hematopoietic cancers. Entitled "**Monitoring plasma nucleosome concentrations to measure of disease response and progression in dogs with hematopoietic malignancies**", the study was led by Dr. Heather Wilson-Robles, Chief Medical Officer at Volition Veterinary. The paper can be read at https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0281796

The study evaluated 40 dogs with lymphoma, acute myelogenous leukemia and multiple myeloma. The study "found that plasma nucleosome concentrations were significantly higher at diagnosis and progressive disease than they were when dogs were in remission. The study also showed that nucleosome concentrations nearly always returned to the low range during treatment and are associated with clinical remission."

As a result of this paper, the Nu.Q Vet Cancer Detection Test has a **new indication** for monitoring and now can be used as a **Nu.Q Vet Cancer Monitoring Test** for canine **lymphoma** management. Dr. Wilson-Robles recommends that the Nu.Q Vet Cancer Test be used at diagnosis, once per cycle during treatment (at least four times), at remission and every following check-up (normally every 4-to-6 weeks).

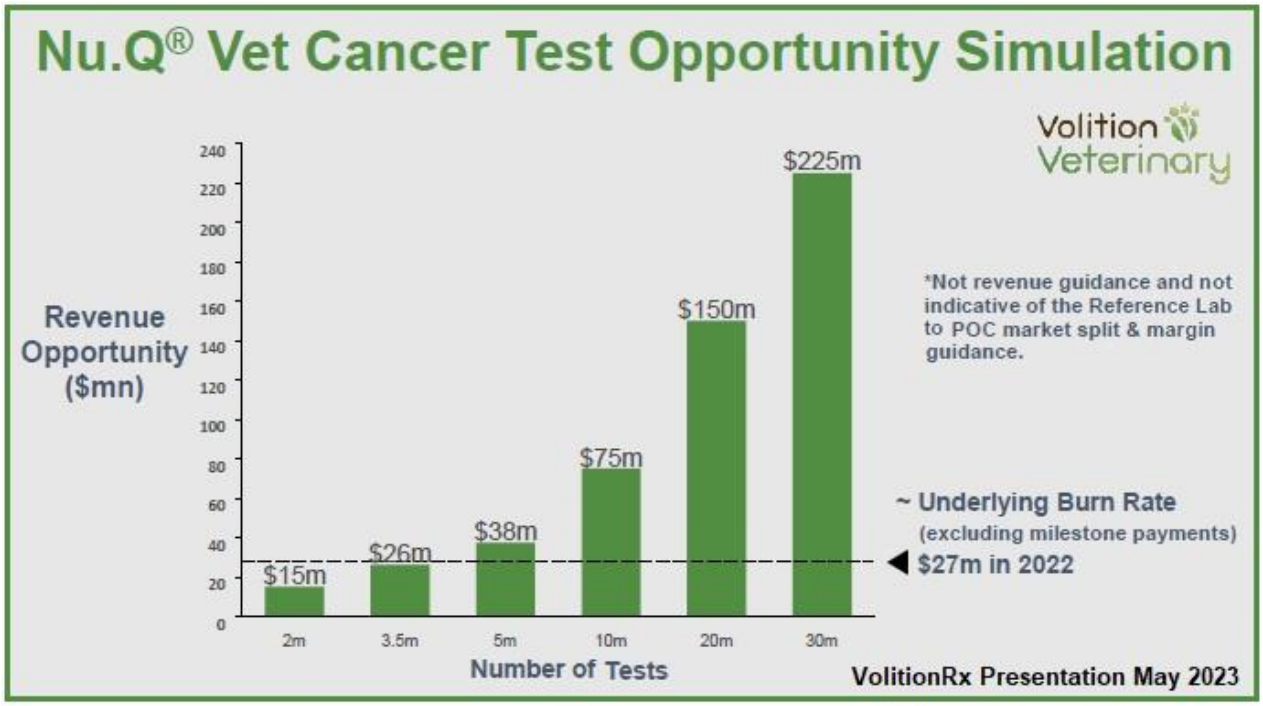


Nu.Q Vet Cancer Detection Test

Key opinion leader, Dr. Sue Ettinger, recommended that all dogs should be tested with the Nu.Q Vet Cancer Test over age of seven (7) at their **annual wellness check-up**, while **high-risk breeds** (shown in the slide below) should be tested **around the age three or four**. The test should be administered on healthy, fasted canines.



Management has presented an opportunity simulation for the Nu.Q Vet Test to illustrate the **revenue potential** at certain levels of tests being administered. Based on the simulation, between 3.7 million and 4.0 million tests annually would cover the company's level of cash burn.



IP Portfolio

VolitionRx has a substantial worldwide IP portfolio with **96 patents** and **120 patent applications pending** as of May 11, 2023.

OVERVIEW

VolitionRx is a multi-national **epigenetics company** with a focus on **developing diagnostic blood tests (assays)** that can help detect a range of cancers and other diseases so that appropriate treatment may be prescribed. Blood tests are a diagnostic tool that is relatively simple to administer, convenient and cost-effective. Also, as a front line screening modality, **blood tests would be the optimal approach for the diagnosis of life-threatening diseases** (especially cancer), where early diagnosis is the key factor for survivability.

Management's goal is to lead the foray and then dominate the epigenetics diagnostics space. The company has developed the **Nu.Q platform**, which is designed to accurately identify and measure the number of nucleosomes (and chromatin) in the bloodstream. Each Nu.Q blood assay or panel is intended to detect epigenetically-altered, circulating nucleosomes, which are biomarkers for cancer and other diseases. The company is in the process of developing and clinically testing multiple blood assays, particularly for lung, colorectal and hematological cancers.

Management's Conceptual Business Development Model

Management's **commercial strategy** involves targeting several specific markets.

- **Nu.Q Vet** – pursue full commercialization of the Nu.Q Vet blood assay for diagnosis and monitoring in the United States, Asia and Europe
- **Nu.Q NETs** – research program to bring the Nu.Q H3.1 assay to commercialization for monitoring the progression of diseases associated with NETosis, such as sepsis, COVID-19 and influenza

- **Nu.Q Capture** – advance sample enrichment platform that enhances samples using mass-spectrometry and/or sequencing in order to be able to better identify new biomarker targets for the purpose of detecting tumors and other mutations
- **Nu.Q Cancer** – ongoing human studies in hematological, lung and colorectal cancers
- **Nu.Q Discover** – helps determine levels of circulating nucleosomes and provides epigenetic profiling in disease models, pre-clinical testing and clinical trials

Management is also looking to quickly advance its market opportunities by expanding and dominating each specific market by driving aggressive volume growth through attractive pricing.

VolitionRx has undertaken the task to address a global unmet need - the scarcity of robust, low-cost screens for cancer. For example, the predominant screens for **lung cancer** are a chest x-ray and/or CT scan, both of which subject patients to radiation. If a suspected area of cancer is detected, a biopsy follows, which has the associated risks of pneumonia, blood clots, infection, adverse anesthesia complications, pleural effusion or pneumothorax (i.e. a collapsed lung, which occurs in 15% of lung biopsy patients[iii]). For **colorectal cancer**, a patient is advised to undergo a colonoscopy, which is invasive and can cause an infection, perforation (incidence of 1.96 per 1,000 procedures), bleeding and, in rare cases, death (probability of 0.01%[iv]). Therefore, many patients are reticent to undergo a colonoscopy, and some forgo the test altogether. For those who choose to avoid a colonoscopy and are later diagnosed with stage IV colorectal cancer, little more than 5% survive for five years. Conversely, those diagnosed with stage I bowel cancer (through early detection) have a five-year survival rate of 89.8%.[v] An early diagnosis of both lung and colorectal cancer dramatically improves a patient's outcome. A low-risk, low-cost, blood-based test would aid in realizing an earlier diagnosis for many patients.

R&D Center (Isnes, Belgium)

The company's **principal research & development center** is located in Isnes, **Belgium**. Opened in 2017, the **custom-designed facility** has 20,000 sq. ft. of office and R&D space, of which 10,000 square feet is devoted to the laboratory. Here, the company has the ability to conduct R&D and clinical studies in-house.

Production Facility - Silver One (Namur, Belgium)

In 2020, VolitionRx acquired a **10,000 square-foot building** (dubbed **Silver One**), which is located in Namur, Belgium in close proximity to the company's R&D center in Isnes. After refurbishing and equipping the building, the manufacturing facility opened on January 25, 2021 and by May 2021 began producing recombinant nucleosomes for in-house use for the company's Nu. Q assay product line. The new facility not only brings the manufacture of components in-house, but also will significantly reduce production costs of the company's assay products.

The building serves as a production facility for components and supply kits, a contract research facility and a service laboratory, which can provide sample processing services for third parties. In addition, management is pursuing opportunities to provide **laboratory services** or to act as a **contract research facility** (branded as **Nu.Q Discover**) for external parties, such as pharmaceutical companies, bio-tech companies and academic researchers.

VNRX Added to the Russell 3000 and Russell Microcap Indexes

VolitionRx was added to both the **Russell 3000** and **Russell Microcap Indexes** effective on the close of June 26, 2020. The Russell indexes are reconstituted annually and many mutual funds benchmark to these indices. Consequently, the **shareholder base** of VolitionRx ought to **broaden**, and the stock should experience **greater liquidity**. In addition, the inclusion of the company's stock into these two Russell indices should **expand awareness** of VolitionRx among investors, both retail and institutional.

VALUATION

Utilizing a financial model based on DCF methodology, which forecasts out to 2029, and uses a 10% discount rate (based on CAPM), a 2% terminal growth rate and a terminal P/S multiple of 0.46, the indicated value of VNRX is **$4.15 per share**.

Large Capitalization Industry Comparables	**Ticker**	**P/E Current FY**	**Mkt Cap ($billion)**	**TTM Price/ Book**	**TTM Price/ Sales**	**TTM EV/ EBITDA**
Industry Mean		**10.57**	**25.51**	**1.07**	**0.46**	**9.10**
Industry Median		11.40	16.89	1.74	0.45	8.11
ARCHER-DANIELS-MIDLAND CO	ADM	11.45	43.49	1.74	0.45	7.90
BASF SE	BASFY	11.40	44.06	1.07	0.52	15.00
BUNGE LIMITED	BG	9.70	16.89	1.60	0.27	6.06
WLMAR INTERNATIONAL LTD	WLMIY	8.45	16.37	0.85	0.24	8.44
INGREDION INC	INGR	11.85	6.73	1.97	0.83	8.11

RISKS

- VolitionRx is a clinical stage company. Since its formation, the company has incurred losses due to the continued spending on the time-consuming and costly efforts to discover and develop diagnostic products, including conducting clinical studies, obtaining regulatory clearance/approval in the United States, Asia and Europe Management expects continued losses from ongoing research and development expenses, along with administrative, manufacturing, sales and marketing expenses.

- Additional capital is required to continue funding management's strategic plan of commercializing the Nu.Q platform through the development of a suite of blood-based diagnostic tests. To date, VolitionRx has been successful in raising capital to fund the company's initiatives.

- As part of the effort to raise capital, shares outstanding have increased steadily over the last few years. Shares outstanding increased 33.2% in 2018, 16.4% in 2019, 18.2% in 2020, +10.6% in 2021 and 7.6% in 2022 as equity financings have helped fund the company's research & development costs and general corporate expenses. Thus far in 2023, shares outstanding increased 35.0%. Commercialization of the company's products is expected to mitigate the rate of shareholder dilution.

- If third parties are believed to have infringed on the company's patents, the ensuing litigation would be time-consuming and costly. Conversely, third parties might believe that their proprietary rights have been infringed, which might also result in time-consuming and costly litigation, along with potentially impinging on Volition's ability to manufacture and sell certain future products

BALANCE SHEET

VolitionRx Limited					
(in $US except share data)	2019	2020	2021	2022	2Q 2023
Period ending	12/31/2019	12/31/2020	12/31/2021	12/31/2022	6/30/2023
ASSETS					
Cash and cash equivalents	16,966,168	19,444,737	20,581,313	10,867,050	19,743,274
Accounts receivable	-	7,118	12,510	72,609	196,487
Prepaid expenses	267,518	303,178	598,367	784,920	1,024,728
Other current assets	322,593	576,660	786,642	447,566	542,639
Total Current Assets	**17,556,279**	**20,331,693**	**21,978,832**	**12,172,145**	**21,507,128**
Property, plant and equipment	2,981,225	5,171,134	4,911,077	5,393,012	5,455,395
Operating lease right-of-use assets	381,483	326,085	383,551	619,392	530,669
Intangible assets	372,305	321,641	216,876	110,505	67,722
TOTAL ASSETS	**21,291,292**	**26,150,553**	**27,490,336**	**18,295,054**	**27,560,914**
Accounts payable	627,253	1,539,547	1,542,457	3,043,008	3,492,746
Accrued liabilities	2,168,588	3,491,740	3,841,013	2,872,247	3,391,347
Deferred revenue	-	-	-	10,000,000	10,000,000
Management and directors' fees payable	21,979	55,174	71,303	71,119	72,997
Current portion of long-term debt	647,569	841,319	797,855	1,066,700	1,199,386
Current portion of financing lease liabilities	97,946	59,930	48,958	46,014	47,419
Current portion of operating lease liabilities	257,244	179,624	171,166	245,163	218,142
Warrant liability	-	-	-	-	337,989
Current portion of grant repayable	39,295	69,218	43,100	41,836	42,558
Total Current Liabilities	**3,859,874**	**6,236,552**	**6,515,852**	**17,386,087**	**18,802,584**
Long-term debt	2,195,278	2,606,885	2,270,767	2,779,240	2,452,305
Financing lease liabilities	607,708	601,967	511,086	436,132	419,804
Operating lease liabilities	131,875	151,828	217,305	400,091	340,314
Grant repayable	297,991	259,603	253,221	420,466	427,732
Non-Current Liabilities	**3,232,852**	**3,620,283**	**3,252,379**	**4,035,929**	**3,640,155**
TOTAL LIABILITIES	**7,092,726**	**9,856,835**	**9,768,231**	**21,422,016**	**22,442,739**
SHAREHOLDERS' EQUITY					
Common Stock	41,125	48,607	53,772	57,873	78,137
Additional paid-in capital	103,853,627	126,526,239	154,730,938	164,397,468	191,065,293
Accumulated other comprehensive income	125,670	(59,978)	148,326	227,097	208,331
Accumulated deficit	(89,821,856)	(110,173,971)	(136,988,636)	(167,257,429)	(185,507,956)
Total VolitionRx Stockholders' Equity	**14,198,566**	**16,340,897**	**17,944,400**	**(2,574,991)**	**5,843,805**
Non-controlling interest	-	(47,179)	(222,295)	(551,971)	(725,630)
Total Stockholders' Equity	**14,198,566**	**16,293,718**	**17,722,105**	**(3,126,962)**	**5,118,175**
TOTAL LIABILITIES & STOCKHOLDERS' EQUITY	**21,291,292**	**26,150,553**	**27,490,336**	**18,295,054**	**27,560,914**
Shares outstanding	41,125,303	48,607,017	53,772,261	57,873,379	78,136,364

PROJECTED ANNUAL INCOME STATEMENTS

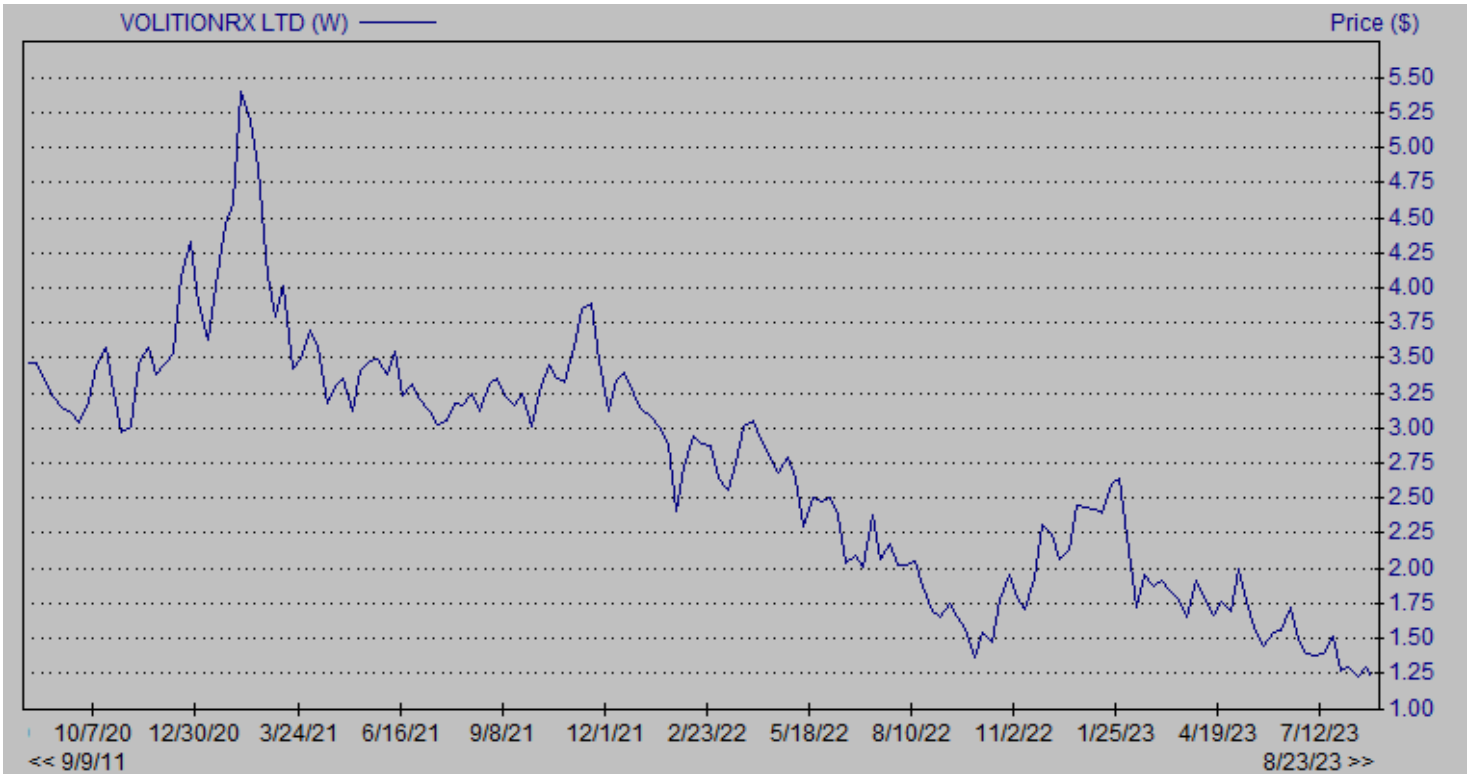
VolitionRx Limited

Income Statement (in $US, except share and per share data)	2019 12/31/2019	2020 12/31/2020	2021 12/31/2021	2022 12/31/2022	2023 E 12/31/2023
Product	-	11,321	90,035	210,993	985,599
Agreement Fee				0	0
Service (Contract lab services)	16,204	0	0	92,488	140,519
Royalty (Research kits)	892	2,112	0	2,911	0
Total Revenues	**17,096**	**13,433**	**90,035**	**306,392**	**1,126,118**
Expenses					
Research and development	10,363,253	14,533,862	15,541,889	14,572,532	21,755,061
General and administrative	4,731,054	5,654,018	8,751,392	10,937,686	10,712,573
Sales and marketing	965,713	1,073,368	4,129,833	6,576,246	6,664,857
Total Operating Expenses	**16,060,020**	**21,261,248**	**28,423,114**	**32,086,464**	**39,132,491**
Loss Before Other Income	**(16,042,924)**	**(21,247,815)**	**(28,333,079)**	**(31,780,072)**	**(38,006,373)**
Grant income	155,031	635,513	1,522,533	1,229,425	165,795
Interest income	112,367	49,495	2,734	125,265	169,757
Interest (expense)	(126,572)	(129,799)	(155,803)	(173,087)	(231,586)
Gain (loss) chg in FV of wt liab.	-	-	-	-	28,971
Gain on disposal of fixed assets	-	293,312	(26,166)	0	0
Other income (expense)	(196,957)	0	0	0	0
Total Other Income (Expenses)	**(56,131)**	**848,521**	**1,343,298**	**1,181,603**	**132,937**
Net Gain (Loss)	**(16,099,055)**	**(20,399,294)**	**(26,989,781)**	**(30,598,469)**	**(37,873,436)**
Net Gain (Loss) Non-Controlling Int.	-	(47,179)	(175,116)	(329,676)	(350,489)
Net Gain (Loss) - VNRX Stockholders	**(16,099,055)**	**(20,352,115)**	**(26,814,665)**	**(30,268,793)**	**(37,522,948)**
Basic and diluted loss per share	**(0.41)**	**(0.45)**	**(0.51)**	**(0.55)**	**(0.53)**
Wgted. Avg. Shares Out. - diluted	39,180,369	45,278,847	52,655,885	55,350,401	70,896,018

QUARTERLY INCOME STATEMENTS

VolitionRx Limited						
Income Statement (in $US except share and per share data)	**2022 12/31/2022**	**1Q 2023 3/31/2023**	**2Q 2023 6/30/2023**	**3Q E 2023 9/30/2023**	**4Q E 2023 12/31/2023**	**Estimate 2023 12/31/2023**
Product	210,993	144,452	166,147	225,000	450,000	985,599
Agreement Fee	0	0	0	0	0	0
Service (Contract lab services)	92,488	5,356	50,163	35,000	50,000	140,519
Royalty (Research kits)	2,911	0	0	0	0	0
Total Revenues	**306,392**	**149,808**	**216,310**	**260,000**	**500,000**	**1,126,118**
Expenses						
Research and development	14,572,532	4,905,678	5,451,287	5,614,826	5,783,270	21,755,061
General and administrative	10,937,686	2,581,703	2,644,957	2,709,761	2,776,152	10,712,573
Sales and marketing	6,576,246	1,707,457	1,669,102	1,652,411	1,635,887	6,664,857
Total Operating Expenses	**32,086,464**	**9,194,838**	**9,765,346**	**9,976,997**	**10,195,310**	**39,132,491**
Loss Before Other Income	**(31,780,072)**	**(9,045,030)**	**(9,549,036)**	**(9,716,997)**	**(9,695,310)**	**(38,006,373)**
Grant income	1,229,425	165,795	0	0	0	165,795
Interest income	125,265	57,648	27,109	50,000	35,000	169,757
Interest (expense)	(173,087)	(51,322)	(58,321)	(60,071)	(61,873)	(231,586)
Gain (loss) chg in FV of wt liab.	0	0	28,971	0	0	28,971
Gain (loss) disposal of fixed assets	0	0	0	0	0	0
Other income (expense)	0	0	0	0	0	0
Total Other Income (Expenses)	**1,181,603**	**172,121**	**(2,241)**	**(10,071)**	**(26,873)**	**132,937**
Net Gain (Loss)	**(30,598,469)**	**(8,872,909)**	**(9,551,277)**	**(9,727,068)**	**(9,722,182)**	**(37,873,436)**
Net Gain (Loss) Non-Controlling Int.	(329,676)	(93,361)	(80,298)	(86,830)	(90,000)	(350,489)
Net Gain (Loss) - VNRX Stockholders	**(30,268,793)**	**(8,779,548)**	**(9,470,979)**	**(9,640,238)**	**(9,632,182)**	**(37,522,948)**
Basic and diluted loss per share	**(0.55)**	**(0.15)**	**(0.14)**	**(0.12)**	**(0.12)**	**(0.53)**
Wgted. Avg. Shares Out. - diluted	55,350,401	60,176,975	66,884,368	78,136,364	78,386,364	70,896,018

HISTORICAL STOCK PRICE



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