



NEXSEN



Building A Life Saving Rapid Diagnostics Platform Using Cutting Edge Aptamer Bio-Markers

NEXSEN Limited
Saving Lives | Making a Difference

OPPORTUNITY



BUILDING THE TECHNOLOGY PLATFORM TO ADDRESS GLOBAL NEED FOR RAPID POINT OF CARE DIAGNOSTICS (LAB ON A STICK)

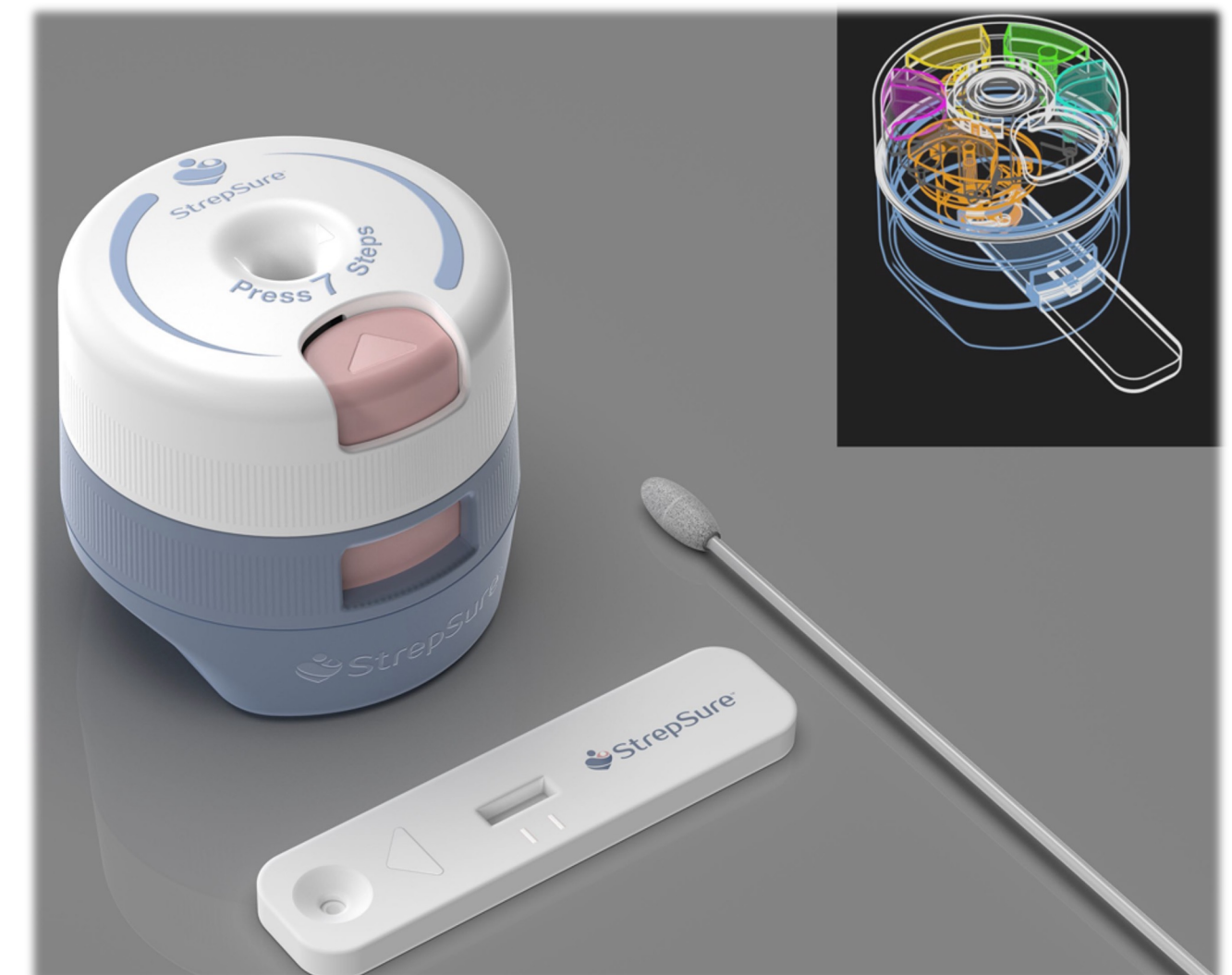
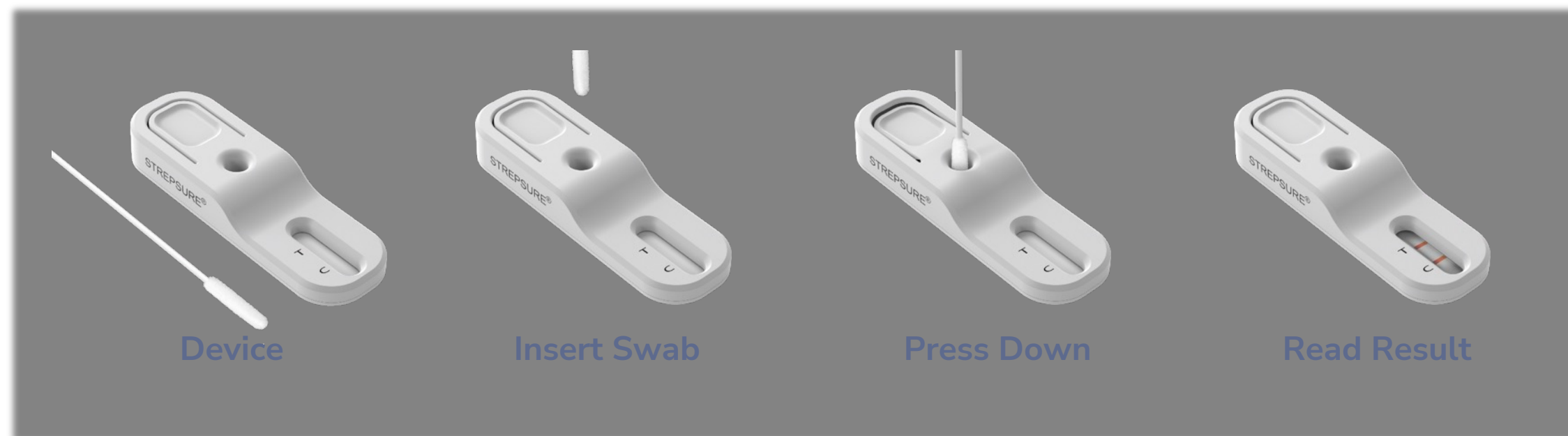
Global Forecast to 2029, is projected to reach USD 119.4 billion by 2029 from USD 85.2 billion in 2024, at a CAGR of 6.9% during the forecast period. Growth in the IVD market is mainly driven by the growing awareness of early disease diagnosis, emergence of rapid point of care technologies, and rising adoption of automated analysers.

Building rapid point of care diagnostic solutions for clinical, retail and at home testing both in developed and developing countries



Non-pathology based rapid Point-of-Care Test gives the ability to test up to and including labour.

This means that multiple, inexpensive tests can be conducted in clinics, hospitals and at home, with results expected within 15 to 20 minutes.

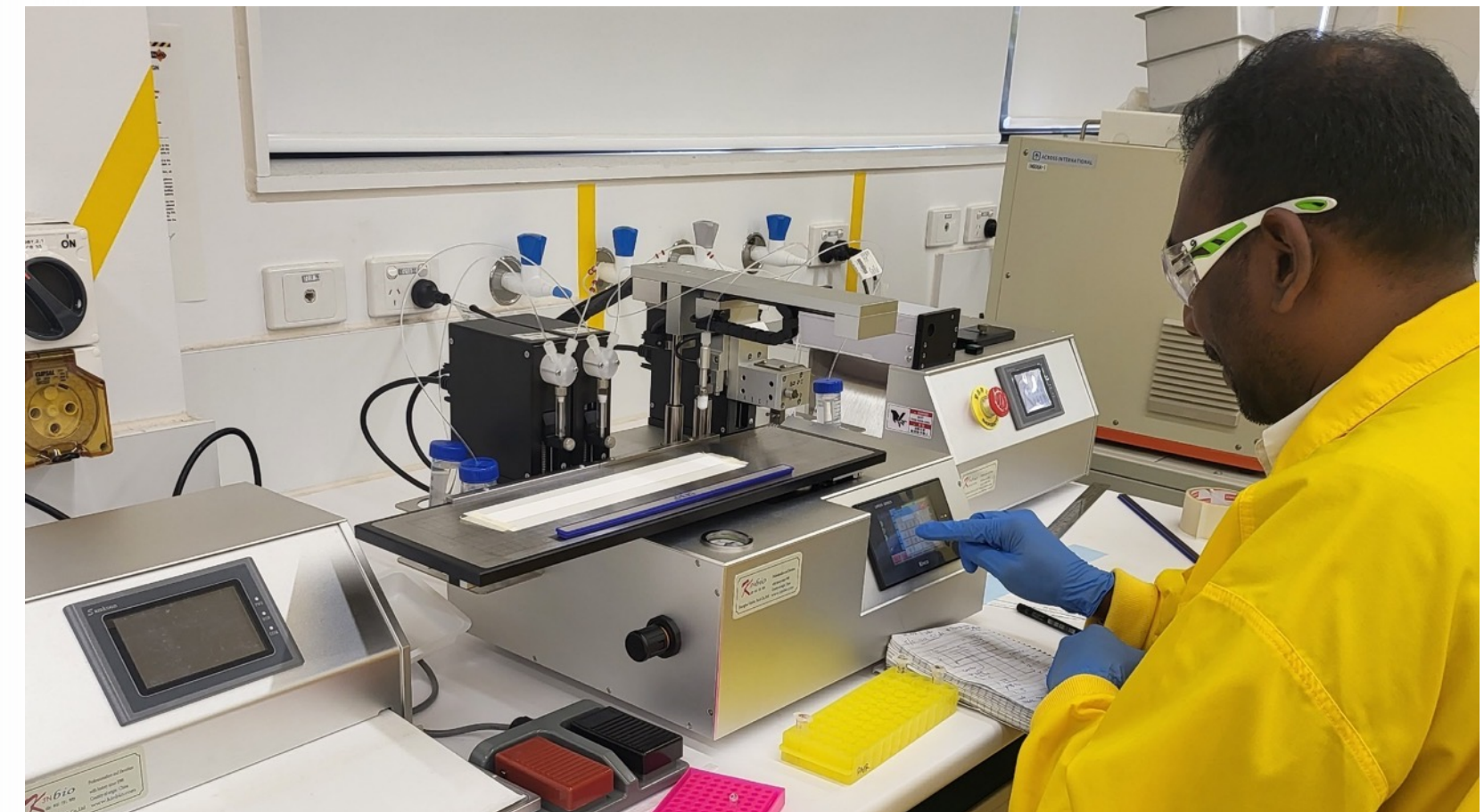
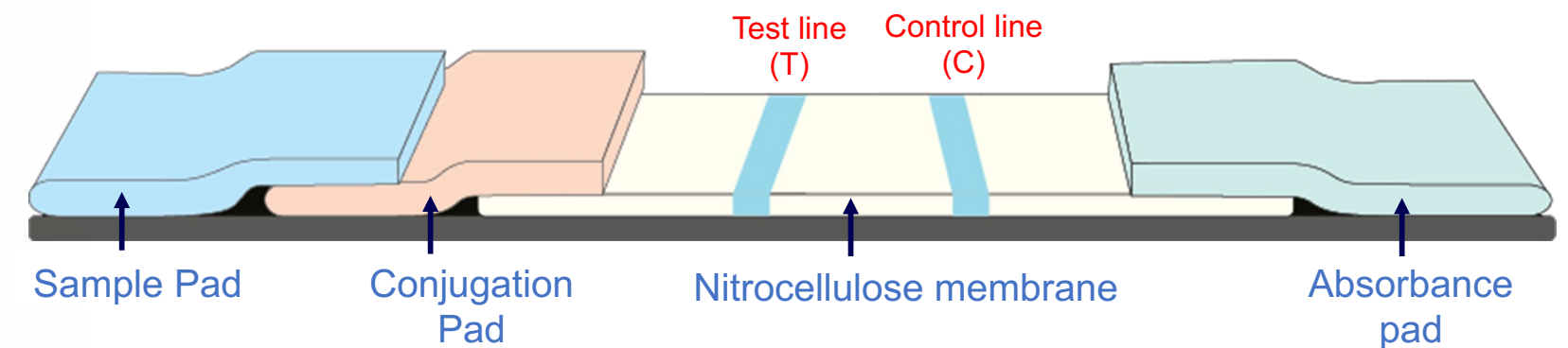


THE TECHNOLOGY

DEVELOPING A CAPABILITY TO BUILD A NEW STANDARD FOR POINT OF CARE DIAGNOSTIC TESTS

- NEXSEN has developed a **world first rapid diagnostic point-of-care device called *StrepSure*[®]**.
- Ground-breaking **biomarker discovery, bioconjugation chemistry, and nanoparticle engineering**, represents a significant step forward in diagnostic testing.
- Core to this innovation are the application of advanced biomarkers including **aptamers, a synthetic DNA molecule that binds selectively to identified particles with extreme sensitivity**.
- In addition to our groundbreaking *StrepSure*[®] Test, NEXSEN and RMIT are developing other tests for **rapid point of care kidney function and cancer diagnosis**.

COMPONENTS OF THE LATERAL FLOW ASSAY (LFA) STRIP



ACHIEVEMENTS TO DATE



A DIAGNOSTIC COMPANY ADDRESSING A CRITICAL UNMET
NEED FOR A RAPID GROUP B *STREPTOCOCCUS* TEST

- Mar-22 • Signed commercialisation and research agreement with RMIT
- Nov-23 • Lab testing completed
- Dec-23 • Discovery made. Filing of provisional patent on new aptamers.
 - Awarded an Australian Commonwealth Government Grant to fund A\$7.7m project
 - Clinical trial partner approved (Northern Health)
 - New design and device technology partner identified (Design + Industry)
- Feb-24 • Awarded Industry Growth Program Advisory Service leading to further funding
- Mar-24 • First design for new lateral flow device
- Jun-24 • Agreement to acquire all background IP
- Jul-24 • Successful application to the ARC for Industrial Transformation Research Hub for Molecular Biosensors at Point of Use (MOBIUS) \$A1.75m project
- Aug-24 • Received R&D Grant rebate for additional Australian Government Funding
- Aug-24 • Northern Health identifies new clinical market opportunity increasing by 4 times the market size potential
- Sep-24 • gbsaware.com portal launched
- Sep-24 • nexsen.ai platform scoped for rapid discovery and optimisation of biomarkers.
- Mar-25 • Ethics approval submitted and expected to be completed by May 2025



PARTNERS



NEXSEN HAS DELIVERED SIGNIFICANT VALUE ACCRETIVE TRANSACTIONS AND RESEARCH PROGRAMS TO DATE



RMIT UNIVERSITY

contributed approximately ~\$5M into the first research program across 5 years



Research Agreement with RMIT UNIVERSITY executed in connection with the **Sir Ian Potter Nano BioSensing Facility** with 100% of the commercialisation rights provided to NEXSEN



Australian Government
Department of Industry, Science,
Energy and Resources

AusIndustry
Cooperative Research
Centres Program

Recipient of **Australian Commonwealth Grant** to fund.

- A\$3m cash from the Australian Commonwealth Government
- A\$1.35m in kind to be provided by RMIT University
- A\$2.35m cash and in kind to be provided by NEXSEN
- A\$1.0m cash and in kind to be provided by other collaboration partners
- Clinical trials performed by Northern Health Victoria

Northern Health

Clinical Trials Agreement with **Northern Health** to conduct 3,000+ clinical samples for comparative trial program. **Northern Health** cares for over 97,000 patients each year and assists with the delivery of over 3,300 babies.



Design + Industry to provide the lateral flow device design and new device technology



Australian Government
Australian Research Council



LA TROBE
UNIVERSITY

Australian Government funding awarded for **A\$1.75m project** for diagnostic tests in animal and veterinary applications

OVERVIEW – TEST ONE GBS

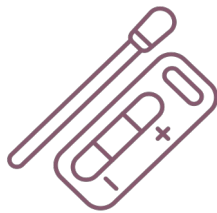


A DIAGNOSTIC COMPANY ADDRESSING A CRITICAL UNMET
NEED FOR A RAPID GROUP B *STREPTOCOCCUS* TEST



GLOBAL PROBLEM

Many countries do not routinely test for GBS, a highly prevalent and potentially fatal disease, due to the costs involved or availability of medical testing facilities.



POINT-OF-CARE TEST

A rapid, low-cost and easy-to-use point-of-care test enabling easy and accessible testing with the opportunity for multiple tests.



RAPID LIFE SAVING TEST

If caught early because of the speedy and accurate results, GBS is easily and inexpensively treatable with antibiotics.



SIGNIFICANT ADDRESSABLE MARKET

Product can be used during professional consultations, at home, for health agencies and NGO's.



SUBSTANTIAL COST SAVINGS

Reduce staff, medical and risk costs associated with standard pathological testing.

“Fighting chance against one of the leading causes of death and disability for newborns”

AND

“The fact this technology also offers the potential to free up tens of millions of dollars within our healthcare system to help other Australians in need is just cherry on the cake”

The Hon. Ed Husic, Minister for Industry and Science



Australian Government
**Department of Industry,
Science and Resources**

“This technique would be a game changer”

AND

"That's really really important because it's going to help a lot of families going forward and reduce the stress on the health system"

Associate Professor Prahlad Ho,
Chair of Northern Health Research Executive Committee

Northern Health

A GLOBAL PROBLEM



GROUP B STREPTOCOCCUS BACTERIA AND ITS TRANSMISSION TO NEWBORNS

134M

Births per year globally

21.7M

Pregnant women carry the GBS bacteria

518k

potentially linked excess pre-term births each year



2. Our World in Data, Births and Deaths per year (Oxford University)
3. <https://www.rcog.org.uk/for-the-public/browse-our-patient-information/group-b-streptococcus-gbs-in-pregnancy-and-newborn-babies/#:~:text=GBS%20is%20a%20common%20bacterium,around%20the%20time%20of%20birth>
4. <https://www.cdc.gov/groupbstrep/about/fast-facts.html#:~:text=In%20the%20United%20States%2C%20GBS,who%20develop%20GBS%20disease%20die>
5. Streptococcus agalactiae in childbearing age immigrant women in Comunitat Valenciana, 2020
6. Disease burden due to GBS in the Indian population (Chia & Rambhad) 2021
7. Stillbirths and neonatal death, AIHW 2023

BOVINE MASTITIS TEST – TEST 2



THE DAIRY SECTOR REPRESENTS A SIGNIFICANT OPPORTUNITY TO ADDRESS BOVINE MASTITIS



A\$1.75m Funding won by NEXSEN

NEXSEN's wholly owned subsidiary Nexgen NanoSensors has won a prestigious ARC grant and has become a founding member of the Industrial Transformation Research Hub for Molecular Biosensors at Point-of-Use (MOBIUS), led by La Trobe University. The total funding will allow for the development of VetStrep and other diagnostic sensors in animal health.



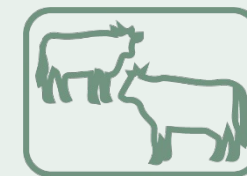
Australian Government
Australian Research Council



Specialist and Veterinary Practices

Significant advantages for veterinarians to test more regularly, and at a lower cost to the monitoring and testing practices currently undertaken.

Targeting veterinary clinics and state-run organisations regulating the health and welfare of the dairy herds as well as population health and food safety.



Direct to Farm Consumer

Provides individual dairy farmers, or large dairy foods conglomerates with the ability to take control of the health and testing of their own herds in a more orderly and prescriptive way.

Sales to target both the government and private sectors that retail products to the dairy industry.



- Current cost to the global dairy industry is estimated at **US\$17bn – \$28bn per annum**
- Global population of dairy cows is estimated at **271 million**
- The bovine diagnostics market size is currently expected to reach **US\$2bn by 2030** (up from US\$1.1bn in 2022)
- Bovine mastitis rates are typically estimated as between **30% – 50%** of all dairy herds annually
- Economic losses are calculated at **US\$133 per animal per year**
- CAGR of **7.2%** is estimated from 2022 to 2030

EXECUTION ROADMAP

A PATHWAY TO ADVANCING INFANT AND WOMEN'S HEALTHCARE AND EARLY GBS DETECTION

- Q4 2024
- Complete Series B Round of Funding
 - **Patent and IP transfer to NEXSEN**
 - **Final Prototype** developed
 - **Bovine Prototype**
 - **Commercial Licensing Agreement**
 - Submission and filing of **Global Patent**
 - Early results on new tests for PSA and Creatinine
 - Completion of **Clinical Trials**
 - Completion of **Animal Trials**
 - **FDA & TGA Approval Outcome**
 - Begin Development of new Diagnostic Tests
 - Submit application for **Other Jurisdictions**
 - **Commercialisation** StrepSure® and VetStrep®
- Q4 2026
- UK Approval Outcome

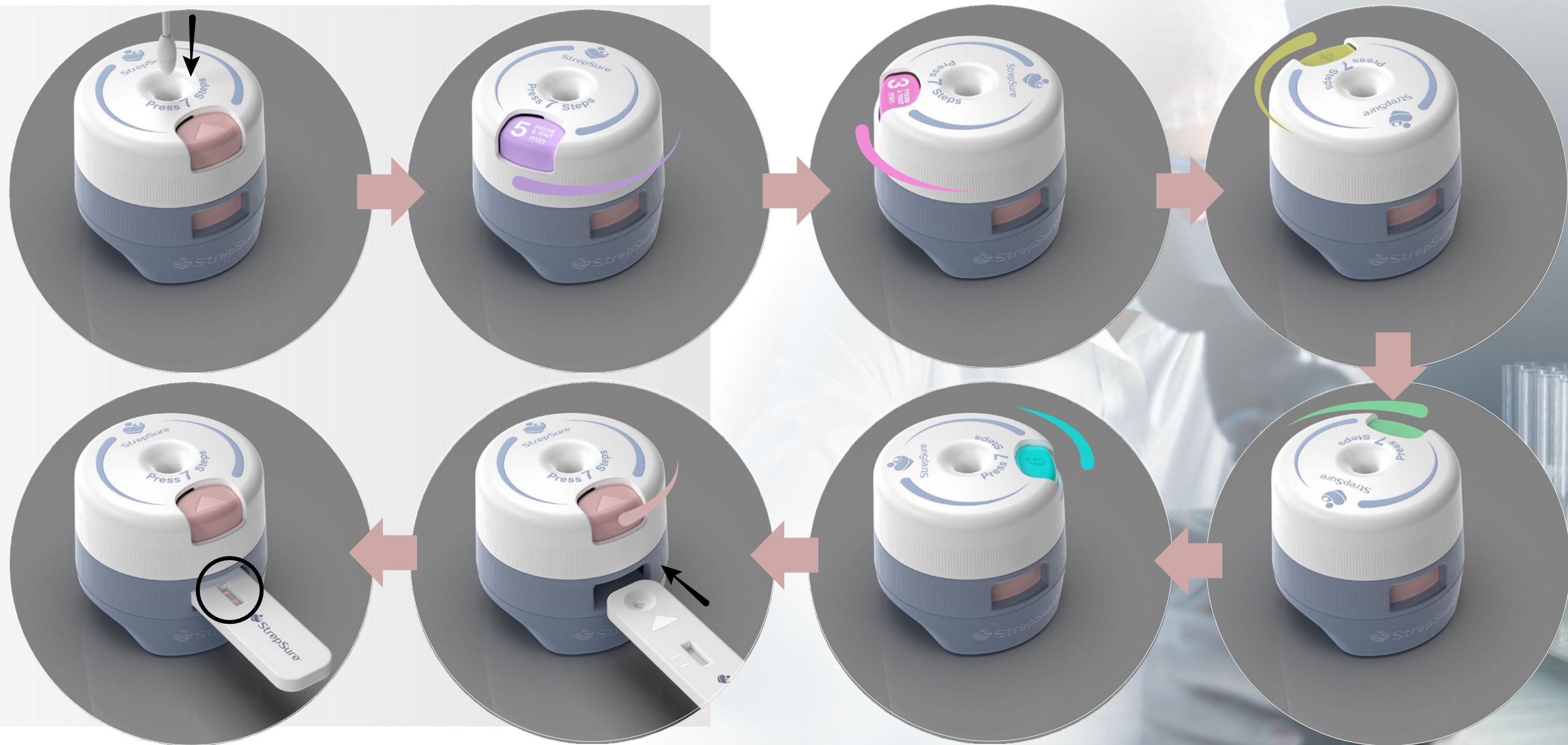
The StrepSure logo, featuring a stylized icon of a person and a red dot, followed by the text 'StrepSure®' in a bold, sans-serif font.The VetStrep logo, featuring a stylized icon of a paw print and a green dot, followed by the text 'VetStrep®' in a bold, sans-serif font.

CHANGING DIAGNOSTICS

SAVING LIVES ONE PERSON AT A TIME WITH OUR
GROUNDBREAKING “LAB ON A STICK”

Building rapid point of care diagnostic tests provides patients, clinicians, and governments with better health outcomes **with cost effective screening systems** that can be distributed by agencies and purchased in retail outlets.

This is not a collection system that will send samples to a lab, this is the basis for **Lab on a Stick**. Providing pathology lab quality tests in a rapid point of care model.



FUTURE TESTS

A RAPID POINT OF CARE AND AT HOME KIDNEY FUNCTION TEST

***Creatinine** is a waste product in the blood that comes from the breakdown of muscle tissue and the digestion of protein in food. Kidneys filter creatinine from the blood and pass it into urine to be removed from the body. Creatinine levels are measured to evaluate kidney function and monitor kidney disease treatment.*

*Why a Point of Care **Creatinine** Test is Needed:*

- *Convenience and Accessibility*
- *Early Detection and Monitoring*
- *Reduced Healthcare Costs*
- *Better Disease Management*
- *Global **Creatinine** Test Market: Valued at USD 1.042 billion in 2023, projected to reach USD 3.36 billion by 2032 (CAGR: 13.66%). And At-Home Testing Segment: Expected significant growth, with the albumin & **creatinine** tests market forecasted to grow from \$987 million (2020) to \$2,103 million (2025) (CAGR: 16.3%).*

*There are currently no FDA or TGA approved at home point of care tests for **creatinine** levels, with almost all testing done in a lab.*

*NEXEN anticipates a rapid point of care **Creatinine** test to be ready for clinical trials within 24 months.*



A RAPID POINT OF CARE AND AT HOME PSA TEST

*A prostate-specific antigen (**PSA**) test measures the amount of prostate-specific antigen in your blood. **PSA** is a protein produced by the prostate gland, which is part of the male reproductive system. It's present in the blood. A **PSA** test is used to screen for prostate cancer, detect small tumours, and monitor men after prostate cancer treatment. Doctors typically recommend starting **PSA** screening at age 55, but many men avoid getting tested due to aversion.*

*In 2022, the **PSA** test market was valued at approximately USD 3.9 billion and is projected to reach around USD 8.8 billion by 2032, growing at a compound annual growth rate (CAGR) of 8.3% during the forecast period. The integration of rapid **PSA** tests into the POC diagnostics market is anticipated to enhance early detection and monitoring of **prostate** health, offering benefits such as convenience, timely results, and the potential for improved patient outcomes.*

*The FDA has approved a rapid **PSA** test, the Sangia Fingerstick Point-of-Care **PSA** Test. **The test is suitable for use in a physician's office laboratory, but not for an at home, retail, or mass market screening.***

*NEXSEN anticipates a rapid point of care **PSA** test to be ready for clinical trials within 30 months.*

OTHER PROJECTS - NEXSEN.AI



USING ARTIFICIAL INTELLIGENCE TO IDENTIFY AND OPTIMISE APTAMER SELECTION

AI will revolutionise the process of aptamer selection and characterisation.

This makes initial research more efficient and less labour intensive, and dramatically reduces development time when compared to the time taken in the discovery of the GBS based aptamer biomarkers. NEXSEN is developing an AI platform to assist with the future discovery of new aptamers for a variety of bacteria, viruses, cancers and other pathologies.

Aptamers are short string DNA, RNA, or Synthetic Molecules with high target affinity. The advantages of biomarkers include low production cost, easy modification, high thermal stability and low levels of immunogenicity and toxicity.

The current Selex aptamer screening practice is time consuming and labour intensive. By integrating NEXSEN AI to streamline aptamer selection the advantages include:

- **Structure Based Methods** predicting aptamer target binding through secondary/tertiary structure, molecular docking and dynamic simulations
- **Machine/Deep Learning** merging models showing promise in predicting binding abilities as AI will be offering more efficiency, accuracy and will reduce development time significantly.

LEADERSHIP TEAM

MANAGEMENT WITH A TRACK RECORD OF SUCCESSFUL
TECHNOLOGY COMMERCIALISATION



Mark Muzzin
Chairman
mm@nexsen.bio

Mark has had more than 30 years of commercial experience working with both Australian and international public and private companies. He served as the Managing Director/CEO of an ASX listed entity from 2008 to 2016. Since 2009, Mark has been working with various academic institutions to commercialise IP, primarily in 2D materials and in biosensors. He is also an industry liaison for the Australia Research Council (ARC) Centre of Excellence in Future Low-Energy Electronics Technologies.



Thomas Hanly
Managing Director
th@nexsen.bio

Thomas has a strong understanding of capital markets and a passionate interest in technology. He was previously Managing Director and CEO of the ASX listed Singular Health Group and has held a number of board positions of companies in Australia and Singapore. His experience with the funding and commercialisation of innovative technologies has recently seen him involved with several ground-breaking projects.



Gavin Ball
Non-Executive Director
gb@nexsen.bio

Gavin is a business manager who adds strength to each of the companies with whom he works. He has over 30-years of hands-on skill and intellectual expertise in the start-up, commercial development, growth and ongoing management of businesses, and has proven management, financial and accounting skill sets, with a strong sales and marketing focus. Gavin has both current and past experience as a Commercial Manager and Company Director.



Dr Martina Mariano
Non-Executive Director
martina@nexsen.bio

Martina brings a unique ability to seamlessly integrate innovation, scientific rigour, and business acumen to accelerate the commercialisation of cutting-edge medical technologies. Martina holds a PhD in Medicine (Perth, UWA), is a graduate of the Australian Institute of Company Directors (AICD) and has served as a Forensic Geneticist for the Italian Carabinieri Police Force, Medical Scientist, and as Chief Commercial Officer at the ASX-listed company Singular Health Group".

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