ZeptoMetrix®

USA FDA Registration Number 3000202849

IVD CE 2797 UKCA

NATtrol™ SA Positive Control
Part Number: NATMSSA-6MC-IVD

INTENDED USE:

The NATtrol™ *Staphylococcus aureus* (SA) Positive Control is an unassayed *in vitro* diagnostic external run control intended to be used with qualitative molecular assays for detection of nucleic acids from this organism. The control is intended to be used as an aid to diagnosis in that it is used to verify performance of the assays used to detect a physiological or pathological state. The routine and repetitive use of external run controls enables laboratories to monitor daily test variation, lot-to-lot test kit performance, individual operator variation, and can provide assistance in identifying increases in random or systemic errors. NATtrol™ SA Positive Control contains intact organisms and should be run in a manner identical to that used for clinical specimens. This qualitative control is not automated and does not have an assigned value and it is the responsibility of the end user to establish their own target specifications for the control using their laboratory's molecular procedures.

PRODUCT SUMMARY AND EXPLANATION:

NATtrol™ SA Positive Control is formulated with purified, intact SA bacterium that have been chemically modified to render them non-infectious and refrigerator stable*.

Each NATtrol™ SA Positive Control contains 6 x 0.5 mL vials of NATtrol™ SA formulated in a Purified Protein Matrix.

*Pat.: http://www.zeptometrix.com/patent-information/

PRINCIPLE:

NATtrol™ SA Positive Control contains *Staphylococcus aureus* cells inactivated by ZeptoMetrix's patented NATtrol™ process formulated in a proprietary purified protein matrix that mimics the composition of a true clinical specimen. These are full process controls designed to monitor the effectiveness of extraction, amplification, and detection in nucleic acid testing procedures. These controls are suitable for use in in-house molecular assays and commercially available platforms.

WARNINGS AND PRECAUTIONS:

Although NATtrol™ SA Positive Control contains inactivated microorganisms, handling and disposal should be conducted as if materials are potentially infectious.

This control contains material of human and animal origin and the user should observe Universal Precautions when handling and disposing of this product. Disposal must follow local regulations, if more stringent than regulations enforced by the CDC or the FDA.

Do not pipette by mouth.

To avoid cross-contamination, use separate transfer pipettes or tips for all materials.

Do not use beyond the expiration date shown on the label.

Usage beyond the expiration date shown on the label or after storage outside the recommended temperature may be detrimental to product performance or stability and lead to invalid or erroneous results.

If product is received damaged or leaking, contact ZeptoMetrix for instructions.

Changes in physical appearance of the product such as excessive turbidity, presence of precipitates, or discoloration may indicate degradation or contamination of the product. Discard the vial.

Failure to follow the assay or kit manufacturer's instructions explicitly for testing and analysis of results may lead to invalid or erroneous results.

If the expected result is not obtained, contact ZeptoMetrix for instructions.

NOT FOR USE IN HUMANS:

These products are NOT intended for use in the manufacture or processing of injectable products subject to licensure under section 351 of the Public Health Service Act or for any other product intended for administration to humans.

RECOMMENDED STORAGE:

NATtrol™ SA Positive Control should be stored at 2-8°C upon arrival.

When stored as directed, controls are suitable for use for up to 56 days (8 weeks) once opened.

INSTRUCTIONS FOR USE:

Vortex NATtrol™ SA Positive Control vials for 10 seconds to mix.

Follow the manufacturer instructions for use as a clinical sample.

Any serious incident that has occurred in relation to the device shall be reported to ZeptoMetrix and the competent authority of the Member State in which the user and/or the patient is established.

LIMITATIONS:

NATtrol™ SA Positive Controls are USA FDA Class 1 exempt, unassayed, external run controls intended for *in vitro* diagnostic use and are for professional use only.

NATtrol™ SA Positive Controls are not intended for use as a substitute for the internal controls provided by *in vitro* diagnostic kit manufacturers.

NATtrol™ SA Positive Control is not intended for use as a primary reference standard or material for any assay or testing procedure.

Quality control materials should be used in accordance with local, state, federal and accreditation requirements.

EXPECTED RESULTS:

Qualitative results are shown in Table 1 below. This is provided for informational purposes only.

As stated in the intended use, this product does not have an assigned value. Each laboratory must evaluate each lot of controls and establish acceptance criteria with their own specific molecular assay procedure and according to their own established quality assurance requirements and guidelines.

Product homogeneity has been demonstrated by validation studies and quality control testing.

Table 1:

Part Number	Organism/ Strain	Expected Results
NATMSSA-6MC-IVD	*Staphylococcus aureus* (MSSA; C1960)	MRSA - not detected SA - detected

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Analytical Performance Characteristics:

Precision testing was performed in replicates of four per the final release assay in the QC SOP. Precision testing was performed on five different days for each of the three lots resulting in testing over 15 days. The testing was performed by four different technicians on two different instruments. The acceptance criteria for precision testing is a 25-30 Ct result for *Staphylococcal* protein A (SPA) from each run, a 0 (Negative) for Methicillin resistance (mec) and *Staphylococcal* cassette chromosome mec (SCC), and a %CV of ≤5%.

Intra-assay repeatability was measured by comparing the results of each day of testing for all three lots (Table 2). Inter-assay reproducibility was measured by analyzing the results of testing of each lot across the five different days (Table 3), each technician (Table 4), and each instrument (Table 5).

Accuracy/Assay System Comparison testing was conducted on Multiple Platforms, (Table 6). The final release QC testing data was generated on Cepheid® GeneXpert® using the Xpert® MRSA/SA Blood Culture Assay. Additional assays were performed on the BioFire® FilmArray® BCID Panel. The data from testing on each platform was analyzed. The acceptance criteria for all accuracy testing were a result of *Staphylococcus aureus* detected and methicillin resistance not detected for each lot on both assay systems/platforms.

For all data analyses, all acceptance criteria were met. *Staphylococcus aureus* was detected, and the %CV values were ≤5%. The control produces repeatable and reproducible results which are independent of the operator and instrument. Accuracy data was detected for *Staphylococcus aureus* and not detected for methicillin resistance at a 100% detection rate. The control produces accurate results when tested using two different assay systems/platforms.

Table 2 – Intra-Assay Repeatability

Lot	Day	SPA Mean (Ct)	SPA Std Dev (Ct)	SPA %CV	mec Mean (Ct)	mec Std Dev (Ct)	mec %CV	SCC Mean (Ct)	SCC Std Dev (Ct)	SCC %CV
Validation Lot 2	2	28.1	0.2	0.9%	0.0	0.0	0.0%	0.0	0.0	0.0%
	3	27.6	0.7	2.5%	0.0	0.0	0.0%	0.0	0.0	0.0%
	4	27.8	0.8	2.8%	0.0	0.0	0.0%	0.0	0.0	0.0%
	5	28.6	0.6	2.2%	0.0	0.0	0.0%	0.0	0.0	0.0%
Validation Lot 3	1	27.4	0.3	1.0%	0.0	0.0	0.0%	0.0	0.0	0.0%
	2	27.5	0.3	1.0%	0.0	0.0	0.0%	0.0	0.0	0.0%
	3	27.4	0.3	1.0%	0.0	0.0	0.0%	0.0	0.0	0.0%
	4	27.6	0.2	0.6%	0.0	0.0	0.0%	0.0	0.0	0.0%
	5	27.6	0.4	1.4%	0.0	0.0	0.0%	0.0	0.0	0.0%
Validation Lot 4	1	27.5	0.9	3.2%	0.0	0.0	0.0%	0.0	0.0	0.0%
	2	28.3	0.4	1.3%	0.0	0.0	0.0%	0.0	0.0	0.0%
	3	27.9	0.2	0.9%	0.0	0.0	0.0%	0.0	0.0	0.0%
	4	27.1	0.5	1.7%	0.0	0.0	0.0%	0.0	0.0	0.0%
	5	27.8	0.6	2.1%	0.0	0.0	0.0%	0.0	0.0	0.0%

Table 3 - Inter-Assay Precision - By Lot

Lot	Member	SPA Mean (Ct)	SPA Std Dev (Ct)	SPA %CV	mec Mean (Ct)	mec Std Dev (Ct)	mec %CV	SCC Mean (Ct)	SCC Std Dev (Ct)	SCC %CV
Validation Lot 2	NATtrol™ SA Positive Control	28.0	0.7	2.4%	0.0	0.0	0.0%	0.0	0.0	0.0%
Validation Lot 3	NATtrol™ SA Positive Control	27.5	0.3	1.0%	0.0	0.0	0.0%	0.0	0.0	0.0%
Validation Lot 4	NATtrol™ SA Positive Control	27.7	0.6	2.3%	0.0	0.0	0.0%	0.0	0.0	0.0%

Table 4 - Inter-Assay Precision - By User

User (number of tests)	Instrument	SPA Mean (Ct)	SPA Std Dev (Ct)	SPA %CV	mec Mean (Ct)	mec Std Dev (Ct)	mec %CV	SCC Mean (Ct)	SCC Std Dev (Ct)	SCC %CV
MR (n=16)	Inst. 2(x4), Inst 1(x12)	28.0	0.7	2.4%	0.0	0.0	0.0%	0.0	0.0	0.0%
BC (n=20)	Inst. 1	27.5	0.3	1.1%	0.0	0.0	0.0%	0.0	0.0	0.0%
EL (n=12)	Inst. 1	27.9	0.6	2.2%	0.0	0.0	0.0%	0.0	0.0	0.0%
DB (n=8)	Inst. 1	27.5	0.6	2.2%	0.0	0.0	0.0%	0.0	0.0	0.0%

Table 5 - Inter-Assay Precision - By Instrument

Instrument	Number of tests	SPA Mean (Ct)	SPA Std Dev (Ct)	SPA %CV	mec Mean (Ct)	mec Std Dev (Ct)	mec %CV	SCC Mean (Ct)	SCC Std Dev (Ct)	SCC %CV
Inst. 1	n=52	27.7	0.5	1.8%	0.0	0.0	0.0%	0.0	0.0	0.0%
Inst. 2	n=4	28.6	0.6	2.4%	0.0	0.0	0.0%	0.0	0.0	0.0%

Table 6 - Accuracy/Assay System Comparison

Validation Lot	Assay System/Platform 1 (Final Release n=4)		Assay System/Platform 2 (n=1)	
	SPA Results	mec and SCC Results	*Staphylococcus aureus* Results	mecA Results
Lot 2	Detected, 100%	Not Detected, 100%	Detected	Not Detected
Lot 3	Detected, 100%	Not Detected, 100%	Detected	Not Detected
Lot 4	Detected, 100%	Not Detected, 100%	Detected	Not Detected

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ETIOLOGIC STATUS/BIOHAZARD TESTING:

NATtrol™ inactivation was completed on the stocks used to formulate each control and further verified by the absence of bacterial growth in a validated growth protocol.

The Purified Protein Matrix used in the manufacture of this product is treated with 0.09% sodium azide. It was manufactured from materials that have been tested and found non-reactive at the donor level for HIV-1/HIV-2 Antibody, HBsAg and HCV Antibody by FDA licensed donor screening test methods. All materials are also tested for HIV-1 and HCV by FDA approved Nucleic Acid Test (NAT) methods. Heat inactivated bovine based source materials used in the manufacture of this product meet applicable USDA requirements for abattoir sourced animals, traceability and country of origin. The materials were collected at USDA licensed establishments or legally imported from countries recognized by the USDA as negligible or controlled for risk for Bovine Spongiform Encephalopathy (BSE) and other exotic disease agents. Donor animals were inspected ante and post mortem at the abattoir as required by the USDA.

PRODUCT WARRANTY:

ZeptoMetrix LLC's limited product warranty and other terms and conditions related to the purchase and use of ZeptoMetrix products are set forth in ZeptoMetrix's Terms and Conditions of sale found on ZeptoMetrix's website at Sales Terms and Conditions. If you have any questions, please contact ZeptoMetrix Customer Service at **diagnostic.cs@zeptometrix.com**.

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LEGEND OF LABELING SYMBOLS:

	Manufacturer		**Temperature Limitation**
IVD	***In vitro* Diagnostic Use**		**Use-By Date**
CE	**European Mark of Conformity**		**Biological Risk**
REF	**Catalogue Number**	EC REP	**Authorized Representative**
LOT	**Batch Code**		**Consult Instructions for Use**
BIO	**Contains biological material of animal origin**	BIO	**Contains biological material of human origin**
UDI	**Unique Device Identifier**	UK CA	**UKCA Mark of Conformity**

Manufacturer
ZeptoMetrix LLC
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Franklin, MA 02038, USA

EC Representative:
EC REP
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UK Responsible Person:
Emergo Consulting (UK) Limited
c/o Cr360 – UL International,
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REVISION HISTORY.

Revision Level	Description of Revisions
07	Added additional statement to warning concerning usage beyond the expiration date shown on the label or after storage outside the recommended temperature, changes in physical appearance of the product, failure to follow the assay or kit manufacturer's instructions explicitly, and if the expected result is not obtained action. Added "NATtrol™ SA Positive Control is not intended for use as a primary reference standard or material for any assay or testing procedure." to Limitations. Added "Any serious incident that has occurred in relation to the device shall be reported to ZeptoMetrix and the competent authority of the Member State in which the user and/or the patient is established." to Instructions for Use. Added verbiage to Intended Use to indicate it is a qualitative control that is not automated. The fundamental Intended Use has not changed. Added Revision History section. Changes in response to BSI Technical File review for IVDR compliance. Added biological and UDI symbols. Updated EC Representative Emergo Europe address to new location. Added UK Responsible Person contact details.
08	Adding UKCA Mark of Conformity.
09	Updated Customer Service email. Added analytical performance characteristics per DC-23-005.
10	Adding CE2797 Mark of Conformity per DC-24-004.