

**510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
DEVICE ONLY TEMPLATE**

A. 510(k) Number:

K032279

B. Analyte:

Amikacin

C. Type of Test:

Quantitative/ Immunoturbidimetric

D. Applicant:

ROCHE DIAGNOSTICS CORP.

E. Proprietary and Established Names:

ONLINE TDM AMIKACIN

F. Regulatory Information:

1. Regulation section:
21CFR §862.3035 -Amikacin test system.
2. Classification:
2
3. Product Code:
KLP
4. Panel:
Toxicology (91)

G. Intended Use:

1. Indication(s) for use:
The ONLINE TDM Amikacin Assay is for the quantitative determination of amikacin in human serum or plasma on automated clinical chemistry analyzers.
2. Special condition for use statement(s):
3. Special instrument Requirements:
Roche Hitachi 911, 912, 917 and Modular P analyzers

H. Device Description:

The assay is a homogeneous immunoassay based on the principle of measuring changes in scattered light or absorbance which result when activated microparticles aggregate. This amikacin assay test procedure is intended to be automated, for use on Roche Hitachi line of analyzers. The calibrators and controls for this assay, Roche Cobas-FP amikacin Calibrators (K852317) and Cobas-FP TDM Multianlyte Controls (K981532), will be sold separately.

I. Substantial Equivalence Information:

1. Predicate device name(s):
Roche Cobas Integra Amikacin Assay
2. Predicate K number(s):
K991597
3. Comparison with predicate:
The fundamental test principle employed differs in the two assays. The ONLINE TDM amikacin uses a homogeneous microparticles agglutination immunoassay. In contrast the Roche COBAS INTEGRA amikacin assay utilizes a fluorescence polarization immunoassay (FPIA) system.

J. Standard/Guidance Document Referenced (if applicable):

NCCLS – EP5 T2 Precision

K. Test Principle:

The assay is a homogeneous immunoassay based on the principle of measuring changes in scattered light or absorbance which result when activated microparticles aggregate. The microparticles are coated with amikacin and rapidly aggregate in the presence of an amikacin antibody solution. When a sample containing amikacin is introduced, the aggregation reaction is partially inhibited, slowing the rate of the aggregation process. Antibody bound to sample drug is no longer available to promote microparticles aggregation, and subsequent particle lattice formation is inhibited. Thus, a classic inhibition curve rate of aggregation at the lowest amikacin concentration. By monitoring the change in scattered light or absorbance, a concentration dependent curve is obtained.

L. Performance Characteristics (if/when applicable):

1. Analytical performance:

- a. *Precision/Reproducibility:*

| | | | |
|--------------|-----------|-----------|-----------|
| Within Run | Control 1 | Control 2 | Control 3 |
| Mean (ug/ml) | 5.43 | 16.88 | 33.27 |
| SD | 0.10 | 0.23 | 0.47 |
| CV% | 1.7 | 1.4 | 1.4 |
| Total | | | |
| Mean (ug/ml) | 5.43 | 16.88 | 33.27 |
| SD | 0.15 | 0.37 | 0.68 |
| CV% | 2.8 | 2.2 | 2.0 |

- b. *Linearity/assay reportable range:*
0.54 – 40.0 ug/ml – 11 – level dilutions series was prepared using a amikacin spiked human serum pool diluted with a nonspiked serum pool. Results were evaluated by linear regression.
 - c. *Traceability (controls, calibrators, or method):*
Previously cleared products
 - d. *Detection limit:*

0.54 ug/ml - determined by the lowest concentration distinguished from zero. Calculated as two standard deviations above the 0 ug/ml calibrator (within run precision, n=21).

e. Analytical specificity:

Criterion: recovery +/- 10% of initial value at concentrations 5.0 ug/ml and 19 ug/ml

Icterus: No significant interference from bilirubin up to an approximate conjugated and unconjugated bilirubin concentration: 65 mg/dl.

Hemolysis: No significant interference from hemoglobin up to approximate hemoglobin concentration: 1000 mg/dl. Lipemia: No significant interference from lipemia (Intralipid) up to an L index of 2000. There is poor correlation between the L index (corresponds to turbidity) and triglycerides concentration.

No significant interference from triglycerides up to 1212 mg/dl.

Rheumatoid factors: No significant interference from rheumatoid factors up to 817 IU/ml

Total protein: No significant interference from 0.1 g/dl to 12.3 g/dl protein.

The following compounds were tested for cross-reactivity

| Compound | Concentration Tested (ug/ml) | Cross- reactivity |
|------------------|---|------------------------------|
| Amphotericin | 20 | ND |
| Ampicillin | 90 | ND |
| Carbenicillin | 500 | ND |
| Cephalexin | 500 | ND |
| Cephalosporin C | 500 | ND |
| Cephalothin | 60 | ND |
| Chloramphenicol | 300 | ND |
| Clindamycin | 5 | ND |
| Erythromycin | 200 | ND |
| Ethacrynic acid | 500 | ND |
| 5-Fluorocytosine | 700 | ND |
| Furosemide | 100 | ND |
| Fusidic acid | 500 | ND |
| Gentamicin | 100 | ND |
| Kanamycin A | 25 | ND |
| Kanamycin B | 25 | ND |
| Lincomycin | 30 | ND |
| Methotrexate | 23 | ND |
| Methylprednisol | 500 | ND |
| Neomycin | 100 | ND |
| Netilmicin | 80 | ND |

| Compound | Concentration Tested (ug/ml) | Cross-reactivity |
|--------------------|------------------------------|------------------|
| Oxytetracycline | 40 | ND |
| Penicillin V | 50 | ND |
| Prednisolone | 500 | ND |
| Rifampin | 320 | ND |
| Spectinomycin | 200 | ND |
| Streptomycin | 200 | ND |
| Sulfadiazine | 1500 | ND |
| Sulfamethoxazol | 2000 | N D |
| Tetracycline | 40 | N D |
| Tobramycin | 100 | ND |
| Trimethoprim | 120 | N D |
| Vancomycin | 400 | ND |
| ND= not Detectable | | |

Tests were performed on 13 drugs. No significant interference was found

| | |
|-----------------|----------------|
| Acetaminophen | Ibuprofen |
| Acetyl cysteine | Levodopa |
| Acetylsalicylic | Methyldopa+1,5 |
| Ascorbic acid | Metronidazole |
| K-Dobesilate | Phenylbutazone |
| Cefoxitin | Theophylline |
| Cyclosporine | |

f. Assay cut-off:

See Detection limit above.

2. Comparison studies:

a. *Method comparison with predicate device:*

Linear Regression to predicate:

N=89, Range = 0.4 – 39.9 ug/ml

$Y=0.869x + 0.159$

$r=0.976$

b. *Matrix comparison:*

Acceptable comparison studies for plasma matrix (potassium EDTA and sodium or lithium heparin). Acceptance criteria = slope of 0.91-1.10, intercept of ± 1.66 and $r^2 \geq 0.95$

3. Clinical studies:

a. *Clinical sensitivity:*

Not Applicable

b. *Clinical specificity:*

Not Applicable

4. Clinical cut-off:
Not Applicable
5. Expected values/Reference range:
Peak 20 – 25 ug/ml
Trough 5 – 10 ug/ml
Toxicity at Peak > 35 ug/ml
Toxicity at Trough > 10 ug/ml
From literature

M. Conclusion:

The information and data provided by ROCHE DIAGNOSTICS CORP. supports a Substantial Equivalence (SE) determination to other AMIKACIN SERUM ASSAY regulated under 21 CFR §862.3035 - Amikacin test system.