# 510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
# DECISION SUMMARY
ASSAY AND INSTRUMENT

## I Background Information:

### A 510(k) Number

K233606

### B Applicant

Biokit S.A.

### C Proprietary and Established Names

ADVIA Centaur EBV-VCA IgM

### D Regulatory Information

| Product Code(s) | Classification | Regulation Section | Panel |
|---|---|---|---|
| LSE | Class I, reserved | 21 CFR 866.3235 - Epstein-Barr Virus Serological Reagents | MI - Microbiology |

## II Submission/Device Overview:

### A Purpose for Submission:
To obtain clearance of a new device.

### B Measurand:
IgM antibodies to the viral capsid antigen (VCA) of Epstein Barr virus (EBV).

### C Type of Test:
Fully automated qualitative chemiluminescent immunoassay.

## III Intended Use/Indications for Use:

### A Intended Use(s):

The ADVIA Centaur EBV-VCA IgM (EBVM) assay is for in vitro diagnostic use in the qualitative detection of IgM antibodies to the viral capsid antigen (VCA) of the Epstein-Barr virus (EBV) in human pediatric (2-21 years old) and adult serum and plasma (EDTA and lithium heparin) using the ADVIA Centaur XP system. When used in conjunction with other EBV markers, this assay is intended for use as an aid in the diagnosis of Epstein-Barr virus infection, such as infectious mononucleosis.

**B Indication(s) for Use:**

Not applicable

**C Special Conditions for Use Statement(s):**

Rx - For Prescription Use Only

**D Special Instrument Requirements**

The assay is intended for use on the fully automated ADVIA Centaur XP manufactured by Siemens Healthcare Diagnostics Inc.

## IV Device/System Characteristics:

**A Device Description:**

The ADVIA Centaur EBV-VCA IgM (EBVM) is a qualitative, serological, two-step sandwich chemiluminescent immunoassay performed on the fully automated ADVIA Centaur XP system intended for use in conjunction with other EBV markers as an aid in the diagnosis of Epstein-Barr virus infection, such as infectious mononucleosis.

The ADVIA Centaur EBVM assay kit consists of the ReadyPack primary reagent pack containing Lite Reagent, Solid Phase, and Ancillary Well Reagent, The ReadyPack ancillary reagent pack containing Ancillary Reagent (diluent), and low and high calibrators. External positive and negative controls are required to perform the assay and are available separately.

**B Principle of Operation:**

The ADVIA Centaur EBV-VCA IgM assay is a fully automated two-step sandwich immunoassay using acridinium ester chemiluminescent technology. The specimen is incubated with the Ancillary Well Reagent and the Solid Phase, which contains an EBV-VCA IgM specific antigen, Viral Capsid Antigen (VCA) p18 (biotinylated peptide) coated onto streptavidin magnetic microparticles. Antigen-antibody complexes will form if anti EBV-VCA IgM antibody is present in the specimen. The Lite Reagent contains monoclonal anti-human IgM labeled with acridinium ester and is used to detect EBV-VCA IgM in the specimen.

Index values for samples are determined automatically by software as ratio of the sample relative light units (RLU) to the cutoff RLU and reported in Index Values and as Nonreactive or Reactive:

- Nonreactive: < 1.00 Index. These samples are considered negative.
- Reactive: ≥ 1.00 Index. These samples are considered positive.

**C Instrument Description Information:**

1. Instrument Name:

   ADVIA Centaur XP

2. Specimen Identification:

Serum, EDTA plasma, and lithium heparin plasma are the validated specimen types for the ADVIA Centaur EBV-VCA IgM assay.

3. Specimen Sampling and Handling:

Samples in the primary collection device (serum stored on the clot, plasma stored on packed red cells, and samples processed and stored in gel-barrier blood collection tubes) are stable for up to 7 days at 2 - 8°C. Separated samples are stable for up to 4 hours at room temperature, up to 7 days at 2 - 8°C, and up to one month at ≤ -20ºC with no more than one freeze/thaw cycle. The assay requires 20 µL of sample for a single determination. The instrument performs all handling procedures automatically.

4. Calibration:

The ADVIA Centaur EBVM assay kit includes two calibrators (high and low). Calibration is performed as follows:

- At the end of the 28-day calibration interval.
- When changing lot numbers of primary reagent packs.
- When indicated by quality control results.
- After major maintenance or service, as indicated by quality control results

Before initiating calibration on each new lot of reagent, the assay master curve values need to be entered by scanning the master curve card.

5. Quality Control:

External positive and negative controls are available separately. The controls should be used at least once during each day that samples are analyzed. In addition, quality control is performed:

- Following a valid calibration
- With use of a new lot of reagent
- When troubleshooting test results that do not match clinical conditions or symptoms

Acceptable performance is achieved when the analyte values obtained are within the expected control interval for the system.

## V Substantial Equivalence Information:

### A Predicate Device Name(s):
Diasorin Liaison EBV IgM Assay

### B Predicate 510(k) Number(s):
K040120

## C Comparison with Predicate(s):

| Device & Predicate Device(s): | K233606 | K040120 |
|---|---|---|
| Device Trade Name | ADVIA Centaur EBV-VCA IgM | LIAISON EBV IgM |
| Intended Use | The ADVIA Centaur EBV-VCA IgM (EBVM) assay is for in vitro diagnostic use in the qualitative detection of IgM antibodies to the viral capsid antigen (VCA) of the Epstein-Barr virus (EBV) in human pediatric (2-21 years old) and adult serum and plasma (EDTA and lithium heparin) using the ADVIA Centaur XP system. When used in conjunction with other EBV markers, this assay is intended for use as an aid in the diagnosis of Epstein-Barr virus infection, such as infectious mononucleosis. | The LIAISON EBV IgM assay uses chemiluminescent immunoassay (CLIA) technology on the LIAISON Analyzer family for the qualitative determination of specific IgM antibodies to Epstein-Barr virus (EBV) viral capsid antigen (VCA) p18 synthetic peptide in human serum. When performed in conjunction with other EBV markers, this assay can be used as an aid in the clinical laboratory diagnosis of Epstein-Barr Viral Syndrome in patients with signs and symptoms of EBV infection such as infectious mononucleosis. |
| **General Device Characteristic Similarities** | | |
| Measurand | Same | IgM antibodies to the viral capsid antigen (VCA) of Epstein Barr virus (EBV). |
| Technology | Same | Chemiluminescent immunoassay (CLIA) |
| Antigen | Same | p18 |
| **General Device Characteristic Differences** | | |
| Sample Type | Human serum and plasma (EDTA and lithium heparin) | Human serum |
| Target Population | Adults and pediatrics | Adults |
| | As an aid in the diagnosis of Epstein-Barr virus infection, such as infectious mononucleosis | As an aid in the clinical laboratory diagnosis of Epstein-Barr Viral Syndrome in patients with signs and symptoms of EBV infection such as infectious mononucleosis |

## VI Standards/Guidance Documents Referenced:

- CLSI EP05-A3 Evaluation of Precision of Quantitative Measurement Procedures; Approved Guideline - Third Edition (Reaffirmed: September 2019).
- CLSI EP09c Measurement Procedure Comparison and Bias Estimation Using Patient Samples - 3rd Edition (2018).
- CLSI EP07 lnterference Testing in Clinical Chemistry; Approved Guideline - 3rd Edition (2018).
- CLSI EP37 Supplemental Tables for Interference Testing in Clinical Chemistry - 1st Edition (2018).
- CLSI EP25-A (Replaces EP25-P) Evaluation of Stability of In Vitro Diagnostic Reagents; Approved Guideline (2009).
- CLSI EP12-A2 User Protocol For Evaluation of Qualitative Test Performance; Approved Guideline - 2nd Edition (2008).
- CLSI I/LA21-A2 Clinical Evaluation of Immunoassays; Approved Guideline - 2nd Edition.

## VII Performance Characteristics (if/when applicable):

### A Analytical Performance:

1. Precision/Reproducibility:

1) Precision study was performed using three lots of the ADVIA Centaur EBV-VCA IgM with two runs per day for 20 days measuring duplicates of each external control and ten contrived samples with levels of analyte ranging from negative to high positive. The within laboratory precision study results for one representative reagent lot are shown in **Table 1**.

**Table 1.** Precision study results. SD: standard deviation of mean value (Index); %CV: coefficient of variation.

| Sample ID | Mean Value (Index) | N | Repeatability | | Between-Run | | Between-Day | | Between-Lot | | Total Precision | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SD | %CV | SD | %CV | SD | %CV | SD | %CV | SD | %CV |
| Control 1 | 0.28 | 240 | 0.012 | N/A | 0.014 | N/A | 0.010 | N/A | 0.011 | N/A | 0.024 | N/A |
| Control 2 | 3.02 | 240 | 0.071 | 2.3% | 0.049 | 1.6% | 0.088 | 2.9% | 0.214 | 7.1% | 0.247 | 8.2% |
| Serum A | 0.75 | 240 | 0.019 | 2.5% | 0.018 | 2.4% | 0.017 | 2.3% | 0.081 | 10.9% | 0.087 | 11.6% |
| Serum B | 0.96 | 240 | 0.024 | 2.5% | 0.023 | 2.4% | 0.023 | 2.4% | 0.076 | 8.0% | 0.086 | 9.0% |
| Serum C | 1.39 | 240 | 0.034 | 2.4% | 0.030 | 2.2% | 0.041 | 2.9% | 0.119 | 8.5% | 0.133 | 9.6% |
| Serum D | 3.16 | 240 | 0.075 | 2.4% | 0.053 | 1.7% | 0.101 | 3.2% | 0.173 | 5.5% | 0.221 | 7.0% |
| Serum E | 7.22 | 240 | 0.217 | 3.0% | 0.140 | 1.9% | 0.269 | 3.7% | 0.531 | 7.4% | 0.649 | 9.0% |
| Plasma, EDTA A | 0.74 | 240 | 0.019 | 2.6% | 0.026 | 3.4% | 0.023 | 3.0% | 0.048 | 6.4% | 0.062 | 8.3% |
| Plasma, EDTA B | 1.00 | 240 | 0.022 | 2.2% | 0.031 | 3.1% | 0.027 | 2.7% | 0.061 | 6.1% | 0.077 | 7.7% |
| Plasma, EDTA C | 1.40 | 240 | 0.029 | 2.1% | 0.045 | 3.2% | 0.041 | 2.9% | 0.118 | 8.4% | 0.136 | 9.7% |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Plasma, EDTA D | 3.35 | 240 | 0.081 | 2.4% | 0.062 | 1.8% | 0.111 | 3.3% | 0.308 | 9.2% | 0.342 | 10.2% |
| Plasma, EDTA E | 7.63 | 240 | 0.218 | 2.9% | 0.367 | 4.8% | 0.320 | 4.2% | 0.466 | 6.1% | 0.709 | 9.3% |

2) Reproducibility of the ADVIA Centaur EBV-VCA IgM assay was assessed at three external testing sites using one reagent lot and three ADVIA Centaur XP instruments (one per testing site) evaluating external controls and eight samples with levels of analyte ranging from high negative to positive over five days with two runs per day and triplicate measurements. Study results are presented in **Table 2**.

**Table 2.** Reproducibility study results.

| | | Within-Run Repeatability | | Between-Run | | Between-Day | | Between-Site | | Reproducibility | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample** | **Mean (Index)** | **SD** | **%CV** | **SD** | **%CV** | **SD** | **%CV** | **SD** | **%CV** | **SD** | **CV (%)** |
| Serum A | 0.85 | 0.023 | 2.7% | 0.028 | 3.3% | 0.004 | 0.5% | 0.017 | 2.0% | 0.040 | 4.7% |
| Serum B | 1.00 | 0.024 | 2.4% | 0.020 | 2.1% | 0.008 | 0.8% | 0.011 | 1.1% | 0.034 | 3.5% |
| Serum C | 1.57 | 0.038 | 2.4% | 0.022 | 1.4% | 0.014 | 0.9% | 0.028 | 1.8% | 0.054 | 3.4% |
| Serum D | 3.30 | 0.099 | 3.0% | 0.025 | 0.8% | 0.009 | 0.3% | 0.081 | 2.5% | 0.131 | 4.0% |
| Plasma EDTA A | 0.75 | 0.023 | 3.0% | 0.026 | 3.4% | 0.000 | 0.0% | 0.013 | 1.8% | 0.037 | 4.9% |
| Plasma EDTA B | 1.00 | 0.035 | 3.5% | 0.023 | 2.3% | 0.000 | 0.0% | 0.009 | 0.9% | 0.043 | 4.3% |
| Plasma EDTA C | 1.49 | 0.036 | 2.4% | 0.038 | 2.5% | 0.000 | 0.0% | 0.016 | 1.1% | 0.055 | 3.7% |
| Plasma EDTA D | 3.72 | 0.103 | 2.8% | 0.088 | 2.4% | 0.054 | 1.4% | 0.106 | 2.8% | 0.180 | 4.9% |
| Control 1 | 0.24 | 0.012 | N/A | 0.004 | N/A | 0.006 | N/A | 0.009 | N/A | 0.017 | N/A |
| Control 2 | 3.20 | 0.248 | 7.8% | 0.000 | 0.0% | 0.075 | 2.3% | 0.145 | 4.5% | 0.297 | 9.3% |

2. Linearity

Not Applicable

3. Analytical Specificity/Interference:

1) Cross-reactivity

Biokit evaluated the influence of potentially cross-reacting antibodies to infections other than EBV (as well as autoimmune disorders) on the ADVIA Centaur EBV-VCA IgM. A total of 353 samples confirmed to be EBV IgM-negative on a comparative assay and positive for antibodies for 32 different diseases/conditions were tested in singlicate with the candidate device on ADVIA Centaur XP system. The study results are presented in **Table 3**.

**Table 3.** Results of cross-reactivity study.

| Clinical Category | Number Tested | Candidate Device Results | | Comparative Assay Results | | |
|---|---|---|---|---|---|---|
| | | - | + | - | Equivocal | + |
| Cytomegalovirus (CMV) IgG | 10 | 10 | 0 | 10 | 0 | 0 |
| Cytomegalovirus (CMV) IgM | 10 | 7 | 3 | 7 | 0 | 3 |
| Parvovirus B19 IgM | 10 | 10 | 0 | 9 | 0 | 1 |
| *Toxoplasma gondii* IgG | 10 | 10 | 0 | 10 | 0 | 0 |
| *Toxoplasma gondii* IgM | 28 | 22 | 6 | 24 | 0 | 4 |
| Rubella IgG | 20 | 18 | 2 | 19 | 1 | 0 |
| Rubella IgM | 11 | 11 | 0 | 10 | 1 | 0 |
| Hepatitis B Virus (HBV) IgM | 11 | 11 | 0 | 11 | 0 | 0 |
| Hepatitis A Virus (HAV) IgM | 10 | 7 | 3 | 8 | 0 | 2 |
| Hepatitis C Virus (HCV) | 11 | 11 | 0 | 10 | 0 | 1 |
| Human Immunodeficiency Virus (HIV) | 10 | 9 | 1 | 9 | 0 | 1 |
| Herpes Simplex Virus (HSV1) IgG | 11 | 11 | 0 | 11 | 0 | 0 |
| Herpes Simplex Virus (HSV1) IgM | 10 | 10 | 0 | 10 | 0 | 0 |
| Herpes Simplex Virus (HSV2) IgG | 12 | 12 | 0 | 12 | 0 | 0 |
| Herpes Simplex Virus (HSV2) IgM | 11 | 9 | 2 | 10 | 0 | 1 |
| *Treponema pallidum* (Syphilis) | 11 | 11 | 0 | 11 | 0 | 0 |
| Varicella Zoster Virus (VZV) IgM | 10 | 9 | 1 | 10 | 0 | 0 |
| Measles virus IgM | 10 | 10 | 0 | 10 | 0 | 0 |
| Mumps virus IgM | 10 | 10 | 0 | 10 | 0 | 0 |
| *Borrelia burgdorferi* IgM (Lyme IgM) | 11 | 11 | 0 | 11 | 0 | 0 |
| Influenza virus IgM | 10 | 10 | 0 | 10 | 0 | 0 |
| *Mycoplasma pneumoniae* IgM | 18 | 15 | 3 | 16 | 0 | 2 |
| Antinuclear antibodies (ANA) | 10 | 10 | 0 | 10 | 0 | 0 |
| Rheumatic Factors (RF) | 11 | 10 | 1 | 11 | 0 | 0 |
| Human Anti-mouse antibodies (HAMA) | 10 | 10 | 0 | 10 | 0 | 0 |
| Human Herpes Virus (HHV6) | 14 | 14 | 0 | 14 | 0 | 0 |
| Systemic Lupus Erythematosus (SLE) | 10 | 10 | 0 | 10 | 0 | 0 |
| Flu vaccinated patients | 10 | 10 | 0 | 10 | 0 | 0 |
| Elevated IgG | 10 | 10 | 0 | 10 | 0 | 0 |
| Elevated IgM | 11 | 11 | 0 | 11 | 0 | 0 |
| Epstein Barr Virus (EBV) Viral Capsid Antigen (VCA) IgG | 10 | 10 | 0 | 10 | 0 | 0 |
| Epstein Barr Virus (EBV) Epstein-Barr Nuclear Antigen (EBNA) IgG | 10 | 9 | 1 | 9 | 0 | 1 |
| **Total** | **371** | **348** | **23** | **353** | **2** | **16** |

2) Interference

Biokit evaluated the effect of the presence of commonly found endogenous substances on the performance of the ADVIA Centaur EBV-VCA IgM using negative, low positive, and high positive serum, EDTA plasma, and lithium heparin plasma contrived samples. No interference (false positive or false negative) was observed at the tested concentrations reported in **Table 4**.

**Table 4.** Interference study results.

| **Substance** | **Substance Test Concentration** |
|---|---|
| Hemoglobin | 1000 mg/dL |
| Bilirubin, conjugated | 40 mg/dL |
| Bilirubin, unconjugated | 40 mg/dL |
| Intralipid | 1500 mg/dL |
| Biotin | 3510 ng/mL |
| Cholesterol | 502 mg/dL |
| Protein (hyperproteinemic) | 15 g/dL |
| Protein (hypoproteinemic) | 3 g/dL |

3) Class Specificity

Provided data supports that ADVIA Centaur EBV-VCA IgM assay selectively detects EBV IgM antibodies.

4. Assay Reportable Range

Not Applicable

5. Stability:

1) Reagent Stability

The data support storage conditions for the kit reagents as listed in **Table 5**.

**Table 5.** Reagent stability.

| **Reagent** | **Storage Condition** | **Stability** |
|---|---|---|
| Primary and ancillary reagent packs | Unopened at 2 – 8°C | 12 months |
| | Onboard | 28 days |
| Calibrators | Unopened at 2 – 8°C | 12 months |
| | Opened at 2 – 8°C | 60 days |
| | At room temperature | 8 hours |
| Washes | Unopened at 2 – 25°C | 12 months |
| | Onboard | 1 month |
| Controls | Opened at 2 – 8°C | 60 days |

The data also support calibration interval stability of 28 days.

2) Sample Stability

The data support storage conditions for samples collected in serum, lithium heparin plasma, and EDTA plasma listed in **Table 6**.

**Table 6.** Summary of serum, EDTA plasma, and lithium heparin plasma stability.

| Storage Condition | Stability |
|---|---|
| After centrifugation at 2 – 8°C | 7 days |
| Separated samples at room temperature | 4 hours |
| Separated samples at 2 – 8°C | 7 days |
| Separated samples at -20°C | 1 month |
| Freeze/thaw cycles | 1 |

6. Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):
Not applicable.

7. Detection Limit:
Not applicable.

8. Assay Cut-Off:

A study to establish the ADVIA Centaur EBV-VCA IgM cut-off was performed using 231 clinical human leftover remnant and intended use serum samples. The cut-off value was determined by performing concordance and Receiver Operator Characteristic (ROC) analysis, using predicate (DiaSorin Liaison EBV IgM) results as the standard. The estimated cut-off value for ADVIA Centaur EBV-VCA IgM assay is 1.0 Index value.

9. Carry-Over:

The ADVIA Centaur EBV-VCA IgM is not susceptible to carry-over.

## B Comparison Studies:

1. Method Comparison with Predicate Device:

Biokit conducted a multisite study to evaluate clinical performance of the ADVIA Centaur EBV-VCA IgM on the ADVIA Centaur XP system by determining Positive Percent Agreement (PPA) and Negative Percent Agreement (NPA) with the predicate device, DiaSorin Liaison EBV IgM. A total of 1,428 leftover samples were collected over a contiguous time period from individuals for whom an EBV test was ordered (population 1). Of these, 188 were from unclassified serostatus individuals. Two hundred and two (202) samples with a known positive result (population 2) were evaluated as well. Of these 4 were from unclassified serostatus individuals. The study results otherwise showed that these populations included individuals with acute infection, past infection, or no serologic evidence of EBV infection. Testing was conducted at three sites in the U.S. representative of testing environments where the candidate device will be used. The results are presented in **Tables 7** and **8**:

**Table 7.** Results of the method comparison study evaluating population 1.

| ADVIA Centaur EBV-VCA IgM | LIAISON EBV IgM | | | |
|---|---|---|---|---|
| | **Negative** | **Equivocal** | **Positive** | **Total** |
| **Nonreactive** | 1294 | 2 | 26 | 1322 |
| **Reactive** | 41 | 3 | 62 | 106 |
| **Total** | 1335 | 5 | 88 | 1428 |
| | **NPA** = 96.71% (1294/1338) 95% CI: 95.61% - 97.54% | | **PPA** = 68.89% (62/90) 95% CI: 58.72% - 77.51% | |

Out of 90 samples that were positive on the reference assay, 53 were primary acute, and of those, 48 samples were positive on the ADVIA Centaur EBVM assay. The PPA in primary acute patients is therefore 90.57% with 95% CI of 79.75% - 95.90%. Primary acute in this study is defined as the presence of either EBV IgM or heterophile antibodies, and absence of EBNA IgG.

**Table 8.** Results of the method comparison study evaluating population 2.

| ADVIA Centaur EBV-VCA IgM | LIAISON EBV IgM | | | |
|---|---|---|---|---|
| | **Negative** | **Equivocal** | **Positive** | **Total** |
| **Nonreactive** | 0 | 0 | 0 | 0 |
| **Reactive** | 0 | 0 | 202 | 202 |
| **Total** | 0 | 0 | 202 | 202 |
| | | | **PPA** = 100.00% (202/202) 95% CI: 98.13% - 100.00% | |

The PPA and NPA in pediatric subjects are presented in **Tables 9** and **10**. For population 1, 84 samples were from unclassified serostatus individuals. For population 2, three samples were from unclassified serostataus individuals.

**Table 9.** Results of the method comparison study evaluating the pediatric population in population 1.

| ADVIA Centaur EBV-VCA IgM | LIAISON EBV IgM | | | |
|---|---|---|---|---|
| | **Negative** | **Equivocal** | **Positive** | **Total** |
| **Nonreactive** | 402 | 0 | 9 | 411 |
| **Reactive** | 19 | 1 | 48 | 68 |
| **Total** | 421 | 1 | 57 | 479 |
| | **NPA** = 95.26% (402/422) 95% CI: 92.79% - 96.91% | | **PPA** = 84.21% (48/57) 95% CI: 72.64% - 91.47% | |

Out of 57 pediatric subject samples that were positive on the reference assay, 46 were primary acute, and of those, 42 samples were positive on the ADVIA Centaur EBVM assay. The PPA in primary acute pediatric patients is therefore 91.30% with 95% CI of 79.68% -

96.57%. Primary acute in this study is defined as the presence of either EBV IgM or heterophile antibodies, and absence of EBNA IgG.

**Table 10.** Results of the method comparison study evaluating the pediatric population in population 2.

| ADVIA Centaur EBV-VCA IgM | LIAISON EBV IgM | | | |
|---|---|---|---|---|
| | **Negative** | **Equivocal** | **Positive** | **Total** |
| **Nonreactive** | 0 | 0 | 0 | 0 |
| **Reactive** | 0 | 0 | 155 | 155 |
| **Total** | 0 | 0 | 155 | 155 |
| | | | **PPA** = 100.00% (155/155) 95% CI: 97.58% - 100.00% | |

2. Matrix Comparison:

Biokit performed this study to assess the performance of different sample matrices with the ADVIA Centaur EBV-VCA IgM assay. The study evaluated 70 sets of matched samples collected in serum separator tube (SST), EDTA plasma, and lithium heparin plasma measured in singlicate using one lot of reagents. The data supports comparable performance of samples collected in serum and EDTA and lithium heparin plasma (**Table 11**).

**Table 11.** Results of regression analysis performed for matrix comparison study.

| Tube (y) vs. Serum (x) | Regression Equation | Sample Interval | N[a] | r[b] |
|---|---|---|---|---|
| Plasma, EDTA | y=1.00x - 0.03 Index | 0.12-12.35 Index | 70 | 1.00 |
| Plasma, lithium heparin | y=1.00x - 0.05 Index | 0.10-11.49 Index | 70 | 1.00 |

[a] Number of samples tested.
[b] Correlation coefficient.

## C Clinical Studies:

See Section B. Comparison Studies for clinical study results.

## D Clinical Cut-Off:

Not Applicable

## E Expected Values/Reference Range:

The ADVIA Centaur EBV-VCA IgM results for population 1 (N=1,428 samples) for all sites combined by age, group, and sex are summarized in **Table 12**.

**Table 12.** Expected values established using the ADVIA Centaur XP system and confirmed by assay comparison.

| Age Group (Years) | Sex | Reactive | | Nonreactive | | Total |
|---|---|---|---|---|---|---|
| | | N[a] | %[b] | N | % | |
| 2-21 | Male | 32 | 14.1% | 195 | 85.9% | 227 |
| | Female | 36 | 14.3% | 216 | 85.7% | 252 |
| | Overall | 68 | 14.2% | 411 | 85.8% | 479 |
| 13-21 | Male | 25 | 18.5% | 110 | 81.5% | 135 |
| | Female | 32 | 18.7% | 139 | 81.3% | 171 |
| | Overall | 57 | 18.6% | 249 | 81.4% | 306 |
| >21 | Male | 11 | 3.3% | 324 | 96.7% | 335 |
| | Female | 27 | 4.4% | 587 | 95.6% | 614 |
| | Overall | 38 | 4.0% | 911 | 96.0% | 949 |
| Total | Male | 43 | 7.7% | 519 | 92.3% | 562 |
| | Female | 63 | 7.3% | 803 | 92.7% | 866 |
| | Overall | 106 | 7.4% | 1322 | 92.6% | 1428 |

[a] Number of samples tested.
[b] Percentages are for the numbers of reactive and nonreactive in a given row.

## VIII Proposed Labeling:

The labeling supports the finding of substantial equivalence for this device.

## IX Conclusion:

The submitted information in this premarket notification is complete and supports a substantial equivalence decision.