MAR 1 4 2012

BioPlex® 2200 EBV IgG 510(k) Summary

510(k) Number: k120439 Date Prepared: February 29, 2012

Introduction

Bio-Rad Laboratories hereby submits this Special 510(k) in accordance with the requirements of SMDA 1990 and 21 CFR 807.92. This summary of 510(k) safety and effectiveness information provides detail as a basis for a determination of substantial equivalence for the BioPlex® 2200 EBV IgG Panel.

Submitter name, address and contact

Submitter	Contact Person
Bio-Rad Laboratories, Inc BioPlex Division 5500 E. Second Street Benicia, CA 94510	Juang Wang Regulatory Affairs Representative Phone: (510)741-4609 Fax: (510)741-3941

Device name and Classification

BioPlex 2200 EBV IgG

Classification Name	Epstein Barr Virus, Other
Common Name:	Multi-Analyte Detection System EBV IgG
Product Trade Name	BioPlex 2200 EBV IgG on the BioPlex 2200 Multi-Analyte Detection System
Device Class	Class I
Classification Panel	Microbiology
Regulation Number	866.3235
Product Code	LSE, JIX, JJY

Legally Marketed Predicate Device

BioPlex® 2200 EBV IgG Panel, k062211

INTENDED USE / INDICATIONS FOR USE

The BioPlex® 2200 EBV IgG kit is a multiplex flow immunoassay intended for the qualitative detection of IgG antibodies to three (3) separate EBV antigens; Epstein-Barr Virus Nuclear Antigen-1 (EBV NA-1), Viral Capsid Antigen (EBV VCA), and Early Antigen diffuse (EBV EA-D) in human serum. The test system can be used in

conjunction with the BioPlex 2200 EBV IgM kit as an aid in the laboratory diagnosis of infectious mononucleosis (IM).

The EBV IgG kit is intended for use with the Bio-Rad BioPlex 2200 System.

Assay performance characteristics have not been established for immunocompromised or immunosuppressed patients, cord blood, neonatal specimens, or infants. Assay performance characteristics have not been established for the diagnosis of nasopharyngeal carcinoma, Burkitt's lymphoma, and other EBV-associated lymphomas.

Device Description

The EBV IgG kit uses multiplex flow immunoassay, a methodology that greatly resembles traditional EIA, but permits simultaneous detection and identification of many antibodies in a single tube. Three (3) different populations of beads are coated with *E. coli* derived recombinant proteins, EBV NA-1 (28kD and 45kD), EBV VCA p18 (40kD), and EBV EA-D (28kD) associated with infectious mononucleosis.12-13 The BioPlex 2200 System combines an aliquot of patient sample, sample diluent, and bead reagent into a reaction vessel. The mixture is incubated at 37°C. After a wash cycle, antihuman IgG antibody, conjugated to phycoerythrin (PE), is added to the dyed beads and this mixture is incubated at 37°C. The excess conjugate is removed in another wash cycle, and the beads are re-suspended in wash buffer. The bead mixture then passes through the detector. The identity of the dyed beads is determined by the fluorescence of the dyes, and the amount of antibody captured by the antigen is determined by the fluorescence of the attached PE. Raw data is calculated in relative fluorescence intensity (RFI).

Three additional dyed beads, an Internal Standard Bead (ISB), a Serum Verification Bead (SVB) and a Reagent Blank Bead (RBB) are present in each reaction mixture to verify detector response, the addition of serum or plasma to the reaction vessel and the absence of significant non-specific binding in serum or plasma. Refer to the BioPlex 2200 System Operation Manual for more information. The instrument is calibrated using a set of seven (7) distinct calibrator vials, supplied separately by Bio-Rad Laboratories. A combination of four (4) vials representing four (4) different antibody concentrations are used for semi-quantitative calibration. The result for each of these antibodies is expressed as an antibody index (AI).

Similarities and Differences

Similarities

Feature	Modified Device
Intended Use/Indications For Use	No Change
Kit components	No Change
Technical Specifications	No Change
Fundamental Scientific Technology	No Change

Differences

The differences are to modify QC testing from each reagent pack to once per day as stated in the Instructions For Use (IFU) of the BioPlex® 2200 EBV IgG and to add protein stabilizer and protease inhibitor in the particle (bead) diluent.

Feature	Modified	Predicate
Frequency of Reagent Pack QC Testing	QC once per day or per new reagent pack lot	QC once per pack and per day
Microbial Contamination Prevention	Addition of protein stabilizer and protease inhibitors in the particle (bead) diluent	None

Summary of Design Control Activities

A Failure Mode and Effect Analysis (FMEA) was used to facilitate, capture, and quantify potential impacts of false positive or negative patient results. The Risk Priority Number (RPN) is a quantitative measure of the combined effects of severity, occurrence, and detection of potential risks. Specific mitigations are recommended that may include changes to the design or formulation if the RPN score exceeds a chosen threshold.

The Design Control Activities include Risk Analysis method to identify the verification and validation activities required, test used, and acceptance criteria.

Based on the conclusion of the risk management report, the modified QC procedure fulfills the requirements of the specifications of the design control process. Therefore, the performance of the modified QC test frequency is substantially equivalent to the current cleared kit.

BioPlex® 2200 Syphilis IgG 510(k) Summary

510(k) Number: K120439 Date Prepared: March 14, 2012

Introduction

Bio-Rad Laboratories hereby submits this Special 510(k) in accordance with the requirements of SMDA 1990 and 21 CFR 807.92. This summary of 510(k) safety and effectiveness information provides detail as a basis for a determination of substantial equivalence for the BioPlex® 2200 Syphilis IgG Panel.

Submitter name, address and contact

Submitter	Contact Person
Bio-Rad Laboratories, Inc BioPlex Division 5500 E. Second Street Benicia, CA 94510	Juang Wang Regulatory Affairs Representative Phone: (510)741-4609 Fax: (510)741-3941

Device name and Classification

BioPlex 2200 Syphilis IgG

Classification Name	*Treponema pallidum* treponemal test reagents
Common Name:	Multi-Analyte Detection System Syphilis IgG
Product Trade Name	BioPlex 2200 Syphilis IgG on the BioPlex 2200 Multi-Analyte Detection System
Device Class	Class II
Classification Panel	Microbiology
Regulation Number	866.3830
Product Code	LIP, JIX, JJY

Legally Marketed Predicate Device

BioPlex® 2200 Syphilis IgG Panel, k063866

INTENDED USE / INDICATIONS FOR USE

The BioPlex® 2200 Syphilis IgG kit is a multiplex flow immunoassay intended for the qualitative detection of *Treponema pallidum* IgG antibodies in human serum. The test system, when used in conjunction with non-treponemal based assays, provides

serological evidence of infection with *T. pallidum*. This test system also confirms reactive test results form non-treponemal based screening assays.

The Syphilis IgG kit is intended for use with the Bio-Rad BioPlex 2200 System.

The BioPlex 2200 Syphilis IgG kit is not intended for use in screening blood or plasma donors

Warning: A positive result is not useful for establishing a diagnosis of Syphilis. In most situations, such a result may reflect prior treated infection; a negative result can exclude a diagnosis of syphilis except for incubating or early primary disease.

Device Description

The Syphilis IgG kit uses multiplex flow immunoassay, a methodology that greatly resembles traditional EIA, but permits simultaneous detection and identification of many antibodies in a single tube. Three (3) different populations of beads are coated with recombinant proteins associated with *T. pallidum* (15kD, 17kD, and 47kD). The BioPlex 2200 System combines an aliquot of patient sample, sample diluent, and bead reagent into a reaction vessel. The mixture is incubated at 37°C. After a wash cycle, anti-human IgG antibody, conjugated to phycoerythrin (PE), is added to the dyed beads and this mixture is incubated at 37°C. The excess conjugate is removed in another wash cycle, and the beads are re-suspended in wash buffer. The bead mixture then passes through the detector. The identity of the dyed beads is determined by the fluorescence of the dyes, and the amount of antibody captured by the antigen is determined by the fluorescence of the attached PE. Raw data is calculated in relative fluorescence intensity (RFI).

Three additional dyed beads, an Internal Standard Bead (ISB), a Serum Verification Bead (SVB) and a Reagent Blank Bead (RBB) are present in each reaction mixture to verify detector response, the addition of serum or plasma to the reaction vessel and the absence of significant non-specific binding in serum or plasma. Refer to the BioPlex 2200 System Operation Manual for more information.

The system is calibrated using a set of four (4) distinct calibrator vials, supplied separately by Bio-Rad Laboratories. Four (4) vials representing two (2) or three (3) different antibody concentrations are used for calibration. Results are calculated for each of the three (3) antibodies and are compared against their own respective cut-off and are expressed as an antibody index (AI). A single result is reported after completing a composite analysis of all the antibodies (the highest AI value is reported).

Similarities and Differences

Similarities

Feature	Modified Device
Intended Use/Indications For Use	No Change
Kit components	No Change
Technical Specifications	No Change
Fundamental Scientific Technology	No Change

Differences

The differences are to modify QC testing from each reagent pack to once per day as stated in the Instructions For Use (IFU) of the BioPlex® 2200 Syphilis IgG and to add protein stabilizer and protease inhibitor in the particle (bead) diluent.

Feature	Modified	Predicate
Frequency of Reagent Pack QC Testing	QC once per day or per new reagent pack lot	QC once per pack and per day
Microbial Contamination Prevention	Addition of protein stabilizer and protease inhibitors in the particle (bead) diluent	None

Summary of Design Control Activities

A Failure Mode and Effect Analysis (FMEA) was used to facilitate, capture, and quantify potential impacts of false positive or negative patient results. The Risk Priority Number (RPN) is a quantitative measure of the combined effects of severity, occurrence, and detection of potential risks. Specific mitigations are recommended that may include changes to the design or formulation if the RPN score exceeds a chosen threshold.

The Design Control Activities include Risk Analysis method to identify the verification and validation activities required, test used and acceptance criteria.

Based on the conclusion of the risk management report, the modified QC procedure fulfills the requirements of the specifications of the design control process. Therefore, the performance of the modified QC test frequency is substantially equivalent to the current cleared kit.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration

10903 New Hampshire Avenue
Silver Spring, MD 20993

Bio-Rad Laboratories, Inc.
c/o Mr. Juang Wang
Regulatory Affairs Representative
BioPlex Division
5500 E. Second Street
Benicia, CA 94510

MAR 14 2012

Re: K120439
Trade Device Name: BioPlex 2200 EBV IgG and Syphilis on the BioPlex 2200 Multi-Analyte Detection System
Regulation Number: 21 CFR 866.3830
Regulation Name: *Treponema pallidum* treponemal test reagents
Regulatory Class: Class II
Product Code: LIP, LSE, JIX, JJY
Dated: February 9, 2012
Received: February 13, 2012

Dear Mr. Wang:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into class II (Special Controls), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the

requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820). This letter will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Parts 801 and 809), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/cdrh/industry/support/index.html.

Sincerely yours,

Sally A. Hojvat, M.Sc., Ph.D.
Director
Division of Microbiology Devices
Office of *In Vitro* Diagnostic Device Evaluation and Safety
Center for Devices and Radiological Health

Enclosure

Indication(s) For Use Statement

510(k) Number (if known): K120439

Device Name: BioPlex 2200 EBV IgG kit on the
BioPlex 2200 Multi-Analyte Detection System

Indications for Use:

The BioPlex® 2200 EBV IgG kit is a multiplex flow immunoassay intended for the qualitative detection of IgG antibodies to three (3) separate EBV antigens; Epstein-Barr Virus Nuclear Antigen-1 (EBV NA-1), Viral Capsid Antigen (EBV VCA), and Early Antigen diffuse (EBV EA-D) in human serum. The test system can be used in conjunction with the BioPlex 2200 EBV IgM kit as an aid in the laboratory diagnosis of infectious mononucleosis (IM).

The EBV IgG kit is intended for use with the Bio-Rad BioPlex 2200 System.

Assay performance characteristics have not been established for immunocompromised or immunosuppressed patients, cord blood, neonatal specimens, or infants. Assay performance characteristics have not been established for the diagnosis of nasopharyngeal carcinoma, Burkitt's lymphoma, and other EBV-associated lymphomas.

Prescription Use __x__ AND/OR Over-the-Counter Use _____
(Part 21 CFR 801 Subpart D) (21 CFR 801 Subpart C)

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Concurrence of CDRH, Office of In Vitro Diagnostic Devices (OIVD)

Tamara Kibbe

Division Sign-Off
Office of In Vitro Diagnostic
Device Evaluation and Safety

510(k) K120439

Indication(s) For Use Statement

510(k) Number (if known): K120439

Device Name: BioPlex® 2200 Syphilis IgG kit on the
BioPlex® 2200 Multi-Analyte Detection System

Indications for Use:

The BioPlex® 2200 Syphilis IgG kit is a multiplex flow immunoassay intended for the qualitative detection *Treponema pallidum* in human serum. The test system, when used in conjunction with non-treponemal based assays, provides serological evidence of infection with *T. pallidum*. This test system also confirms reactive test results form non-treponemal based screening assays.

The Syphilis IgG kit is intended for use with the Bio-Rad BioPlex 2200 System.

The BioPlex 2200 Syphilis IgG kit is not intended for use in screening blood or plasma donors

Warning: A positive result is not useful for establishing a diagnosis of Syphilis. In most situations, such a result may reflect prior treated infection; a negative result can exclude a diagnosis of syphilis except for incubating or early primary disease.

Prescription Use __x__ AND/OR Over-the-Counter Use _____
(Part 21 CFR 801 Subpart D) (21 CFR 801 Subpart C)

(Please do not write below this line-Continue on another page if needed)

Concurrence of CDRH, Office of In Vitro Diagnostic Devices (OIVD)

Tamara Feldblum
Division Sign-Off
Office of In Vitro Diagnostic
Device Evaluation and Safety

510(k) K120439