NOV - 9 1999

K991880

510(k) Summary

Submitter: ***Light Diagnostics***
28835 Single Oak Drive
Temecula, CA 92590
Tel: 909/676-8080
Fax: 909/676-9209

Contact Person: Cindy Penny

Product Name
Trade Name: ***Light Diagnostics*** **SimulFluor® HSV1/2**
Common Name: Immunofluorescence Assay
Classification Name: Herpes simplex virus
Classification Number: 866.3305-83LKC

Intended Use:

Light Diagnostics **SimulFluor® HSV1/2 Immunofluorescence Assay** is a direct immunofluorescence test intended for the detection and identification of herpes simplex virus type 1 (HSV-1) or herpes simplex virus type 2 (HSV-2) following amplification in cell culture or by direct examination of clinical specimens prepared by cytocentrifugation. Specimens found to be negative on direct specimen examination should be tested by cell culture.

For *in vitro* diagnostic use.

Predicate Devices:

1) Bartels Herpes Simplex Virus Type-Specific Fluorescent Monoclonal Antibody Test (HSV Typing)
The Bartels HSV Typing Test is intended for use in the qualitative identification and differentiation of herpes simplex virus (HSV) type 1 and type 2 in inoculated cell cultures.
For *in vitro* diagnostic use.

2) DPC PathoDx® Herpes Typing Kit
The DPC PathoDx® Herpes Typing Kit is an immunofluorescence test designed for the detection and typing of herpes simplex virus types I and II (HSV-I and HSV-II) in direct clinical specimens and following growth in tissue culture. All direct clinical specimens which are negative or have inadequate numbers of cells must be reevaluated by cell culture.
For *in vitro* diagnostic use.

Device description:

***Light Diagnostics* SimulFluor® HSV 1/2 Immunofluorescence Assay** utilizes a single reagent for the simultaneous detection and identification of HSV-1 and HSV-2. The **SimulFluor® HSV 1/2** Reagent consists of two components; the primary component specific for HSV-1 will bind to the glycoprotein C and a capsid-associated protein in HSV-1 infected cells, while the secondary component, specific for HSV-2, will bind to the glycoprotein G in HSV-2 infected cells. Unbound reagent is removed by rinsing with phosphate-buffered saline (PBS). Illumination with ultraviolet light allows visualization of the antigen-antibody complexes by fluorescence microscopy. When an FITC filter set is used, HSV-1- infected cells will exhibit apple-green fluorescence and HSV-2-infected cells will exhibit yellow-gold fluorescence. The uninfected cells will stain a dull red due to the presence of Evans blue in the **SimulFluor® HSV 1/2** reagent.

A blend of monoclonal antibodies directed against HSV-1 and HSV-2 is used in the ***Light Diagnostics* SimulFluor® HSV 1/2** reagent. The use of monoclonal antibodies ensures increased specificity of reagent and reduces the risk of non-specific background or interference.

Technological Comparison of Methods:

The ***Light Diagnostics* SimulFluor® HSV1/2 Immunofluorescence Assay** is substantially equivalent to Bartels HSV Typing and the DPC PathoDx® Herpes Typing DFA reagents:

A. All three methods are intended for use in the detection of HSV-1 and HSV-2 antigens in infected cells.

B. All three methods are *in vitro* test methods.

C. All three methods use a direct immunofluorescence assay procedure for staining of slides using FITC filter sets.

D. Two of the three methods (PathoDx® and SimulFluor®) are intended for the detection of HSV-1 and HSV-2 in direct patient specimens.

The methods differ in that:

A. The ***Light Diagnostics*** **SimulFluor® HSV 1/2 Immunofluorescence Assay** consists of one reagent which contains specific monoclonal antibodies directed against HSV-1 and HSV-2 and tagged with two different fluorescent labels. This allows simultaneous visualization and identification of both HSV-1 and HSV-2-infected cells in one well. Both PathoDx® and Bartels kits consist of two separate reagents, each of which contains FITC-labeled monoclonal antibodies directed against either HSV-1 or HSV-2. Two separate wells are necessary to detect and identify both viruses in one sample.

Performance Data for *Light Diagnostics* SimulFluor® HSV 1/2 Immunofluorescence Assay:

1. Non-clinical evaluation:
   The conjugated monoclonal antibodies used in the ***Light Diagnostic*** **SimulFluor® HSV 1/2** reagent were characterized for their ability to detect HSV types 1 and 2. These antibodies reacted with either HSV-1 or HSV-2 when tested with reference viral strains and clinical isolates. The conjugated monoclonal antibodies were also tested against a variety of viruses and bacteria including those that present as herpetic-like lesions, and cell lines commonly used to isolate HSV-1 and HSV-2. No cross-reactivity was observed.

2. Clinical evaluation:
   Clinical studies were conducted at two clinical sites. At site one (Site 1) in the north-central United States, the staining of the ***Light Diagnostics*** **SimulFluor® HSV 1/2 Immunofluorescence Assay** on direct specimens was compared to culture confirmation using the Predicate Device for the detection and identification of HSV-1 and HSV-2. At a second site in the southwestern United States (Site 2), the ***Light Diagnostics*** **SimulFluor® HSV 1/2 Immunofluorescence Assay** was compared to the Predicate Device in spin-amplified shell vials and standard culture for the detection and identification of HSV-1 and HSV-2. The ***Light Diagnostics*** **SimulFluor® HSV 1/2 Immunofluorescence Assay** was compared to the Bartels HSV Typing Test at Site 1 and the DPC PathoDx® Herpes Typing kit at Site 2.

Clinical Study: Site 1

One hundred and ninety-one specimens were submitted to a clinical virology laboratory for the detection of HSV. Slides from patient specimens were prepared by cytocentrifugation for direct specimen testing and inoculated into standard tube culture for the isolation of HSV. The direct specimen and culture confirmation results obtained by the **SimulFluor® HSV 1/2** reagent was compared to the culture confirmation stained with Bartel's HSV Typing Reagent. Of the 191 specimens submitted, forty samples had insufficient cells for direct evaluation, one culture was contaminated, and three samples were found positive for varicella zoster virus.

Compared to culture, direct specimen testing using the **SimulFluor® HSV 1/2** reagent had a sensitivity of 89.5% (17/19) (95% Confidence Interval of 66.6% to 98.7%, Exact) and specificity of 100% (128/128) (95% Confidence Interval of 97.2% to 100%, Exact) with a percent agreement of 98.6% (95% Confidence Interval of 95.2% to 99.8%, Exact) for the detection of HSV-1; and a sensitivity of 92.6% (25/27) (95% Confidence Interval of 75.7% to 99.1%, Exact) and specificity of 100% (120/120) (95% Confidence Interval of 97% to 100%, Exact) with a percent agreement of 98.6% (95% Confidence Interval of 95.2% to 99.8%, Exact) for the detection of HSV-2.

Thirty-three HSV-1 and 29 HSV-2 isolates were identified with both reagents. When compared to the Comparative Device, the **SimulFluor® HSV 1/2** reagent had 100% correlation for the detection of both HSV-1 and HSV-2 for a percent agreement of 100% for both HSV-1 and HSV-2. The 95% confidence intervals were 98% to 100%, Exact.

Clinical Study: Site 2

Two hundred and twenty-eight specimens were submitted to a reference laboratory for HSV identification. Two hundred and twenty-seven specimens were cultured in standard cultures using 24-well cluster plates and 214 specimens were cultured in spin-amplified shell vials. The **SimulFluor® HSV 1/2** reagent was compared to DPC's PathoDx® Herpes Typing Kit for both culture methods.

Two hundred and fourteen shell vials were inoculated and stained with both the **SimulFluor® HSV 1/2** and the Comparative Device. Twenty-four HSV-1 and thirty-seven HSV-2 isolates were detected with the Comparative Device. The **SimulFluor® HSV 1/2** reagent identified an additional isolate which was not detected in standard culture. The percent agreement for the detection of HSV-1 by the **SimulFluor® HSV 1/2** reagent is 96% (95% Confidence Interval of 79.6% to 99.9%, Exact). For the detection of HSV-2 the percent agreement was 100%.

Two hundred and twenty-seven specimens were inoculated in 24-well culture plates for isolation of herpes, and stained with **SimulFluor® HSV 1/2** and the Comparative Device. Thirty-two isolates of HSV-1 and 46 isolates of HSV-2 were detected in culture by both reagents. There was 100% agreement between the two reagents for the detection of HSV-1 and HSV-2 with a percent agreement of 100% for the detection of HSV-1 and HSV-2 by the **SimulFluor® HSV1/2** reagent. Overall Percent Agreement was 100% (227/227) [95% Confidence Interval of 98.4 to 100%, Exact].

3. Conclusions drawn from evaluations:

***Light Diagnostics* SimulFluor® HSV 1/2 Immunofluorescence Assay** uses a standard direct immunofluorescence assay procedure for the detection of HSV-1 and HSV-2 in patient specimens and in cell culture. The monoclonal antibodies used in the reagent have been characterized so as to ensure specificity and reliability of the product. In clinical evaluations, the performance characteristics of the reagent were shown to be substantially equivalent to those of Bartels HSV Typing Test and the DPC PathoDx® Herpes Typing kit.

The characterization and clinical evaluation of the ***Light Diagnostics* SimulFluor® HSV 1/2 Immunofluorescence Assay** demonstrates the safety and effectiveness of this product when used as intended in the product insert.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

NOV - 9 1999

Ms. Cindy Penny
Manager, Quality Assurance
Chemicon International, Inc.
28835 Single Oak Drive
Temecula, California 92590

Re: K991880
Trade Name: Light Diagnostics SimulFluor™ HSV ½ Immunofluorescence
Regulatory Class: III
Product Code: GQN
Dated: August 31, 1999
Received: September 2, 1999

Dear Ms. Penny:

We have reviewed your Section 510(k) notification of intent to market the device referenced above and we 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). 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 either class II (Special Controls) or class III (Premarket Approval), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 895. A substantially equivalent determination assumes compliance with the Current Good Manufacturing Practice requirements, as set forth in the Quality System Regulation (QS) for Medical Devices: General regulation (21 CFR Part 820) and that, through periodic QS inspections, the Food and Drug Administration (FDA) will verify such assumptions. Failure to comply with the GMP regulation may result in regulatory action. In addition, FDA may publish further announcements concerning your device in the Federal Register. Please note: this response to your premarket notification submission does not affect any obligation you might have under sections 531 through 542 of the Act for devices under the Electronic Product Radiation Control provisions, or other Federal laws or regulations.

Under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88), this device may require a CLIA complexity categorization. To determine if it does, you should contact the Centers for Disease Control and Prevention (CDC) at (770)488-7655.

This letter will allow you to begin marketing your device as described in your 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 Part 801 and additionally 809.10 for in vitro diagnostic devices), please contact the Office of Compliance at (301) 594-4588. Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers Assistance at its toll free number (800) 638-2041 or at (301) 443-6597 or at its internet address "http://www.fda.gov/cdrh/dsmamain.html"

Sincerely yours,

Steven Gutman

Steven I. Gutman, M.D., M.B.A.
Director
Division of Clinical Laboratory Devices
Office of Device Evaluation
Center for Devices and Radiological Health

Enclosure

510(k) Number (if known): K991880

Device Name: Light Diagnostics Simulfluor™ HSV 1 / 2 Immunofluorescence Assay

Indications For Use: ***Light Diagnostics*** **SimulFluor™ HSV1/2 Immunofluorescence Assay** is a direct immunofluorescence test intended for the detection and identification of herpes simplex virus type 1 (HSV-1) and herpes simplex virus type 2 (HSV-2) following amplification in cell culture or by direct examination of clinical specimens prepared by cytospin. Specimens found to be negative on direct specimen examination should be tested by cell culture.
For *in vitro* diagnostic use.

(PLEASE DO NOT WRITE BELOW THIS LINE - CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

Woody Dubois

(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K991880

Prescription Use X OR Over-The-Counter-Use _____
(Per 21 CFR 801.109)