K970742
Oct. 22, 1997

Attachment F

Summary of Safety and Effectiveness

Submitter Information (21 CFR 807.92(a)(1))

Submitter: Becton Dickinson Immunocytometry Systems
2350 Qume Drive
San Jose, CA 95131-1807

Contact: Anna Longwell, Esq.
Director, Regulatory Affairs - Corporate
(408) 954-2254

Summary date: February 26, 1997

Name of Device and Classification (21 CFR 807.92(a)(2))

Name: Becton Dickinson TriTEST™ reagent CD3 FITC/CD19 PE/CD45 PerCP; TruCount™ Absolute Count Tubes

Classification: Class II

Predicate Device (21 CFR 807.92(a)(3))
The BDIS TriTEST™ CD3 FITC/CD19 PE/CD45 PerCP reagent with TruCount Absolute Count Tubes is substantially equivalent to Simultest™ IMK-Lymphocyte Tube C (cleared to market under 510(k) K913192) plus ADCC. TriTEST reagent CD3/CD19/CD45, when used to enumerate percentages of T and B lymphocytes was cleared to market under 510(k) K950342.

Description of the Device (21 CFR 807.92(a)(4))
The BDIS TriTEST CD3 fluorescein isothiocyanate (FITC)/CD19 phycoerythrin (PE)/CD45 peridinin chlorophyll protein (PerCP) reagent is a three-color, direct immunofluorescence reagent for identifying and enumerating percentages of T lymphocytes (CD3+) and B lymphocytes (CD19+) in erythrocyte-lysed whole blood (LWB). When used with TruCount Absolute Count Tubes, the product will yield absolute counts in cells/μL. The Becton Dickinson TriTEST/TruCount system for immunophenotyping consists of a flow cytometer (either from BDIS or from another manufacturer), conjugated monoclonal reagent (TriTEST CD3 FITC/CD19 PE/CD45 PerCP) and TruCount Absolute Count Tubes.

The process to obtain lymphocyte subset percentages includes: 1) obtaining a whole blood sample, 2) cell-surface antigen staining with three-color monoclonal antibody reagents, 3) erythrocyte lysis, and 4) flow cytometric acquisition and analysis of list mode data. Analysis involves computing the ratio of reagent-positive events (CD3+ and CD19+) to the CD45 positive events, and expressing the ratio as a percentage.

To obtain absolute counts, the TriTEST reagent and whole blood are added directly to an Absolute Count Tube prior to lysis. The remaining process, until analysis, is identical to that for percentages. Analysis for absolute counts requires that an additional region, the bead region,

be identified and the events in this region counted. The proportion of reagent positive events to bead events (P) is computed. The absolute count is P x (beads/pellet)/(volume of blood sample).

When monoclonal antibody reagents are added to human whole blood, the fluorochrome-labeled antibodies bind specifically to antigens on the surface of leucocytes, thus identifying lymphocyte populations. The patient blood sample is added to the counting bead pellet and is treated with fluorochrome-labeled antibodies and the erythrocytes are lysed with FACS® Lysing Solution. The flow cytometer is set up so that cell populations for most samples occupy approximately the same region of fluorescence space. The sample is then introduced into the flow cytometer and the stained cells and beads fluoresce when excited by a laser beam.

The three-color reagent permits identification of lymphocyte subsets using fluorescence gating instead of forward scatter gating. This three-color reagent allows direct gating on the CD45-positive population using a combination of fluorescence and side scatter parameters. By gating on the CD45-positive population, a maximum number of lymphocytes may be captured in the gate and non-lymphocyte contamination may be minimized.

Intended Use (21 CFR 807.92(a)(5))
For in vitro diagnostic use to identify and enumerate percentages and absolute counts of T and B lymphocytes in blood.

Indications for Use

- For use with any flow cytometer with specified detection ranges
- For use with erythrocyte lysed whole blood
- For use with or without an isotype control
- For in vitro diagnostic use
- To identify and enumerate percentages and absolute counts of CD3+ and CD19+ lymphocytes
- To characterize and monitor some forms of immunodeficiency
- To characterize and monitor some forms of autoimmune diseases

Clinical Utility
The enumeration of T (CD3+) and B (CD19+) lymphocytes has been found useful in monitoring some forms of immunodeficiency and autoimmune disease.

Comparison to Predicate Device (21 CFR 807.92(a)(6))
The three-color reagent is substantially equivalent to the predicate: Simultest™ IMK-Lymphocyte Tube C plus hematology analyzer in that they share the same intended uses. The Simultest portion of the predicate and the TriTEST reagent use essentially the same monoclonal antibody/flow cytometric methodology. The TriTEST and Simultest products differ in the steps used to determine analysis gates to identify the lymphocyte population. The TriTEST/TruCount system compared to the predicate, requires less sample handling, a simpler sample preparation scheme and fewer sample tubes to achieve the same end result. Results demonstrate that the products yield essentially equivalent performance characteristics.

Performance Data (21 CFR 807.92(b)(2))
Performance of the product was established by testing at Cleveland Clinic, Johns Hopkins Hospital, Institute of Tropical Medicine, University of North Carolina, and at Becton Dickinson Immunocytometry Systems laboratories in San Jose, California.

Several studies were performed:

- Accuracy was determined by comparison to Simultest/ADCC. Accuracy data demonstrated the TriTEST/TRUCOUNT product's equivalence to Simultest/ADCC.

- Use of an Isotype Control was studied. Data was analyzed for percent T lymphocytes and percent B lymphocytes first using a control to set quadrant markers and then using only the stained sample to set quadrant markers. Data indicated that the reagent may be used with or without an isotype control.

- Reference range studies were performed. Many variables such as age, sex and geographical location may influence the reference range. Each site must determine its own reference range.

- A stability study was conducted to assess the time effect relating to age of blood (time-from-draw) and the time effect relating to the age of the stain (time-from-sample preparation), as well as the combined effect of both. Stability was determined for both percentages and absolute counts. Results indicate that for absolute counts, samples should be stained and analyzed within 6 hours of draw.

- Within-specimen reproducibility was performed at BDIS; 10 replicates from 1 high, 1 medium, and 1 low (with respect to T and B lymphocytes) were assessed. Within-specimen reproducibility was also performed at 3 clinical sites; 3 aliquots from each donor (n=92 for CD3+ and n=80 for CD19+) were assessed. Results demonstrated acceptable within-sample reproducibility.

- Linearity was determined using blood samples from 3 normal donors diluted to 5 concentrations, ranging from 16,700 to 200 lymphocytes/µL and from 31,000 to 2,500 WBC/µL. Results indicate a linear response over this range.

- Cross reactivity of these clones is reported in the literature. Conjugation and product formulation have not changed their specificity.

- Results from a cross platform reproducibility study indicated that TriTEST CD3 FITC/CD19 PE/CD45 PerCP with or without TRUCOUNT tubes may be used with flow cytometers not made by Becton Dickinson.

Performance Data - Conclusions (21 CFR 807.92(b)(3))
The results of the clinical studies demonstrate that the device is as safe and effective as the predicate device.

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

Anna Longwell, Esq.
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Becton Dickinson Immunocytometry Systems
2350 Qume Drive
San Jose, CA 95131-1807

OCT 22 1997

Re: K970742
Trade Name: Becton Dickinson TriTEST™ Reagent CD3 FITC/CD19 PE/CD45 PerCP; TruCOUNT™ Absolute Count Tubes
Regulatory Class: II
Product Code: GKZ
Dated: August 29, 1997
Received: September 02, 1997

Dear Ms. Longwell:

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 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 requirement, 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

Number (if known): K970742

Phone: _____

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

Concurrence of CDRH, Office of Device Evaluation (ODE)

Peter E. Maus

(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K970742

Prescription Use X
(Per 21 CFR 801.109)

OR

Over-The-Counter Use ____

(Optional Format 1-2-96)

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