

K 9937 41

JUL - 3 2000



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510(k) SUMMARY OF SAFETY AND EFFECTIVENESS
EZ LDL-C™ Test System, Procedure 358

Blood total cholesterol levels have long been known to be related to coronary heart disease (CHD). In recent years, in addition to total cholesterol, low density lipoprotein cholesterol (LDL-C) has become an important tool used to assess an individual risk of developing CHD since a strong positive relationship between LDL-C concentration and the incidence of CHD was reported.¹ Thus, there has been substantial interest in LDL-C measurements, and most clinical laboratories routinely perform LDL-C analysis. The currently accepted reference method is generally referred to as "beta quantification,"² which involves ultracentrifugation. Because this method is labor intensive and technique dependent, it is not generally used for routine testing. The Friedewald formula³ is most commonly used for routine purposes. However, since the formula estimates LDL-C from measurements of total cholesterol, triglycerides and high-density lipoprotein cholesterol (HDL-C), the LDL-C calculation depends on the accuracy and precision of the three measurements. The EZ LDL Cholesterol test is a homogeneous assay, which eliminates the preparatory steps or calculation, and thus, can be applied on automated analyzers.

The Sigma Diagnostics EZ LDL procedure is based on an enzymatic selective protection (ESP) methodology. When a sample is mixed with EZ LDL Reagent 1, the protecting reagent binds to LDL and protects LDL from enzyme reactions. Cholesterol esterase (CHE) and cholesterol oxidase (CO) react with non-LDL lipoproteins (chylomicrons(CM), very low-density lipoprotein (VLDL) and HDL). Hydrogen peroxide produced by the enzyme reactions with non-LDL cholesterol is decomposed by catalase in EZ Reagent 1. When EZ LDL Reagent 2 is added, the protecting reagent is removed from LDL and catalase is inactivated by sodium azide (NaN₃). In this second process, CHE and CO react only with LDL-C. Hydrogen peroxide produced by the enzyme reactions with LDL-C yields a color complex upon oxidase condensation with N-(2-hydroxy-3-sulfopropyl)-3,5-dimethoxyaniline (HDAOS) and 4-aminoantipyrine (4AA) in the presence of peroxidase (POD). By measuring the absorbance of the blue color complex produced, at approximately 600 nm, the LDL-C concentration in the sample can be calculated when compared with the absorbance of the LDL-C calibrator.

The Sigma Diagnostics EZ LDL™ Cholesterol test system (Procedure No. 358) is substantially equivalent to, and are the same product as the Wako Chemical USA, Inc. Direct LDL-C test system cleared by the FDA as K982271.

References

1. Burtis CA, Ashwood ER: Ed Teitz Textbook of Clinical Chemistry, 2nd Ed, Saunders, Philadelphia, 1994
2. Rifai N, Warnick GR, Dominiczak MH: Ed Handbook of Lipoprotein Testing. AACC Press, Washington, DC, USA, 1997
3. Friedewald WT, Levy RI, Frederickson DS: Estimation of the concentration of low-density lipoprotein cholesterol in plasma without the use of the ultracentrifuge. Clin Chem 18, 449-502, 1972

Sincerely,

William R. Gilbert Ph.D.
Manager, Scientific Affairs

Handwritten notes: 4/10/00, 1/1/01



DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

JUL - 3 2000

William R. Gilbert, Ph.D.
Manager, Scientific Affairs
Sigma Diagnostics, Inc.
545 South Ewing Avenue
St. Louis, Missouri 63103

Re: K993741
Trade Name: EZ LDL™ Cholesterol Test System
Regulatory Class: I reserved
Product Code: MRR
Regulatory Class: II
Product Code: JIS
Dated: May 25, 2000
Received: May 31, 2000

Dear Dr. Gilbert:

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.

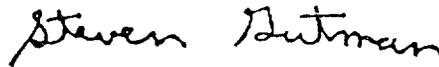
A substantially equivalent determination assumes compliance with the Current Good Manufacturing Practice requirements, as set forth in the Quality System Regulation (QS) for Medical Devices: General regulation (21 CFR Part 820) and that, through periodic QS inspections, the Food and Drug Administration (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.

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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" (21CFR 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 (301) 443-6597 or at its internet address "<http://www.fda.gov/cdrh/dsma/dsmamain.html>".

Sincerely yours,

A handwritten signature in cursive script that reads "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): K993741

Device Name: EZ LDL™ Cholesterol Test system

Indications For Use:

The Sigma Diagnostics EZ™ LDL- cholesterol test system is a device intended to measure LDL-cholesterol in plasma and serum. Cholesterol measurements are used in the diagnosis and treatment of disorders involving excess cholesterol in the blood and lipid and lipoprotein metabolism disorders.

Jean Cooper
(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K993741

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

Concurrence of CDRH, Office of Device Evaluation (ODE)

Prescription Use
(Per 21 CFR 801.109)

OR

Over-The-Counter Use