K 972609

BIO-RAD

Bio-Rad Laboratories

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AUG - 6

SUMMARY OF SAFETY AND EFFECTIVENESS

Submitter:

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Contact Person:

John W. Nelson
Manager, Regulatory Affairs

Date Prepared:

June 30, 1997

Product Trade Name:

Bio-Rad VARIANT™ Express Glycohemoglobin Program

Common Name:

VARIANT Express

Classification Name:

Assay, Glycosylated Hemoglobin, 81LCP

Predicate Devices

1. VARIANT Total GHb Program (K941616)
2. Pierce Glycotest II GlyHb Assay Kit (K 895661)

The Bio-Rad VARIANT Express Glycohemoglobin Program is designed for use on the Bio-Rad VARIANT Express Instrument. The analytical system, consisting of instrument, software and reagent kit, provides an assay for the separation and percent determination of glycohemoglobin in whole blood.

The VARIANT Express Glycohemoglobin Program is for use on the fully automated VARIANT Express analyzer. The analytical system of instrument and reagent kit provides a means of measuring a mixture of hemoglobins, each formed by the non-enzymatic attachment of circulating blood glucose to a receptive amino acid site on the hemoglobin molecule (HbAo). Attachment of glucose to hemoglobin is achieved in a two step process: formation of an unstable aldimine (Schiff base) intermediate followed by production of a stable ketoamine linkage. Formation of the Schiff base intermediate is a reversible reaction and is influenced by short-term blood glucose fluctuations. In contrast, conversion of the Schiff base intermediate to the "ketoamine" products (Total GHb) is much slower and irreversible. The percentage of total glycated hemoglobin in whole blood is dependent upon the level of sustained blood glucose and is indicative of mean blood glucose over the lifetime of red blood cells (≈120 days). Thus, monitoring of total GHb levels has become a routine test for the long-term management of patients with diabetes mellitus.

To establish substantial equivalence to an existing device, and thus establish the safety and effectiveness of the Bio-Rad VARIANT Express Glycohemoglobin Program , the Bio-Rad VARIANT Express Glycohemoglobin Program has been compared to the Bio-Rad VARIANT Total GHb Program (K941616). A review of the intended use of each system shows them to be the same in that they both measure total glycosylated hemoglobin in a sample of whole blood using boronate affinity high performance liquid chromatography. The intended use of both the Bio-Rad VARIANT Express Glycohemoglobin Program and the VARIANT Total GHb Program is stated as:.... *for the separation and area percent determination of glycohemoglobin (GHb) in whole blood using boronate affinity high performance liquid chromatography (HPLC)* (see Appendix C and Appendix L).

The underlying technology of VARIANT Express Glycohemoglobin Program and the VARIANT Total GHb Program is the same. Both assay systems use boronate affinity gel chromatography as the separation mechanism; both assay systems use a direct dilution of whole blood in an aqueous medium for sample preparation; and both systems use visible detection at the same wavelength to monitor the hemoglobin.

The performance of the Bio-Rad VARIANT Express Glycohemoglobin Program was evaluated for precision, measuring range, and accuracy. The precision studies were done according to NCCLS Evaluation protocol, Vol. 12, No 4, EP5-T2, Appendix C, pp 31-39. Using this protocol, precision of the system was determined using a low, medium and high patient. The Within-run % CV for the low was 3.54%, for the Medium 2.90%, and for the High 2.30%. The Between-run % CV for the low was 3.97%, for the medium 4.47% and the high patient 3.55%. Total precision was 5.03% for the low, 4.70% for the medium patient and 3.67 for the high patient. The VARIANT Express Glycohemoglobin Program method meets the precision requirements of the National Glycohemoglobin Standardization Program (NGSP).

A correlation study, to determine accuracy of the Bio-Rad VARIANT Express Glycohemoglobin Program, was done against the Bio-Rad VARIANT Total GHb Program. The study followed NCCLS Document EP9-T. The "r^2" for the correlation was 0.9895.

When considering the similarities of the general characteristics of the two assays (Appendix C), the use of the same technology and the excellent correlation between the two methods, it can be concluded that the VARIANT Express Glycohemoglobin Program and the VARIANT Total GHb Program are substantially equivalent. Based on the establishment of substantial equivalence, the safety and effectiveness of the Bio-Rad VARIANT Express Glycohemoglobin Program is confirmed.

APPENDIX C

COMPARISON OF GENERAL CHARACTERISTICS

Comparison of General Characteristics of the VARIANT Express Glycohemoglobin Program to the VARIANT Total GHb Program.

Parameter	VARIANT Express Glycohemoglobin Program	VARIANT Total GHb Program
Analytes Measured/Reported	Total Glycohemoglobin	Total Glycohemoglobin
Analyte Reported (optional)	Standardized HbA1c	Standardized HbA1c
Calibration	2 point	1 point
Basic Principle	Affinity chromatography	Affinity chromatography
Measurement Type	Quantitative area percent	Quantitative area percent
Reagents	Analytical cartridge, pre-cartridge, elution buffers, hemolysis reagent, wash reagent, calibrators, whole blood primer	Analytical cartridge, elution buffers, hemolysis reagent, wash reagent, calibrators
Analysis Medium	Alkaline glycylglycine elution buffer 1, sorbitol/sodium citrate buffer 2, silica packed cartridge	Alkaline glycylglycine elution buffer 1, sorbitol/sodium citrate buffer 2, silica packed cartridge
Analysis Temperature	35°C	35°C
Instrumentation	VARIANT Express-Automated HPLC system for glycohemoglobin analysis.	VARIANT Hemoglobin Testing System- Automated HPLC system for hemoglobin analysis.
Sample Type	Whole blood	Whole blood
Sample Volume	5 µL	5 µL
Use of Controls	Two levels of control per run	Two levels of control per run

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

AUG - 6 1997

Mr. John W. Nelson
Manager, Regulatory Affairs
Clinical Systems Division
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4000 Alfred Nobel Drive
Hercules, CA 94547-1803

Re: K972609
VARIANT Express Glycohemoglobin Program
Regulatory Class: II
Product Code: LCB
Dated: July 11, 1997
Received: July 11, 1997

Dear Mr. Nelson:

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 (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

Statement of Intended Use

510(k) Number (If Known)

Device Name: Bio-Rad VARIANT™ Express Glycohemoglobin Program.

Indications for Use: The VARIANT Express Glycohemoglobin Program is intended for the separation and area percent determination of glycohemoglobin (GHb) in whole blood using boronate affinity high performance liquid chromatography (HPLC).

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)
Concurrence of CDHR, Office of Device Evaluation (ODE)

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