

3/22/99

510(k) SUMMARY

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92.

The assigned 510(k) number is: **K980737**

1. *Name of Submitter, Contact Person and Date Summary Prepared:*

Jimmy Wong
Nichols Institute Diagnostics
33051 Calle Aviador
San Juan Capistrano, California 92675
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Summary Prepared On: March 18, 1999

2. *Device Name:*

Trade/Proprietary Name: Nichols Advantage® Chemiluminescence Erythropoietin Immunoassay
Common/Usual Name: Erythropoietin Assay
Classification Name: Erythropoietin Assay

3. *Legally Marketed Equivalent Device Name:*

We are claiming substantial equivalence to the assay cleared in Nichols Institute Diagnostics' 510(k) K952559 for the Chemiluminescence Erythropoietin Immunoassay Kit.

4. *Description of the Device:*

The Nichols Advantage™ EPO assay is a two-site chemiluminescence assay. Total assay duration is 30 minutes at 37°C.

1st Incubation: 20 minutes at 37°C. Sample or control (200uL), biotinylated polyclonal antibody (40uL), acridinium labeled mouse monoclonal antibody (10uL) are pipetted into a reaction well on the cuvette strip. Each antibody binds to a separate and distinct antigenic site on EPO to form a sandwich complex.

2nd Incubation: 10 minutes at 37°C. Streptavidin coated magnetic particles (20uL) are added to the reaction mixture. After the 10 minute incubation, the sandwich complex is bound to the solid phase via the high affinity interaction of biotin and streptavidin. The reaction mixture is aspirated from the reaction well after the streptavidin magnetic particles are magnetically captured onto the surface of the reaction well wall.

Acridinium esters emit light upon treatment with hydrogen peroxide and an alkaline solution. The Trigger 1 solution contains hydrogen peroxide in dilute acid and Trigger 2 solution contains sodium hydroxide. The system automatically injects Trigger 1 and 2 into the reaction well which oxidizes the acridinium ester. The oxidized product is in an excited state. The subsequent return to ground state results in the emission of light which

is quantified in 2 seconds, and is expressed in relative light units (RLU) by the integrated system luminometer.

The amount of bound labeled antibody in RLU's is directly proportional to the concentration of EPO in the sample. Results are determined via a calibration curve which is instrument-specifically generated by 2-point calibration and a master curve provided via the reagent bar codes.

5. Intended Use of the Device

The Advantage Chemiluminescence Erythropoietin Immunoassay is intended for use with the Advantage Specialty System for the quantitative determination of erythropoietin concentrations in human serum as an adjunct in the diagnosis of anemia and polycythemia.

6. Comparison of technological characteristics With Predicate Device

The Advantage Chemiluminescence Erythropoietin (EPO) Immunoassay is substantially equivalent in intended use to results obtained using the predicate device. Both assays use a labeled antibody for the quantitative measurement of EPO in serum. The major difference in the assays is that the subject device uses streptavidin coated magnetic particle in the capture separation phase of the assay; whereas, the predicate device uses an avidin coated bead as the separation system.

7. Comparison of Performance Characteristics With Predicate Device

The Nichols Advantage™ EPO is substantially equivalent to other products in commercial distribution for similar use. The following tables compare the Nichols Advantage™ EPO with the predicate device, Nichols Chemiluminescence EPO kit.

Similarities:

- **Intended Use:** For the quantitative determination of erythropoietin levels in human serum as an adjunct in the diagnosis of anemia and polycythemia.
- Both assays use specific antibodies to EPO.
- Both assays use human serum for the test sample.
- The sensitivity of both assays are nearly the same, and both assays are standardized to the same WHO Standard (1st IS 87/684) for recombinant DNA derived erythropoietin.
- Recombinant EPO is used as standards in both assays.
- The upper end of the normal range is similar at the 95% confidence level.

Differences:

Feature	Nichols Advantage™ EPO Immunoassay	Nichols Institute Diagnostics Chemiluminescence EPO kit
Sample Size	200 uL	100 uL
Calibration	Full calibration curve every week with 2 point calibration every 4 hours.	Full standard curve with every assay run.
Solid Phase	Streptavidin coated magnetic particles.	Avidin coated bead.
Dynamic Range	5-700 mU/mL	1.4-1500 mU/mL
Incubation	Total of 30 minutes at 37°C	Total of 4 hours at room temperature (15-30°C)
Assay Counting	Automated on-board instrument	Semi-automated luminometer.
Assay Washing	Automated on-board instrument	Separate semi-automated wash instrument.

Performance Characteristics:

Feature	Nichols Advantage™ EPO (NCCLS Protocol)			Nichols Chemiluminescence EPO Assay kit.		
	Mean (mU/mL)	No of Reps.	%CV	Mean (mU/mL)	N	%CV
Precision	12.5	66	10.4	19.8	20	5.4
	92	66	3.3	152	20	3.2
	168	66	2.6	310	20	2.4
	502	66	4.5	544	20	2.7
Total Precision	12.5	66	13.6	21.8	20	9.7
	92	66	5.5	160	20	6.1
	168	66	3.8	294	20	5.3
	502	66	5.6	544	20	3.7
Recovery	87-111%			93-120%		
Parallelism	91-116%			84-108%		
High Dose Hook	7,500 mU/mL			50,000 mU/mL		
Specificity & Crossreactivity*: Human Transferrin @10 mg/mL Human α-2-Macroglobulin @ 8.3 mg/mL Human α-1-Acid Glycoprotein @8.3 mg/mL Human α-1-Antitrypsin @10 mg/mL	<0.001% <0.001% <0.001% <0.001%			<0.001% <0.001% <0.001% <0.001%		
Hemoglobin	no interference up to 500 mg/dL			no interference up to 25 mg/dL		
Triglycerides	no interference up to 3000 mg/dL			no interference up to 1000 mg/dL		
Unconjugated Bilirubin	no interference up to 20 mg/dL			no interference up to 100 mg/dL		
Albumin	no interference			no interference up to 5000 mg/dL		
Gamma Globulin	no interference			no interference up to 5000 mg/dL		
Method Comparison:	n = 88					
Range of Results	14.7 to 590 mU/mL			11.4 to 702 mU/mL		
Deming Linear Regression	$y = 0.736(x) + 10.9$					
Correlation (R)	0.960					

* Highest concentration tested with no interference.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

MAR 23 1999

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

Jimmy Wong
Manager, Clinical and Technical Affairs
Nichols Institute Diagnostics
33051 Calle Aviador
San Juan Capistrano, CA 92675

Re: K980737

Trade Name: Nichols Advantage® Chemiluminescence
Erythropoietin Immunoassay
Regulatory Class: III
Product Code: GGT
Dated: December 23, 1998
Received: December 28, 1998

Dear Mr. Wong:

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.

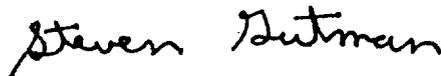
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Under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88), this device may require a CLIA complexity categorization. To determine if it does, you should contact the Centers for Disease Control and Prevention (CDC) at (770) 488-7655.

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/dsma/dsmamain.html>".

Sincerely yours,



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

4.0 Indications For Use Statement

INDICATIONS FOR USE STATEMENT

510(k) Number (if known): K980737

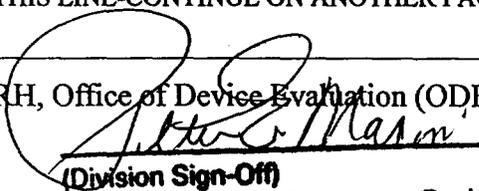
Device Name: Nichols Advantage™ Chemiluminescence Erythropoietin Immunoassay

Indications For Use:

The Nichols Advantage™ Chemiluminescence Erythropoietin Immunoassay is intended for use with the Nichols Advantage™ Specialty System for the quantitative determination of erythropoietin concentrations in human serum as an adjunct in the diagnosis of anemia and polycythemia.

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

Concurrence of CDRH, Office of Device Evaluation (ODE)


(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K980737

Prescription Use
(Per 21 CFR 801.109)

OR

Over-The-Counter Use
(Optional Format 1-2-96)