Dear Mr. Lauder:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and 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) that do not require approval of a premarket approval application (PMA). 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. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA’s issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act’s requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the
electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulations (21 CFR Parts 801 and 809), please contact the Division of Industry and Consumer Education at its toll-free number (800) 638 2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, “Misbranding by reference to premarket notification” (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH’s Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Industry and Consumer Education at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Kelly Oliner -S

For
Leonthena Carrington, MBA, MS, MT(ASCP)
Director
Division of Immunology and Hematology Devices
Office of In Vitro Diagnostics
and Radiological Health
Center for Devices and Radiological Health

Enclosure
510(k) Number (if known)

Device Name
Optilite Rheumatoid Factor Kit

Indications for Use (Describe)
The Optilite Rheumatoid Factor (RF) Kit is intended for the quantitative in vitro measurement of rheumatoid factor in serum using the Binding Site Optilite analyser. Measurement of rheumatoid factor may aid in the diagnosis of rheumatoid arthritis. This test should be used in conjunction with other laboratory and clinical findings.

Type of Use (Select one or both, as applicable)

- [x] Prescription Use (Part 21 CFR 801 Subpart D)
- [ ] Over-The-Counter Use (21 CFR 801 Subpart C)

CONTINUE ON A SEPARATE PAGE IF NEEDED.

This section applies only to requirements of the Paperwork Reduction Act of 1995.

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The burden time for this collection of information is estimated to average 79 hours per response, including the time to review instructions, search existing data sources, gather and maintain the data needed and complete and review the collection of information. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden, to:

Department of Health and Human Services
Food and Drug Administration
Office of Chief Information Officer
Paperwork Reduction Act (PRA) Staff
PRASstaff@fda.hhs.gov

“An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB number.”
Optilite Rheumatoid Factor Kit
510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY

Jon Lauder
Regulatory Affairs Specialist
The Binding Site Group Ltd.
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Edgbaston
Birmingham, West Midlands, B15 1QT, UK
Telephone: +44 (0)121 456 9500
Email: jon.lauder@bindingsite.co.uk or regulatory.submissions@bindingsite.co.uk

A. 510(k) Number:

K162263

B. Purpose for Submission:

New device

C. Measurand:

Rheumatoid Factor

D. Type of Test:

Quantitative immunoturbidimetry

E. Applicant:

The Binding Site

F. Proprietary and Established Names:

Optilite Rheumatoid Factor Kit

G. Regulatory Information:

1. Regulation section:
   21 CFR 866.5775, Rheumatoid factor immunological test system

2. Classification:
   Class II

3. Product code:
   DHR – system, test, rheumatoid factor

4. Panel:
   Immunology (82)
H. Intended use:

1. Intended use(s):

The Optilite Rheumatoid Factor (RF) Kit is intended for the quantitative in vitro measurement of rheumatoid factor in serum using the Binding Site Optilite analyser. Measurement of rheumatoid factor may aid in the diagnosis of rheumatoid arthritis. This test should be used in conjunction with other laboratory and clinical findings.

2. Indication(s) for use:

   Same as Intended use.

3. Special conditions for use statement(s):

   Prescription use only

4. Special instrument requirements:

   The Binding Site Optilite turbidimetric analyser (K110035)

I. Device Description:

The Optilite Rheumatoid Factor Kit comprises the following reagents:

**Reaction Buffer**: Containing Glycine Buffer pH 8.3, Sodium Chloride, Sodium Ethylenediamine tetra acetic acid disodium salt dehydrate, Bovine serum albumin, Sodium Azide 0.09% w/v

**Latex Reagent**: Containing Glycine Buffer pH 7.3, Sodium Chloride, Latex particle adsorbed human IgG, Sodium Azide 0.09% w/v.

**RF Controls**: Supplied at 2 levels, Low and High. Target values and ranges are supplied in the Quality Control certificate. Supplied ready for use.

**RF Calibrator**: Calibration has been carried out and value has been assigned using an immunoturbidimetric method standardised to the International Reference Preparation, WHO Standard 64/2. Supplied ready for use.

J. Substantial equivalence information:

1. **Predicate device name(s) and 510(k) number(s):**

   Rheumatoid Factor (RF) Kit for use on SPAPLUS; K160070
2. Comparison with predicate:

<table>
<thead>
<tr>
<th>Item</th>
<th>Test device</th>
<th>Predicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assay type</td>
<td>Quantitative</td>
<td>Same</td>
</tr>
<tr>
<td>Specimen Type</td>
<td>Serum</td>
<td>Same</td>
</tr>
<tr>
<td>Antibody</td>
<td>Human IgG anti-human-IgM</td>
<td>Same</td>
</tr>
<tr>
<td>Intended use</td>
<td>Turbidimetric in vitro quantification of rheumatoid factor</td>
<td>Same</td>
</tr>
<tr>
<td>Calibration</td>
<td>WHO 64/2</td>
<td>Same</td>
</tr>
<tr>
<td>Reference Interval</td>
<td>12.5 IU/mL</td>
<td>Same</td>
</tr>
<tr>
<td>Open Vial Stability</td>
<td>3 months</td>
<td>3 months</td>
</tr>
<tr>
<td>On-board stability</td>
<td>30 days</td>
<td>30 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Test device</th>
<th>Predicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>7 - 100 IU/mL (1+0)</td>
<td>10 - 104 IU/mL (1/1)</td>
</tr>
<tr>
<td></td>
<td>70 - 1000 IU/mL (1+9)</td>
<td>70 - 1040 IU/mL (1/100)</td>
</tr>
<tr>
<td>Instrument</td>
<td>Binding Site Optilite</td>
<td>Binding Site SPAPLUS</td>
</tr>
</tbody>
</table>

K. Standards and Guidance documents referenced:

CLSI EP17-A Protocols for Determination of Limits of Detection and Limits of Quantitation; Approved Guideline

L. Test Principle:

The determination of soluble antigen concentration by turbidimetric methods involves the reaction with specific antiserum to form insoluble complexes. When light is passed through the suspension formed a portion of the light is transmitted and focused onto a photodiode by an optical lens system. The amount of transmitted light is indirectly proportional to the specific protein concentration in the test sample. Concentrations are automatically calculated by reference to a calibration curve stored within the instrument.

M. Performance Characteristics (if/when applicable):

1. Analytical performance:
   a. Precision/Reproducibility:

The studies were based on CLSI EP5-A2, where 5 sample preparations were tested in 2 runs per day (each of the 2 runs in duplicate) over 21 days using 3 analysers. Acceptance criteria were total precision (%CV<10%), within-run precision (%CV<5%), between-run precision (%CV<8%), and between-day precision (%CV<8%). A summary of the results is shown below. All results are in IU/mL.
Results:

<table>
<thead>
<tr>
<th>Level</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>84</td>
<td>84</td>
<td>84</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td>Mean (IU/mL)</td>
<td>12.3</td>
<td>19.4</td>
<td>38.1</td>
<td>75.7</td>
<td>191</td>
</tr>
<tr>
<td>Within Run SD</td>
<td>0.3</td>
<td>0.13</td>
<td>0.22</td>
<td>1.26</td>
<td>2.79</td>
</tr>
<tr>
<td>%CV</td>
<td>2.5</td>
<td>0.7</td>
<td>0.6</td>
<td>1.7</td>
<td>1.5</td>
</tr>
<tr>
<td>Between run SD</td>
<td>0.26</td>
<td>0.29</td>
<td>0.5</td>
<td>0.95</td>
<td>2.82</td>
</tr>
<tr>
<td>%CV</td>
<td>2.2</td>
<td>1.5</td>
<td>1.3</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Between day SD</td>
<td>0.74</td>
<td>0.71</td>
<td>1.49</td>
<td>2.83</td>
<td>6.11</td>
</tr>
<tr>
<td>%CV</td>
<td>6</td>
<td>3.7</td>
<td>3.9</td>
<td>3.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Total SD</td>
<td>0.84</td>
<td>0.78</td>
<td>1.59</td>
<td>3.24</td>
<td>7.28</td>
</tr>
<tr>
<td>%CV</td>
<td>6.9</td>
<td>4</td>
<td>4.2</td>
<td>4.3</td>
<td>3.8</td>
</tr>
</tbody>
</table>

b. Linearity/assay reportable range:

The studies followed CLSI EP6-A, whereby linearity was assessed across the curve width at the standard sample dilution (1+0). The acceptance criteria were that the %CV for each sample should be ≤8% and the allowable nonlinearity was ±10% or 10% of the medical decision point.

A dilution series comprising a high pool and low pool was tested in 3 replicates.

Weighted Linear Regression analysis was performed by plotting the % High Pool against the observed concentration, from which a weighted linear fit was generated for each point in the dilution series. This was then compared with the observed result and the difference calculated. Observed nonlinearity was less than 10%, or 10% of the medical decision point.

c. Traceability, Stability, Expected values (controls, calibrators, or methods):

i) Traceability:

The calibration of the assay is traceable to the International Reference Preparation of Rheumatoid Arthritis Serum WHO 64/2.

ii) Kit Stability:

Real-time stability – Reagents are identical to those in the predicate device (K972220). Additional real time stability was therefore not assessed. The shelf life of the reagents is 12 months.

Open-vial stability - The RF Reagent, Calibrator and Controls can be stored, opened at 2-8°C for up to 3 months.

On-board stability – The RF Reagent can be stored on-board the Optilite Analyser for up to 30 days.


d. Detection limit:

The analytical sensitivity was determined in accordance with CLSI EP17-A. The Limit of Blank (LoB) was based on 60 determinations of a blank sample and was estimated as the 95% percentile of the distribution. The Limit of Detection (LoD) was calculated according to the equation LoB + 1.645 x SDs where SDs, the standard deviation, was based on 6 determinations of 4 samples with analyte levels near the lower limit of the reportable range. Total error at LoQ was within the maximum allowable total error.

The limit of quantitation (LoQ) for this assay is defined as the bottom of the measuring range, 7 IU/mL. The LoQ validation study was based on CLSI EP17-A Protocols for Determination of Limits of Detection and Limits of Quantitation.

e. Analytical specificity:

Interferences were assessed according to CLSI EP7-A2 by testing samples at different RF concentrations. Each sample was spiked with interfering substances and tested. For non-interference to be claimed, the mean results from the spiked samples must be within 10% of the mean of the control samples. The data demonstrated that the assay was not affected by the following substances at the concentrations given below.

Results:

<table>
<thead>
<tr>
<th>Interferent</th>
<th>Concentration</th>
<th>Interferent</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascorbic Acid</td>
<td>342 µmol/L</td>
<td>Acetylsalicylic Acid</td>
<td>3.63 mmol/L</td>
</tr>
<tr>
<td>Conjugated Bilirubin</td>
<td>200 mg/L</td>
<td>Penicillin</td>
<td>75 mg/L</td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>2.5 g/L</td>
<td>Caffeine</td>
<td>308 µmol/L</td>
</tr>
<tr>
<td>Intralipid</td>
<td>250 mg/dL</td>
<td>Prednisolone</td>
<td>100 µg/mL</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>500 mg/dL</td>
<td>Digoxin</td>
<td>7.8 nmol/L</td>
</tr>
<tr>
<td>Acetaminophen</td>
<td>1324 µmol/L</td>
<td>Cimetidine</td>
<td>79.2 µmol/L</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>2425 µmol/L</td>
<td>Theophylline</td>
<td>222 µmol/L</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>2 mmol</td>
<td>Phenytoin</td>
<td>198 µmol/L</td>
</tr>
</tbody>
</table>

f. Assay cut-off:

Not determined

2. Comparison studies:

a. Method comparison with predicate device:

103 samples were tested using the Optilite Kit and an alternative commercially available assay. Samples were tested in singlicate.

<table>
<thead>
<tr>
<th>Passing Bablok</th>
<th>Slope 95% CI</th>
<th>Intercept 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>y = 0.90x + 2.51 IU/mL</td>
<td>0.87 to 0.97</td>
<td>0.76 to 3.88</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pearson’s r</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.984</td>
</tr>
</tbody>
</table>
b. Matrix comparison:

None

3. Clinical studies:

   a. Clinical Sensitivity:
      None determined

   b. Clinical specificity:
      None determined

   c. Other clinical supportive data (when a. and b. are not applicable):
      Not applicable

4. Clinical cut-off:

   None determined

5. Expected values/Reference range:

   The reference range of <12.5 IU/mL was transferred from the predicate device.

N. Proposed Labelling:

   The labelling is sufficient and it satisfies the requirements of 21 CFR Part 809.10.

O. Conclusion:

   The submitted information in this premarket notification is complete and supports a substantial equivalence decision.