Biowaiver Application Form: Biopharmaceutics Classification System (BCS)

This application form is designed to facilitate information exchange between the Applicant and the Botswana Medicines Regulatory Authority (MRA) if the Applicant seeks to waive bioequivalence studies based on the Biopharmaceutics Classification System (BCS). For further information, please study the respective WHO biowaiver guidance documents. This form is not to be used if a biowaiver is requested for additional strength(s) of a submitted product(s), in which case a separate "Biowaiver Application Form: Additional Strengths" should be used.

General Instructions:

- Please review all the instructions thoroughly and carefully prior to completing the current Application Form.
- Provide as much detailed, accurate, and final information as possible.
- Please enter the data and information directly following the greyed areas.
- Please enclose the required documentation in full and state in the relevant sections of the Application Form the exact location (Annex number) of the appended documents. For example, in section 2.5 indicate in which Annex the Certificate of Analysis can be found.
- Please provide the document as an MS Word file.
- Do not paste snap-shots into the document.
- The appended electronic documents should be clearly identified in their file names, which should include the product name and Annex number.
- Before submitting the completed Application Form, kindly check that you have provided all requested information and enclosed all requested documents.
- Should you have any questions regarding this procedure, please contact the MRA via e-mail nmodutlwa@gov.bw or nkago@gov.bw.

The signed paper version of this Biowaiver Application Form together with Annexes (and their electronic copies on CD-ROM) should be included to the bioequivalence part of the submitted dossier and sent by surface mail to the following address:

Attention: Drugs Advisory Board
C/O Drugs Regulatory Unit
Ministry of Health
Private Bag 0038
Gaborone, Botswana
## Administrative data

1. **INN of active ingredient(s)**

   &lt;&lt; Please enter information here &gt;&gt;

2. **Dosage form and strength**

   &lt;&lt; Please enter information here &gt;&gt;

3. **Product MRA Reference number** *(if product dossier has been accepted for PQTm assessment)*

   &lt;&lt; Please enter information here &gt;&gt;

4. **Name of applicant and official address**

   &lt;&lt; Please enter information here &gt;&gt;

5. **Name of manufacturer of finished product and official address**

   &lt;&lt; Please enter information here &gt;&gt;

6. **Name and address of the laboratory or Contract Research Organisation(s) where the BCS-based biowaiver solubility and dissolution studies were conducted**

   &lt;&lt; Please enter information here &gt;&gt;
I, the undersigned, certify, that the information provided in this application and the attached documents is correct and true

Signed on behalf of

<company>

____________________ (Date)

________________________________________ (Name and title)
1. Justification for a BCS Biowaiver

1.1. Active Pharmaceutical Ingredient (API)
Please confirm that the proposed product contains the same active substance (e.g. salt, ester, ether, isomer) as the comparator.

<< Please enter information here >>

1.2. Therapeutic Index of the API
Please enclose a copy of the comparator product labelling and literature references employed to support that the drug does not exhibit a narrow therapeutic index for all authorised indications

<< Please enter information here >>

1.3. Pharmacokinetic properties of the API
Please enclose a copy of the literature references employed to document the PK properties (PK linearity or reasons for non-linearity).

<< Please enter information here >>

1.4. Dosage form
Please confirm that:
- the dosage form is an immediate release product for systemic action
- the posology is limited to oral administration
- the administration without water is not included in the proposed posology

<< Please enter information here >>

1.0 COMMENTS FROM REVIEW OF SECTION 1 – MRA USE ONLY
## 2. Solubility

(Completion of this section is not necessary if the API(s) are included on the list of biowaiver-eligible APIs in the WHO PQTm document *General notes on Biopharmaceutics Classification System (BCS)-based biowaiver applications.*)

### 2.1. Maximum therapeutic dose of the API

Please enclose a copy of the labelling of the comparator product to document the maximum single dose that can be administered in a single administration (e.g. two tablets together).

<< Please enter information here >>

### 2.2. Stability of the drug in the physiological pH range

Please discuss stability of the API in the pH range from 1.2 to 6.8 and in the gastrointestinal tract. Please discuss the ability of the analytical method to distinguish the API from its degradation products.

<< Please enter information here >>

### 2.3. Method of solubility determination

Please describe method and conditions (e.g. shake flask method at 37±1°C) Please indicate also location of the solubility study protocol.

<< Please enter information here >>

### 2.4. Solubility study dates

Please indicate dates of study protocol, study conductance and study report

<< Please enter information here >>

### 2.5. Analytical method validation

Please summarise the results and indicate location in the documentation.

<< Please enter information here >>
### 2.6. Results

Please indicate location of the solubility study report.
Please fill in the following table for the necessary pH values. Add as many rows as necessary to create a solubility – pH profile

<table>
<thead>
<tr>
<th>Theoretical pH</th>
<th>Observed pH</th>
<th>Adjusted pH</th>
<th>Individual concentration at saturation (Cs) values</th>
<th>Cs (mean and CV(%) )</th>
<th>Amount that can be dissolved in 250 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH 1.2</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td></td>
</tr>
<tr>
<td>Intermediate pHs</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td></td>
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<tr>
<td>pH 4.5</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
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<tr>
<td>Intermediate pHs</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td></td>
</tr>
<tr>
<td>pH 6.8</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td></td>
</tr>
<tr>
<td>Other intermediate pH values (e.g. pKa, pKa-1, pKa+1)</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td>Experiment 1 Experiment 2 Experiment 3</td>
<td></td>
</tr>
</tbody>
</table>

### 2.7. Plot the Solubility – pH profile

Please attach the plot of the pH-solubility profile based on the above data

<< Please enter information here >>

### 2.0 COMMENTS FROM REVIEW OF SECTION 2 – MRA USE ONLY
### 3. Absorption / Permeability

(Completion of this section is not necessary if the API(s) are included on the list of biowaiver-eligible APIs in the WHO PQTm document *General notes on Biopharmaceutics Classification System (BCS)-based biowaiver applications.*)

<table>
<thead>
<tr>
<th>3.1. Human mass balance studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarise results of all studies found in the literature.</td>
</tr>
<tr>
<td>Please enclose a copy of the references describing human mass balance studies of the API.</td>
</tr>
<tr>
<td>&lt;&lt; Please enter information here &gt;&gt;</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3.2. Human absolute bioavailability studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarise results of all studies found in the literature.</td>
</tr>
<tr>
<td>Please enclose a copy of the references describing human absolute bioavailability of the API.</td>
</tr>
<tr>
<td>&lt;&lt; Please enter information here &gt;&gt;</td>
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</tbody>
</table>

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<tr>
<th>3.3. Supportive studies</th>
</tr>
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<tbody>
<tr>
<td>Summarise results of all studies found in the literature regarding in vivo or in situ intestinal perfusion animal models or in vitro permeation across a monolayer of cultured epithelial cells (e.g. Caco-2) with a positive and negative control.</td>
</tr>
<tr>
<td>Please enclose a copy of the references.</td>
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<th>3.0 COMMENTS FROM REVIEW OF SECTION 3 – MRA USE ONLY</th>
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</thead>
</table>
4. Test product

4.1 Tabulation of the composition of the formulation(s) proposed for marketing and those used for comparative dissolution studies

- Please state the location of the master formulae in the quality part of the submission.
- Tabulate the composition of each product strength using the table below.
- For solid oral dosage forms the table should contain only the ingredients in tablet core or contents of a capsule. A copy of the table should be filled in for the film coating/hard capsule, if any.
- Biowaiver batches should be at least of pilot scale (10% of production scale or 100,000 capsules or tablets whichever is greater) and manufacturing method should be the same as for production scale.

**Please note:** If the formulation proposed for marketing and those used for comparative dissolution studies are not identical, copies of this table should be filled in for each formulation with clear identification in which study the respective formulation was used.

<table>
<thead>
<tr>
<th>Composition of the batches used for comparative dissolution studies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Batch number</strong></td>
</tr>
<tr>
<td><strong>Batch size (number of unit doses)</strong></td>
</tr>
<tr>
<td><strong>Date of manufacture</strong></td>
</tr>
<tr>
<td><strong>Comments, if any</strong></td>
</tr>
</tbody>
</table>

Comparison of unit dose compositions and of clinical FPP batches (duplicate this table for each strength, if compositions are different)

<table>
<thead>
<tr>
<th>Ingredients (Quality standard)</th>
<th>Unit dose (mg)</th>
<th>Unit dose (%)</th>
<th>Biobatch (kg)</th>
<th>Biobatch (%)</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

Equivalence of the compositions or justified differences

4.2 Potency (measured content) of test product as a percentage of label claim as per validated assay method

This information should be cross-referenced to the location of the Certificate of Analysis (CoA) in this biowaiver submission.

<< Please enter information here >>

4.0 COMMENTS FROM REVIEW OF SECTION 4 – MRA USE ONLY
5. Comparator product

5.1. Comparator product
Please indicate location in the documentation of the following documents that should be enclosed:
A copy of product labelling (summary of product characteristics), as authorized in country of purchase, and
translation into English, if appropriate.
A copy of the comparator product carton outer box. The name of the product, name and address of the
manufacturer, batch number, and expiry date should be clearly visible on the labelling.
This information should be cross-referenced to the location of the Certificate of Analysis (CoA) in this
biowaiver submission.

<< Please enter information here >>

5.2. Name and manufacturer of the comparator product and official address

<< Please enter information here >>

5.3. Qualitative (and quantitative, if available) information on the composition of the comparator product
Please tabulate the composition of the comparator product based on available information and state the
source of this information.

<table>
<thead>
<tr>
<th>Composition of the comparator product used in dissolution studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batch number</td>
</tr>
<tr>
<td>Ingredients</td>
</tr>
</tbody>
</table>

5.4. Identify the source of the comparator product (where it was purchased), the method of shipment, and storage conditions of the comparator product from the time of purchase until completion of the comparative dissolution studies.
Please attach relevant copies of the following documents proving the stated conditions:
A copy of the invoice from the distributor or company from which the comparator product was purchased.
The address of the distributor must be clearly visible on the invoice.
Documentation verifying the method of shipment and storage conditions of the comparator product from the
time of purchase to the time of study initiation.
5.5. Potency (measured content) of the comparator product as a percentage of label claim, as measured by the same laboratory under the same conditions as the test product.
This information should be cross-referenced to the location of the Certificate of Analysis (CoA) in this biowaiver submission.

5.0 COMMENTS FROM REVIEW OF SECTION 5 – MRA USE ONLY
6. Comparison of test and comparator formulations

6.1. Identify any excipients present in either product that are known to impact *in vivo* absorption processes
A literature-based summary of the mechanism by which these effects are known to occur should be included and relevant full discussion enclosed, if applicable.

<< Please enter information here >>

6.2. Identify all qualitative (and quantitative, if available) differences between the compositions of the test and comparator products
The data obtained and methods used for the determination of the quantitative composition of the comparator product as required by the guidance documents should be summarized here for assessment.

<< Please enter information here >>

6.3. Provide a detailed comment on the impact of any differences between the compositions of the test and comparator products with respect to drug release and *in vivo* absorption

<< Please enter information here >>

6.0 COMMENTS FROM REVIEW OF SECTION 6 – MRA USE ONLY
7. Comparative in vitro dissolution

<table>
<thead>
<tr>
<th>7.1. Comparative in vitro dissolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information regarding the comparative dissolution studies should be included below to provide adequate evidence supporting the biowaiver request. Comparative dissolution data will be reviewed during the assessment of the Quality part of the dossier.</td>
</tr>
<tr>
<td>Please state the location of:</td>
</tr>
<tr>
<td>• the dissolution study protocol(s) in this biowaiver application</td>
</tr>
<tr>
<td>• the dissolution study report(s) in this biowaiver application</td>
</tr>
<tr>
<td>• the analytical method validation report in this biowaiver application</td>
</tr>
</tbody>
</table>

<< Please enter information here >>

<table>
<thead>
<tr>
<th>7.2. Dissolution study dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please indicate dates of study protocol, study conductance and study report</td>
</tr>
</tbody>
</table>

<< Please enter information here >>

<table>
<thead>
<tr>
<th>7.3. Summary of the dissolution conditions and method described in the study report(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary provided below should include the composition, temperature, volume, and method of de-aeration of the dissolution media, the type of apparatus employed, the agitation speed(s) employed, the number of units employed, the method of sample collection including sampling times, sample handling, filtration and storage. Deviations from the sampling protocol should also be reported.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7.3.1. Dissolution media: Composition, temperature, volume, and method of de-aeration</th>
</tr>
</thead>
</table>

<< Please enter information here >>

<table>
<thead>
<tr>
<th>7.3.2. Type of apparatus and agitation speed(s) employed</th>
</tr>
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</table>

<< Please enter information here >>

<table>
<thead>
<tr>
<th>7.3.3. Number of units employed</th>
</tr>
</thead>
</table>

<< Please enter information here >>
7.3.4. Sample collection: method of collection, sampling times, sample handling, filtration and storage

<< Please enter information here >>

7.3.5. Deviations from sampling protocol

<< Please enter information here >>

7.4. Summarize the results of the dissolution study(s)
Please provide a tabulated summary of individual and mean results with %CV, graphic summary, and any calculations used to determine the similarity of profiles for each set of experimental conditions.

<< Please enter information here >>

7.5. Summarize conclusions taken from dissolution study(s)
Please provide a summary statement of the studies performed.

<< Please enter information here >>

7.6. Dissolution specifications
Please provide proposed dissolution specifications and discuss them in relation to the results obtained in the BCS biowaiver.

<< Please enter information here >>

7.0 COMMENTS FROM REVIEW OF SECTION 7 – MRA USE ONLY
## 8. Quality assurance

### 8.1. Internal quality assurance methods
Please state location in this biowaiver application where internal quality assurance methods and results are described for each of the study sites.

<< Please enter information here >>

### 8.2. Auditing and inspections
Provide a list of all auditing reports of the study, and of recent inspections of study sites by regulatory agencies. State locations in this biowaiver application of the respective reports for each of the study sites e.g., analytical laboratory, laboratory where dissolution studies were performed.

<< Please enter information here >>

### 8.0 COMMENTS FROM REVIEW OF SECTION 8 – MRA USE ONLY

### CONCLUSIONS AND RECOMMENDATIONS – MRA USE ONLY