

**CENTER FOR DRUG EVALUATION AND
RESEARCH**

APPLICATION NUMBER:

202497Orig1s000

PROPRIETARY NAME REVIEW(S)

**Department of Health and Human Services
Public Health Service
Food and Drug Administration
Center for Drug Evaluation and Research
Office of Surveillance and Epidemiology
Office of Medication Error Prevention and Risk Management**

Proprietary Name Review--Final

Date: June 20, 2012

Reviewer: Jibril Abdus-Samad, PharmD
Division of Medication Error Prevention and Analysis

Team Leader: Todd Bridges, RPh
Division of Medication Error Prevention and Analysis

Drug Name and Strength: Marqibo (Vincristine Sulfate Liposome Injection)
5 mg/31 mL

Application Type/Number: NDA 202497

Applicant: Talon Therapeutics, Inc.

OSE RCM #: 2012-1062

*** This document contains proprietary and confidential information that should not be released to the public.***

CONTENTS

1	INTRODUCTION	3
2	METHODS AND DISCUSSION.....	3
3	CONCLUSIONS	3
4	REFERENCES	4

1 INTRODUCTION

This re-assessment of the proposed proprietary name, Marqibo, is written in response to the anticipated approval of this NDA 202497 within 90 days from the date of this review. DMEPA found the proposed name, *Marqibo*, acceptable in OSE Reviews 2008-1983 dated January 4, 2010 under IND 059056 and 2011-3507 dated December 15, 2011 during this NDA review cycle.

2 METHODS AND DISCUSSION

For re-assessments of proposed proprietary names, DMEPA searches a standard set of databases and information sources (see section 4) to identify names with orthographic and phonetic similarity to the proposed name that have been approved since the previous OSE proprietary name review. For this review we used the same search criteria described in OSE Review 2011-3507. We note that none of the proposed product characteristics were altered. However, we evaluated the previously identified names of concern considering any lessons learned from recent post-marketing experience, which may have altered our previous conclusion regarding the acceptability of the proposed proprietary name. The searches of the databases yielded three new names (Makena, ^{(b) (4)} Synribo^{***}) thought to look or sound similar to Marqibo and represent a potential source of drug name confusion. Failure Mode and Effects Analysis was applied to determine if the proposed proprietary name could potentially be confused with Marqibo and lead to medication errors. This analysis determined that the name similarity between Marqibo and the identified names was unlikely to result in medication error for the reasons presented in Appendix A.

Additionally, DMEPA searched the USAN stem list to determine if the name contains any USAN stems as of the last USAN updates. The Safety Evaluator did not identify any United States Adopted Names (USAN) stems in the proposed proprietary name, as of June 8, 2012. The Office of Prescription Drug Promotion re-reviewed the proposed name on May 10, 2012 and had no concerns regarding the proposed name from a promotional perspective.

3 CONCLUSIONS

The re-evaluation of the proposed proprietary name, Marqibo, did not identify any vulnerabilities that would result in medication errors with any additional names noted in this review. Thus, DMEPA has no objection to the proprietary name, Marqibo, for this product at this time.

DMEPA considers this a final review; however, if approval of the NDA is delayed beyond 90 days from the date of this review, the Division of Hematology Products should notify DMEPA because the proprietary name must be re-reviewed prior to the new approval date.

If you have further questions or need clarifications, please contact Sue Kang, OSE project manager, at 301-796-4216.

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4 REFERENCES

1. *OSE Review*

Abdus-Samad, Jibril. OSE Review 2011-3507: Proprietary Name Review for Marqibo, December 15, 2011

Oleszczuk, Zachary. OSE Review 2008-1983: Proprietary Name Review for Marqibo, January 4, 2010.

2. *Drugs@FDA* (<http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm>)

Drugs@FDA contains most of the drug products approved since 1939. The majority of labels, approval letters, reviews, and other information are available for drug products approved from 1998 to the present. Drugs@FDA contains official information about FDA approved [brand name](#), [generic drugs](#), [therapeutic biological products](#), [prescription](#) and [over-the-counter](#) human drugs and [discontinued drugs](#) and “[Chemical Type 6](#)” approvals.

3. *USAN Stems* (<http://www.ama-assn.org/ama/pub/physician-resources/medical-science/united-states-adopted-names-council/naming-guidelines/approved-stems.page>)

USAN Stems List contains all the recognized USAN stems.

4. *Division of Medication Error Prevention and Analysis Proprietary Name Consultation Request*

Compiled list of proposed proprietary names submitted to the Division of Medication Error Prevention and Analysis for review. The list is generated on a weekly basis from the Access database/tracking system.

Appendix A: Risk of medication errors due to product confusion minimized by dissimilarity of the names or use in clinical practice for the reasons described.

<p>Proposed name: Marqibo</p> <p>Dosage Form: Injection</p> <p>Strength: 5 mg/31 mL</p> <p>Usual Dose: 1.5 mg/m² to 2.25 mg/m² intravenously over 60 minutes every 7 days; Dose range 2 mg to 5.5 mg for BSA (1.4 m² to 2.5 m²)</p>	<p>Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion</p> <p>Causes (could be multiple)</p>	<p>Prevention of Failure Mode</p> <p>In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names</p>
<p>Makena (Hydroxyprogesterone Caproate)</p> <p>1250 mg/5 mL injection</p> <p>Usual Dose: 250 mg intramuscularly once weekly</p>	<p>Phonetic similarity</p> <ul style="list-style-type: none"> - Both names contain 3 syllables (Ma-ke-na vs. Mar-qi-bo) - Both names share 2 syllables that sound similar ('Ma-ke-' vs. 'Mar-qi-') <p>Product Characteristics differences</p> <ul style="list-style-type: none"> - Numerically similar dose: 2.5 mg vs. 250 mg - Frequency of administration: weekly 	<p>Phonetic differences</p> <ul style="list-style-type: none"> - The last syllable are sound differently ('-na' vs. '-bo') <p>Product Characteristics differences</p> <ul style="list-style-type: none"> - Prescriber population: Obstetricians/Gynecologist vs. Hematologist/Oncologist <p>Context of use</p> <ul style="list-style-type: none"> - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order. - It is unlikely that Marqibo, a chemotherapeutic product, will be prescribed via a verbal order.

<p>Proposed name: Marqibo</p> <p>Dosage Form: Injection</p> <p>Strength: 5 mg/31 mL</p> <p>Usual Dose: 1.5 mg/m² to 2.25 mg/m² intravenously over 60 minutes every 7 days; Dose range 2 mg to 5.5 mg for BSA (1.4 m² to 2.5 m²)</p>	<p>Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion</p> <p>Causes (could be multiple)</p>	<p>Prevention of Failure Mode</p> <p>In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names</p>
(b) (4)		

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<p>Proposed name: Marqibo</p> <p>Dosage Form: Injection</p> <p>Strength: 5 mg/31 mL</p> <p>Usual Dose: 1.5 mg/m² to 2.25 mg/m² intravenously over 60 minutes every 7 days; Dose range 2 mg to 5.5 mg for BSA (1.4 m² to 2.5 m²)</p>	<p>Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion</p> <p>Causes (could be multiple)</p>	<p>Prevention of Failure Mode</p> <p>In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names</p>
<p>Synribo^{***} (Omacetaxine Mepesuccinate)</p> <p>3.5 mg/vial for injection</p> <p>Usual Dose: 1.25 mg/m² subcutaneously twice daily for 7 or 14 days every 28 days</p> <p>(b) (4)</p>	<p>Orthographic similarity</p> <ul style="list-style-type: none"> - Both names share identical letters at the end ('-ibo') <p>Product Characteristics differences</p> <ul style="list-style-type: none"> - Overlapping dose: 2 mg to 3 mg - Prescriber population: Hematologist/Oncologist 	<p>Orthographic differences</p> <ul style="list-style-type: none"> - The beginning letters of the names differ ('Syn-' and 'Marq-') <p>Product Characteristics differences</p> <ul style="list-style-type: none"> - Administration: a medication order for Marqibo will likely include the 60 minute infusion rate vs. Synribo^{***} which will be subcutaneous - Frequency: every 7 days vs. twice daily every 28 days

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/s/

JIBRIL ABDUS-SAMAD
06/20/2012

TODD D BRIDGES
06/20/2012

**Department of Health and Human Services
Public Health Service
Food and Drug Administration
Center for Drug Evaluation and Research
Office of Surveillance and Epidemiology
Office of Medication Error Prevention and Risk Management**

Proprietary Name Review

Date: December 15, 2011

Reviewer: Jibril Abdus-Samad, PharmD
Division of Medication Error Prevention and
Analysis

Team Leader: Todd Bridges, RPh
Division of Medication Error Prevention and
Analysis

Division Director: Carol Holquist, RPh
Division of Medication Error Prevention and
Analysis

Drug Name and Strength: Marqibo (Kit for Vincristine Sulfate Liposomes
Injection)
0.16 mg/mL

Application Type/Number: NDA 202497

Applicant: Talon Therapeutics

OSE RCM #: 2011-3507

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CONTENTS

1	INTRODUCTION.....	1
1.1	Regulatory History.....	1
1.2	Product Information.....	1
2	RESULTS.....	2
2.1	Promotional Assessment.....	2
2.2	Safety Assessment.....	2
3	CONCLUSIONS.....	4
3.1	Comments to the Applicant.....	5
4	REFERENCES.....	6
	APPENDICES.....	9

1 INTRODUCTION

This review evaluates the proposed proprietary name, Marqibo, from a safety and promotional perspective. The sources and methods used to evaluate the proposed name are outlined in the reference section and Appendix A respectively.

1.1 REGULATORY HISTORY

The proposed proprietary name, Marqibo, was found acceptable by DMEPA in OSE Review 2008-1983, dated January 4, 2010 under IND 059056. Additionally, as a follow-up to the PreNDA meeting, DMEPA provided comments regarding safety concerns for the use of Marqibo in OSE Review 2010-806, dated August 26, 2010. The comments were sent to the Applicant on December 14, 2011. DMEPA awaits response to the comments and will address the Applicant's response in a separate review. The Applicant submitted a proprietary name request on September 20, 2011 which is the topic of this review.

1.2 PRODUCT INFORMATION

The following product information is provided in the September 20, 2011 proprietary name submission.

- Established Name: Kit for Vincristine Sulfate Liposomes Injection
- Indication of Use: for the treatment of adult patients with Philadelphia Chromosome-negative acute lymphoblastic leukemia in second or greater relapse or whose disease has progressed following two or more treatment lines of anti-leukemia therapy.
- Route of administration: Intravenous
- Dosage form: Injection
- Dose: 2.25 mg/m² intravenously over 60 minutes every 7 days
- How Supplied: The Marqibo® Kit for the Preparation of Vincristine Sulfate Liposomes Injection is composed of:
 - Vincristine Sulfate Injection, USP, 5 mg/5 mL (1 mg/mL)
 - Sphingomyelin/Cholesterol Liposomes Injection, 103 mg/mL
 - Sodium Phosphate Injection, 355 mg/25 mL (14.2 mg/mL)
 - The three component vials are packaged in a single Marqibo Kit that includes the Marqibo Package Insert Label, Flotation Ring, Overlabel for Sodium Phosphate Injection vial containing constituted Marqibo (Vincristine sulfate liposome injection, 0.16 mg/mL), and Infusion Bag Label as the drug product. The Marqibo (Vincristine sulfate liposome injection, 0.16 mg/mL) is compounded in accordance with the Package Insert Label at the dispensing pharmacy.
- Storage: Refrigerate at 2°C to 8°C – Do Not Freeze

- Container and Closure Systems:
 - Vincristine Sulfate Injection, USP: 5 mL glass vial
 - Sphingomyelin/Cholesterol Liposomes Injection: 3 mL glass vial
 - Sodium Phosphate Injection: 30 mL glass vial

Additionally, the insert labeling suggests the following:

- Pharmacy-supplied items
 - Water bath for constitution
 - Calibrated thermometer (0°C to 100°C)
 - Calibrated electronic timer
 - Vented needle or other suitable device equipped with a 0.2 micron filter
 - 1 mL or 3 mL sterile syringe with needle
 - 5 mL sterile syringe with needle

2 RESULTS

The following sections provide the information obtained and considered in the evaluation of the proposed proprietary name.

2.1 PROMOTIONAL ASSESSMENT

The Office of Prescription Drug Promotion determined the proposed name is acceptable from a promotional perspective. DMEPA and the Division of Hematology Products (DHP) concurred with the findings of OPDP's promotional assessment of the proposed name.

2.2 SAFETY ASSESSMENT

The following aspects of the name were considered in the overall evaluation.

2.2.1 United States Adopted Names (USAN) SEARCH

On November 18, 2011 the United States Adopted Name (USAN) stem search, identified that a USAN stem is not present in the proposed proprietary name.

2.2.2 Components of the Proposed Proprietary Name

This proprietary name comprised of a single word that does not contain any components such as a modifier, route of administration, or dosage form that is misleading or can contribute to medication error. The Applicant notes in their submission that the derivation of the proprietary name is unknown.

2.2.3 FDA Name Simulation Studies

Thirty-three practitioners participated in DMEPA's prescription studies. One interpretation did look and sound similar to the currently marketed product Marezine, which was identified by FDA (see Table 1). Our evaluation of this name can be found in

Appendix F. The most common misinterpretation in the written studies was the lowercase letter ‘g’ for the lowercase letter ‘q’. The most common misinterpretation in the verbal study was the letter ‘k’ for the letter ‘q’. See Appendix C for the complete listing of interpretations from the verbal and written prescription studies.

2.2.4 Comments from Other Review Disciplines

In response to the OSE, November 20, 2011 e-mail, DHP did not forward any comments or issues relating to the proposed name at the initial phase of the proprietary name review.

2.2.6 Failure Mode and Effects Analysis of Similar Names

Appendix B lists possible orthographic and phonetic misinterpretations of the letters appearing in the proposed proprietary name, Marqibo. Table 1 lists the names with orthographic, phonetic, or spelling similarity to the proposed proprietary name, Marqibo, identified by the primary reviewer, the Expert Panel Discussion (EPD), and other review disciplines. Table 1 also includes the names identified from the FDA Prescription Simulation.

Table 1: Collective List of Potentially Similar Names (DMEPA, EPD, Other Disciplines, FDA Name Simulation Studies, and External Name Study if applicable)

Look Similar		Sound Similar		Look and Sound Similar	
Name	Source	Name	Source	Name	Source
Macrobid	FDA	none found		Marqibo***	FDA
Mafenide	FDA				
Mag-Oxide	FDA				
Marcaine	FDA				
Marezine	FDA				
Margesic	FDA				
Margosa	FDA				
Marinol	FDA				
Marplan	FDA				
Maxzide	FDA				
(b) (4)	FDA				
Meridia	FDA				
Miradon	FDA				
Morgel	FDA				
Morgidox	FDA				
Morphine	FDA				

Look Similar		Sound Similar		Look and Sound Similar	
<i>Name</i>	<i>Source</i>	<i>Name</i>	<i>Source</i>	<i>Name</i>	<i>Source</i>
Morphine Sulfate	FDA				
Mozobil	FDA				
Norgesic	FDA				
Nucynta	FDA				
Nucynta ER	FDA				
Herceptin	FDA				
Horizant	FDA				
(b) (4)	FDA				
Miralax	FDA				
Norquest Fe	FDA				
Nuvigil	FDA				

Our analysis of the 28 names contained in Table 1 considered the information obtained in the previous sections along with their product characteristics. We determined 28 names will not pose a risk for confusion as described in Appendix E through F.

2.2.7 Communication of DMEPA’s Final Decision to Other Disciplines

DMEPA communicated our findings to the DHP via e-mail on December 8, 2011. At that time we also requested additional information or concerns that could inform our review. Per e-mail correspondence from DHP on December 15, 2011, they stated no issues with the proposed proprietary name, Marqibo.

3 CONCLUSIONS

The proposed proprietary name is acceptable from both a promotional and safety perspective.

The proposed proprietary name, Marqibo, must be re-reviewed 90 days before approval of the NDA.

If you have further questions or need clarifications, please contact Sue Kang, OSE project manager, at 301-796-4216.

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3.1 COMMENTS TO THE APPLICANT

We have completed our review of the proposed proprietary name, Marqibo, and have concluded that this name is acceptable. However, if any of the proposed product characteristics as stated in your September 20, 2011 submission are altered, DMEPA rescinds this finding and the name must be resubmitted for review. Additionally, this proprietary name must be re-evaluated 90 days prior to the approval of the application. The conclusions upon re-review are subject to change.

4 REFERENCES

1. ***Micromedex Integrated Index*** (<http://csi.micromedex.com>)

Micromedex contains a variety of databases covering pharmacology, therapeutics, toxicology and diagnostics.

2. ***Phonetic and Orthographic Computer Analysis (POCA)***

POCA is a database which was created for the Division of Medication Error Prevention and Analysis, FDA. As part of the name similarity assessment, proposed names are evaluated via a phonetic/orthographic algorithm. The proposed proprietary name is converted into its phonemic representation before it runs through the phonetic algorithm. Likewise, an orthographic algorithm exists which operates in a similar fashion.

3. ***Drug Facts and Comparisons, online version, St. Louis, MO***
(<http://factsandcomparisons.com>)

Drug Facts and Comparisons is a compendium organized by therapeutic course; it contains monographs on prescription and OTC drugs, with charts comparing similar products. This database also lists the orphan drugs.

4. ***FDA Document Archiving, Reporting & Regulatory Tracking System [DARRTS]***

DARRTS is a government database used to organize Applicant and Sponsor submissions as well as to store and organize assignments, reviews, and communications from the review divisions.

5. ***Division of Medication Errors Prevention and Analysis proprietary name consultation requests***

This is a list of proposed and pending names that is generated by the Division of Medication Error Prevention and Analysis from the Access database/tracking system.

6. ***Drugs@FDA*** (<http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm>)

Drugs@FDA contains most of the drug products approved since 1939. The majority of labels, approval letters, reviews, and other information are available for drug products approved from 1998 to the present. Drugs@FDA contains official information about FDA approved brand name, generic drugs, therapeutic biological products, prescription and over-the-counter human drugs and discontinued drugs and “Chemical Type 6” approvals.

7. ***U.S. Patent and Trademark Office*** (<http://www.uspto.gov>)

USPTO provides information regarding patent and trademarks.

8. ***Clinical Pharmacology Online*** (www.clinicalpharmacology-ip.com)

Clinical Pharmacology contains full monographs for the most common drugs in clinical use, plus mini monographs covering investigational, less common,

combination, nutraceutical and nutritional products. It also provides a keyword search engine.

9. Data provided by Thomson & Thomson's SAEGIS™ Online Service, available at (www.thomson-thomson.com)

The Pharma In-Use Search database contains over 400,000 unique pharmaceutical trademarks and trade names that are used in about 50 countries worldwide. The data is provided under license by IMS HEALTH.

10. Natural Medicines Comprehensive Databases (www.naturaldatabase.com)

Natural Medicines contains up-to-date clinical data on the natural medicines, herbal medicines, and dietary supplements used in the western world.

11. Access Medicine (www.accessmedicine.com)

Access Medicine® from McGraw-Hill contains full-text information from approximately 60 titles; it includes tables and references. Among the titles are: Harrison's Principles of Internal Medicine, Basic & Clinical Pharmacology, and Goodman and Gilman's The Pharmacologic Basis of Therapeutics.

12. USAN Stems (<http://www.ama-assn.org/ama/pub/about-ama/our-people/coalitions-consortiums/united-states-adopted-names-council/naming-guidelines/approved-stems.shtml>)

USAN Stems List contains all the recognized USAN stems.

13. Red Book Pharmacy's Fundamental Reference

Red Book contains prices and product information for prescription, over-the-counter drugs, medical devices, and accessories.

14. Lexi-Comp (www.lexi.com)

Lexi-Comp is a web-based searchable version of the Drug Information Handbook.

15. Medical Abbreviations Book

Medical Abbreviations Book contains commonly used medical abbreviations and their definitions.

16. CVS/Pharmacy (www.CVS.com)

This database contains commonly used over the counter products not usually identified in other databases.

17. Walgreens (www.walgreens.com)

This database contains commonly used over the counter products not usually identified in other databases.

18. *Rx List (www.rxlist.com)*

RxList is an online medical resource dedicated to offering detailed and current pharmaceutical information on brand and generic drugs.

19. *Dogpile (www.dogpile.com)*

Dogpile is a [Metasearch](#) engine that searches multiple search engines including Google, Yahoo! and Bing, and returns the most relevant results to the search.

20. *OSE Reviews*

Abate, Richard. OSE Review 2010-806: Medication Error Review for Marqibo, August 26, 2010.

Oleszczuk, Zachary. OSE Review 2008-1983: Proprietary Name Review for Marqibo, January 4, 2010.

APPENDICES

Appendix A

FDA's Proprietary Name Risk Assessment considers the promotional and safety aspects of a proposed proprietary name. The promotional review of the proposed name is conducted by OPDP. OPDP evaluates proposed proprietary names to determine if they are overly fanciful, so as to misleadingly imply unique effectiveness or composition, as well as to assess whether they contribute to overstatement of product efficacy, minimization of risk, broadening of product indications, or making of unsubstantiated superiority claims. OPDP provides their opinion to DMEPA for consideration in the overall acceptability of the proposed proprietary name.

The safety assessment is conducted by DMEPA. DMEPA staff search a standard set of databases and information sources to identify names that are similar in pronunciation, spelling, and orthographically similar when scripted to the proposed proprietary name. Additionally, we consider inclusion of USAN stems or other characteristics that when incorporated into a proprietary name may cause or contribute to medication errors (i.e., dosing interval, dosage form/route of administration, medical or product name abbreviations, names that include or suggest the composition of the drug product, etc.). DMEPA defines a medication error as any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer.¹

Following the preliminary screening of the proposed proprietary name, DMEPA gathers to discuss their professional opinions on the safety of the proposed proprietary name. This meeting is commonly referred to the Center for Drug Evaluation and Research (CDER) Expert Panel discussion. DMEPA also considers other aspects of the name that may be misleading from a safety perspective. DMEPA staff conducts a prescription simulation studies using FDA health care professionals. When provided, DMEPA considers external proprietary name studies conducted by or for the Applicant/Sponsor and incorporates the findings of these studies into the overall risk assessment.

The DMEPA primary reviewer assigned to evaluate the proposed proprietary name is responsible for considering the collective findings, and provides an overall risk assessment of the proposed proprietary name. DMEPA bases the overall risk assessment on the findings of a Failure Mode and Effects Analysis (FMEA) of the proprietary name and misleading nature of the proposed proprietary name with a focus on the avoidance of medication errors.

DMEPA uses the clinical expertise of its staff to anticipate the conditions of the clinical setting where the product is likely to be used based on the characteristics of the proposed product. DMEPA considers the product characteristics associated with the proposed product throughout the risk assessment because the product characteristics of the proposed may provide a context for communication of the drug name and ultimately determine the use of the product in the *usual* clinical practice setting.

¹ National Coordinating Council for Medication Error Reporting and Prevention.
<http://www.nccmerp.org/aboutMedErrors.html>. Last accessed 10/11/2007.

Typical product characteristics considered when identifying drug names that could potentially be confused with the proposed proprietary name include, but are not limited to; established name of the proposed product, proposed indication of use, dosage form, route of administration, strength, unit of measure, dosage units, recommended dose, typical quantity or volume, frequency of administration, product packaging, storage conditions, patient population, and prescriber population. DMEPA considers how these product characteristics may or may not be present in communicating a product name throughout the medication use system. Because drug name confusion can occur at any point in the medication use process, DMEPA considers the potential for confusion throughout the entire U.S. medication use process, including drug procurement, prescribing and ordering, dispensing, administration, and monitoring the impact of the medication.² The product characteristics considered for this review appears in Appendix B1 of this review.

The DMEPA considers the spelling of the name, pronunciation of the name when spoken, and appearance of the name when scripted. DMEPA compares the proposed proprietary name with the proprietary and established name of existing and proposed drug products and names currently under review at the FDA. DMEPA compares the pronunciation of the proposed proprietary name with the pronunciation of other drug names because verbal communication of medication names is common in clinical settings. DMEPA examines the phonetic similarity using patterns of speech. If provided, DMEPA will consider the Sponsor's intended pronunciation of the proprietary name. However, DMEPA also considers a variety of pronunciations that could occur in the English language because the Sponsor has little control over how the name will be spoken in clinical practice. The orthographic appearance of the proposed name is evaluated using a number of different handwriting samples. DMEPA applies expertise gained from root-cause analysis of postmarketing medication errors to identify sources of ambiguity within the name that could be introduced when scripting (e.g., "T" may look like "F," lower case 'a' looks like a lower case 'u,' etc). Additionally, other orthographic attributes that determine the overall appearance of the drug name when scripted (see Table 1 below for details).

² Institute of Medicine. Preventing Medication Errors. The National Academies Press: Washington DC. 2006.

Table 1. Criteria Used to Identify Drug Names that Look- or Sound-Similar to a Proposed Proprietary Name.

Type of Similarity	Considerations when Searching the Databases		
	<i>Potential Causes of Drug Name Similarity</i>	<i>Attributes Examined to Identify Similar Drug Names</i>	<i>Potential Effects</i>
Look-alike	Similar spelling	Identical prefix Identical infix Identical suffix Length of the name Overlapping product characteristics	<ul style="list-style-type: none"> Names may appear similar in print or electronic media and lead to drug name confusion in printed or electronic communication Names may look similar when scripted and lead to drug name confusion in written communication
	Orthographic similarity	Similar spelling Length of the name/Similar shape Upstrokes Down strokes Cross-strokes Dotted letters Ambiguity introduced by scripting letters Overlapping product characteristics	<ul style="list-style-type: none"> Names may look similar when scripted, and lead to drug name confusion in written communication
Sound-alike	Phonetic similarity	Identical prefix Identical infix Identical suffix Number of syllables Stresses Placement of vowel sounds Placement of consonant sounds Overlapping product characteristics	<ul style="list-style-type: none"> Names may sound similar when pronounced and lead to drug name confusion in verbal communication

Lastly, DMEPA considers the potential for the proposed proprietary name to inadvertently function as a source of error for reasons other than name confusion. Post-marketing experience has demonstrated that proprietary names (or components of the proprietary name) can be a source of error in a variety of ways. Consequently, DMEPA considers and evaluates these broader safety implications of the name throughout this assessment and the medication error staff provides additional comments related to the

safety of the proposed proprietary name or product based on professional experience with medication errors.

1. Database and Information Sources

DMEPA searches the internet, several standard published drug product reference texts, and FDA databases to identify existing and proposed drug names that may sound-alike or look-alike to the proposed proprietary name. A standard description of the databases used in the searches is provided in the reference section of this review. To complement the process, the DMEPA uses a computerized method of identifying phonetic and orthographic similarity between medication names. The program, Phonetic and Orthographic Computer Analysis (POCA), uses complex algorithms to select a list of names from a database that have some similarity (phonetic, orthographic, or both) to the trademark being evaluated. Lastly, DMEPA reviews the USAN stem list to determine if any USAN stems are present within the proprietary name. The individual findings of multiple safety evaluators are pooled and presented to the CDER Expert Panel. DMEPA also evaluates if there are characteristics included in the composition that may render the name unacceptable from a safety perspective (abbreviation, dosing interval, etc.).

2. Expert Panel Discussion

DMEPA gathers CDER professional opinions on the safety of the proposed product and discussed the proposed proprietary name (Expert Panel Discussion). The Expert Panel is composed of Division of Medication Errors Prevention (DMEPA) staff and representatives from the Division of Drug Marketing, Advertising, and Communications (OPDP). We also consider input from other review disciplines (OND, ONDQA/OBP). The Expert Panel also discusses potential concerns regarding drug marketing and promotion related to the proposed names.

The primary Safety Evaluator presents the pooled results of the database and information searches to the Expert Panel for consideration. Based on the clinical and professional experiences of the Expert Panel members, the Panel may recommend additional names, additional searches by the primary Safety Evaluator to supplement the pooled results, or general advice to consider when reviewing the proposed proprietary name.

3. FDA Prescription Simulation Studies

Three separate studies are conducted within the Centers of the FDA for the proposed proprietary name to determine the degree of confusion of the proposed proprietary name with marketed U.S. drug names (proprietary and established) due to similarity in visual appearance with handwritten prescriptions or verbal pronunciation of the drug name. The studies employ healthcare professionals (pharmacists, physicians, and nurses), and attempts to simulate the prescription ordering process. The primary Safety Evaluator uses the results to identify orthographic or phonetic vulnerability of the proposed name to be misinterpreted by healthcare practitioners.

In order to evaluate the potential for misinterpretation of the proposed proprietary name in handwriting and verbal communication of the name, inpatient medication orders and/or outpatient prescriptions are written, each consisting of a combination of marketed and unapproved drug products, including the proposed name. These orders are optically

scanned and one prescription is delivered to a random sample of participating health professionals via e-mail. In addition, a verbal prescription is recorded on voice mail. The voice mail messages are then sent to a random sample of the participating health professionals for their interpretations and review. After receiving either the written or verbal prescription orders, the participants record their interpretations of the orders which are recorded electronically.

4. Comments from Other Review Disciplines

DMEPA requests the Office of New Drugs (OND) and/or Office of Generic Drugs (OGD), ONDQA or OBP for their comments or concerns with the proposed proprietary name, ask for any clinical issues that may impact the DMEPA review during the initial phase of the name review. Additionally, when applicable, at the same time DMEPA requests concurrence/non-concurrence with OPDP's decision on the name. The primary Safety Evaluator addresses any comments or concerns in the safety evaluator's assessment.

The OND/OGD Regulatory Division is contacted a second time following our analysis of the proposed proprietary name. At this point, DMEPA conveys their decision to accept or reject the name. The OND or OGD Regulatory Division is requested to provide any further information that might inform DMEPA's final decision on the proposed name.

Additionally, other review disciplines opinions such as ONDQA or OBP may be considered depending on the proposed proprietary name.

5. Safety Evaluator Risk Assessment of the Proposed Proprietary Name

The primary Safety Evaluator applies his/her individual expertise gained from evaluating medication errors reported to FDA, considers all aspects of the name that may be misleading or confusing, conducts a Failure Mode and Effects Analysis, and provides an overall decision on acceptability dependent on their risk assessment of name confusion. Failure Mode and Effects Analysis (FMEA) is a systematic tool for evaluating a process and identifying where and how it might fail.³ When applying FMEA to assess the risk of a proposed proprietary name, DMEPA seeks to evaluate the potential for a proposed proprietary name to be confused with another drug name because of name confusion and, thereby, cause errors to occur in the medication use system. FMEA capitalizes on the predictable and preventable nature of medication errors associated with drug name confusion. FMEA allows the Agency to identify the potential for medication errors due to orthographically or phonetically similar drug names prior to approval, where actions to overcome these issues are easier and more effective than remedies available in the post-approval phase.

In order to perform an FMEA of the proposed name, the primary Safety Evaluator must analyze the use of the product at all points in the medication use system. Because the proposed product is has not been marketed, the primary Safety Evaluator anticipates the use of the product in the usual practice settings by considering the clinical and product

³ Institute for Healthcare Improvement (IHI). Failure Mode and Effects Analysis. Boston. IHI:2004.

characteristics listed in Appendix B1 of this review. The Safety Evaluator then analyzes the proposed proprietary name in the context of the usual practice setting and works to identify potential failure modes and the effects associated with the failure modes.

In the initial stage of the Risk Assessment, the Safety Evaluator compares the proposed proprietary name to all of the names gathered from the above searches, Expert Panel Discussion, and prescription studies, external studies, and identifies potential failure modes by asking:

“Is the proposed proprietary name convincingly similar to another drug name, which may cause practitioners to become confused at any point in the usual practice setting? And Are there any components of the name that may function as a source of error beyond sound/look-alike”

An affirmative answer indicates a failure mode and represents a potential for the proposed proprietary name to be confused with another proprietary or established drug name because of look- or sound-alike similarity or because of some other component of the name. If the answer to the question is no, the Safety Evaluator is not convinced that the names possess similarity that would cause confusion at any point in the medication use system, thus the name is eliminated from further review.

In the second stage of the Risk Assessment, the primary Safety Evaluator evaluates all potential failure modes to determine the likely *effect* of the drug name confusion, by asking:

“Could the confusion of the drug names conceivably result in medication errors in the usual practice setting?”

The answer to this question is a central component of the Safety Evaluator’s overall risk assessment of the proprietary name. If the Safety Evaluator determines through FMEA that the name similarity would not ultimately be a source of medication errors in the usual practice setting, the primary Safety Evaluator eliminates the name from further analysis. However, if the Safety Evaluator determines through FMEA that the name similarity could ultimately cause medication errors in the usual practice setting, the Safety Evaluator will then recommend the use of an alternate proprietary name.

Moreover, DMEPA will object to the use of proposed proprietary name when the primary Safety Evaluator identifies one or more of the following conditions in the Overall Risk Assessment:

- a. OPDP finds the proposed proprietary name misleading from a promotional perspective, and the Review Division concurs with OPDP’s findings. The Federal Food, Drug, and Cosmetic Act provides that labeling or advertising can misbrand a product if misleading representations are made or suggested by statement, word, design, device, or any combination thereof, whether through a PROPRIETARY name or otherwise [21 U.S.C 321(n); See also 21 U.S.C. 352(a) & (n)].
- b. DMEPA identifies that the proposed proprietary name is misleading because of similarity in spelling or pronunciation to another proprietary or established name of a different drug or ingredient [CFR 201.10.(C)(5)].

- c. FMEA identifies the potential for confusion between the proposed proprietary name and other proprietary or established drug name(s), and demonstrates that medication errors are likely to result from the drug name confusion under the conditions of usual clinical practice.
- d. The proposed proprietary name contains an USAN (United States Adopted Names) stem.
- e. DMEPA identifies a potential source of medication error within the proposed proprietary name. For example, the proprietary name may be misleading or, inadvertently, introduce ambiguity and confusion that leads to errors. Such errors may not necessarily involve confusion between the proposed drug and another drug product but involve a naming characteristic that when incorporated into a proprietary name, may be confusing, misleading, cause or contribute to medication errors.

If DMEPA objects to a proposed proprietary name on the basis that drug name confusion could lead to medication errors, the primary Safety Evaluator uses the FMEA process to identify strategies to reduce the risk of medication errors. DMEPA generally recommends that the Sponsor select an alternative proprietary name and submit the alternate name to the Agency for review. However, in rare instances FMEA may identify plausible strategies that could reduce the risk of medication error of the currently proposed name. In that instance, DMEPA may be able to provide the Sponsor with recommendations that reduce or eliminate the potential for error and, thereby, would render the proposed name acceptable.

In the event that DMEPA objects to the use of the proposed proprietary name, based upon the potential for confusion with another proposed (but not yet approved) proprietary name, DMEPA will provide a contingency objection based on the date of approval. Whichever product, the Agency approves first has the right to use the proprietary name, while DMEPA will recommend that the second product to reach approval seek an alternative name.

The threshold set for objection to the proposed proprietary name may seem low to the Applicant/Sponsor. However, the safety concerns set forth in criteria a through e above are supported either by FDA regulation or by external healthcare authorities, including the Institute of Medicine (IOM), World Health Organization (WHO), the Joint Commission, and the Institute for Safe Medication Practices (ISMP). These organizations have examined medication errors resulting from look- or sound-alike drug names, confusing, or misleading names and called for regulatory authorities to address the issue prior to approval. Additionally, DMEPA contends that the threshold set for the Proprietary Name Risk Assessment is reasonable because proprietary drug name confusion is a predictable and preventable source of medication error that, in many instances, the Agency and/or Sponsor can identify and rectify prior to approval to avoid patient harm.

Furthermore, post-marketing experience has demonstrated that medication errors resulting from drug name confusion are notoriously difficult to rectify post-approval. Educational and other post-approval efforts are low-leverage strategies that have had limited effectiveness at alleviating medication errors involving drug name confusion. Sponsors have undertaken higher-leverage strategies, such as drug name changes, in the

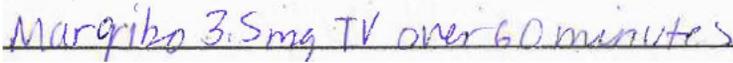
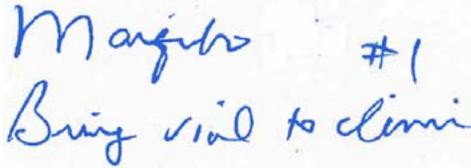
past but at great financial cost to the Sponsor and at the expense of the public welfare, not to mention the Agency’s credibility as the authority responsible for approving the error-prone proprietary name. Moreover, even after Sponsors’ have changed a product’s proprietary name in the post-approval phase, it is difficult to eradicate the original proprietary name from practitioners’ vocabulary, and as a result, the Agency has continued to receive reports of drug name confusion long after a name change in some instances. Therefore, DMEPA believes that post-approval efforts at reducing name confusion errors should be reserved for those cases in which the potential for name confusion could not be predicted prior to approval.

Appendix B: Letters with Possible Orthographic or Phonetic Misinterpretation

Letters in Name, Marqibo	Scripted May Appear as	Spoken May Be Interpreted as
Capital ‘M’	H, N, Z	n
lowercase ‘m’	m, n, ss, n	n
lowercase ‘a’	c, ci, ce, o, u	any vowel
lowercase ‘r’	n, u, v, x	wr
lowercase ‘q’	g, j, qu	k, qu
lowercase ‘i’	e	any vowel
lowercase b;	h, l, li	d, v
lowercase ‘o’	a, e, u	any vowel

Appendix C: Prescription Simulation Samples and Results

Figure 1. Marqibo Study (Conducted on November 17, 2011)

Handwritten Medication Order	Verbal Prescription
<p><u>Medication Order:</u> </p>	<p>Marqibo Kit #1 Bring Kit to Clinic</p>
<p><u>Outpatient Prescription:</u> </p>	

FDA Prescription Simulation Responses

Inpatient Medication Order	Outpatient Prescription	Voice Prescription
Margibo	Margibo	Markebo Kit
Margibo	Margibro	Markevo
Margribo	Margilo	Markevo
Margribo	Margilo	Markevo Kit
Margribo	Margilo	Markevo Kit
Marqibo	Marjito	Markevo Kit
Marqibo	Marqib	Markibo Kit
	Marqibo	Markivo Kit
	Marqibo	Marquibo Kit
	Marqibo	Marquivo Kit
	Marqibo	Martivo Kit
	Marqih	
	Marqih	
	Marqito	
	Marzin	

Appendix D: Proprietary names determined in OSE Review 2008-1983 not likely to lead to a medication error.

Proprietary Name	Active Ingredient	Similarity to Marqibo
Macrobid	Nitrofurantoin Monohydrate Macrocrystalline	Look
Margesic	Acetaminophen, Caffeine, and Butalbital	Look
Marplan	Isocarboxazid	Look
Meridia	Sibutramine Hydrochloride	Look
	Morphine	Look
	Morphine Sulfate	Look
Mozobil	Plerixafor	Look
Norgesic	Orphenadrine Citrate, Aspirin, and Caffeine	Look

Appendix E: Proprietary names not likely to be confused or not used in usual practice settings for the reasons described.

Proprietary Name	Active Ingredient	Similarity to Marqibo	Failure preventions
Marcaine	Bupivacaine Hydrochloride	Look	Lacks significant orthographic or phonetic similarities
Marqibo ^{***}	Kit for Vincristine Sulfate Liposomes Injection)	Look and Sound	Trademarked by Talon Therapeutics, which is the Applicant for this NDA
Miradon	Anisindione	Look	Applicant withdrew approval of NDA December 7, 2007. No generics available.

^{***} This document contains proprietary and confidential information that should not be released to the public.

Appendix F: Risk of medication errors due to product confusion minimized by dissimilarity of the names and/ or use in clinical practice for the reasons described.

<p>Proposed name:</p> <p>Marqibo (Kit for Vincristine Sulfate Liposomes Injection)</p>	<p>Strength(s):</p> <p>0.16 mg/mL or 5 mg/5 mL</p>	<p>Usual dose:</p> <p>Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)</p>
<p>Failure Mode:</p> <p>Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion</p>	<p>Causes (could be multiple)</p>	<p>Prevention of Failure Mode</p>
<p>Mafenide (Mafenide Acetate)</p> <p>50 gm packets</p> <p>Usual Dose: Apply to burn wounds with sterile glove</p>	<p>Orthographic similarity</p> <ul style="list-style-type: none"> - Both names share upstroke letters ('M', 'd' vs. 'M', 'b') and dotted letter ('i') in similar positions - Both names begin with the letters 'Ma' <p>Numeric similarity</p> <ul style="list-style-type: none"> - 50 mg vs. 5 mg 	<p>Orthographic differences</p> <ul style="list-style-type: none"> - Mafenide contains an additional upstroke letter 'f'. <p>Product characteristic differences</p> <ul style="list-style-type: none"> - Dose: 50 gm vs. 3 mg to 5 mg <p>Context of use</p> <ul style="list-style-type: none"> - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order. <p>A medication order for Mafenide may written "use as directed" or Apply as directed. These instructions are less likely to be used for a chemotherapeutic agent.</p>
<p>Mag-Oxide (Magnesium Oxide)</p> <p>400 mg tablets</p> <p>Usual Dose: 1 to 2 tablets daily</p>	<p>Orthographic similarity</p> <ul style="list-style-type: none"> - Both share identical letters in similar positions 'Ma', 'i'. - Both names share letters that appear similar when scripted 'g' vs. 'q'. 	<p>Orthographic differences</p> <ul style="list-style-type: none"> - Mag-Oxide contains an additional upstroke letter 'O'. <p>Product characteristic differences</p> <ul style="list-style-type: none"> - Dose: 400 mg vs. 3 mg to 5 mg - Frequency of Administration: daily vs. every 7 days <p>Context of use</p> <ul style="list-style-type: none"> - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.

Proposed name: Marqibo (Kit for Vincristine Sulfate Liposomes Injection)	Strength(s): 0.16 mg/mL or 5 mg/5 mL	Usual dose: Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	Causes (could be multiple)	Prevention of Failure Mode
Marezine (Cyclizine HCl) 50 mg tablet Usual Dose: 1 tablet every 4 to 6 hours, max 4 tablets/day	Orthographic similarity - Both names identical letters in similar or same positions with ‘Mar-’, ‘i’ - Both name share a downstroke letters in similar positions that appears similar when scripted ‘g’ vs. ‘q’. Numeric similarity - 50 mg vs. 5 mg	Orthographic differences - Marqibo contains an additional upstroke letter ‘b’. Product characteristic differences - Dose: 50 mg vs. 3 mg to 5 mg - Frequency of Administration: every 4 to 6 hours vs. every 7 days. Context of use - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.
Margosa (also known as Neem) 2% to 5% topical cream or oil Usual Dose: Apply 3 to 5 milliliters to exposed areas for insect repellent. Neem and turmeric paste, topical: Apply to affected areas twice daily after bathing and sterilization of clothing for scabies	Orthographic similarity - Both names begin with ‘Mar-’ - Both names share letters that appear similar when scripted ‘g’ vs. ‘q’, ‘a’ vs. ‘o’. Numeric similarity - 5% vs. 5 mg	Orthographic differences - Marqibo contains an additional upstroke letter ‘b’. Product characteristic differences - Frequency of Administration: twice daily vs. every 7 days. Context of use - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order. - Alternative medication used mainly in India, although available in alternative medicines in the US. It is unlikely a physician will prescribe this product for insect repellent or treatment of scabies.

Proposed name: Marqibo (Kit for Vincristine Sulfate Liposomes Injection)	Strength(s): 0.16 mg/mL or 5 mg/5 mL	Usual dose: Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	Causes (could be multiple)	Prevention of Failure Mode
Marinol (Dronabinol) 2.5 mg, 5 mg, 10 mg capsule Usual Dose: 5 mg orally 1 to 4 times daily, max 20 mg/day or 15 mg/m ² /day depending on indication	Orthographic similarity - Both begin with the letters 'Mar' - Both name have upstroke letters toward the end of the name 'l' vs. 'b' Overlapping Dose - 5 mg	Orthographic differences - Marqibo contains an additional downstroke letter 'q'. - Marqibo contains an additional letter 'o' after the last upstroke letter 'b'. Product characteristic differences - Frequency of Administration: 1 to 4 times daily vs. every 7 days. Context of use - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.
Maxzide (Triamterene and Hydrochlorothiazide) 75 mg/50 mg tablets Usual Dose: 1 tablet orally daily	Orthographic similarity - Both begin with 'Ma'. - Both names contain letters that appear similar when scripted 'xzi' vs. 'rqi', 'e' vs. 'o'. - Both names contain similar upstroke letter in similar position 'd' vs. 'b'.	Product characteristic differences - Dose: 75 mg/50 mg (1 tablet) vs. 3 mg to 5 mg - Frequency of Administration: once daily vs. every 7 days. Context of use - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.

<p>Proposed name: Marqibo (Kit for Vincristine Sulfate Liposomes Injection)</p>	<p>Strength(s): 0.16 mg/mL or 5 mg/5 mL</p>	<p>Usual dose: Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)</p>
<p>Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion</p>	<p>Causes (could be multiple)</p>	<p>Prevention of Failure Mode</p>
(b) (4)		
<p>Morgel (Aluminum Hydroxide and Magnesium Carbonate) 95 mg/358 mg per 15 mL Usual Dose: 15 mL (1 tablespoonful) 4 times a day after meals and bedtime</p>	<p>Orthographic similarity - Both names share letters that appear similar when scripted 'Morgel' vs. 'Marqib-'</p>	<p>Orthographic differences - Marqibo contains an additional letter 'o' after the last upstroke letter 'b'. Product characteristic differences - Dose: 1 tablespoonful or 15 mL vs. 3 mg to 5 mg - Frequency of Administration: 4 times daily vs. every 7 days. - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.</p>

Proposed name: Marqibo (Kit for Vincristine Sulfate Liposomes Injection)	Strength(s): 0.16 mg/mL or 5 mg/5 mL	Usual dose: Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	Causes (could be multiple)	Prevention of Failure Mode
Morgidox (Doxycycline Hyclate Capsules, USP) 100 mg, 200 mg capsules Usual Dose: 1 capsule daily	Orthographic similarity - Both names share letters that appear similar when scripted 'Morgido' vs. 'Marqibo'	Orthographic differences - Morgidox contains an additional crosstroke letter 'x'. Product characteristic differences - Dose: 1 capsule (100 mg, 200 mg) vs. 3 mg to 5 mg - Frequency of Administration: daily vs. every 7 days Context of use - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.
Nucynta (Tapentadol HCl) 50 mg, 75 mg, 100 mg Usual Dose: 1 tablet every 4 to 6 hours, max 600 mg daily	Orthographic similarity - Both names share letters that appear similar when scripted 'Nucy-' vs. 'Marq' - Both name contain upstroke letter in similar position 't' vs. 'b' Numeric similarity - 50 mg vs. 5 mg	Orthographic differences - Nucynta contains an additional crosstroke letter 't'. Product characteristic differences - Dose: 1 tablet (75 mg, 100 mg) vs. 3 mg to 5 mg - Frequency of Administration: every 4 to 6 hours vs. every 7 days Context of use - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.

Proposed name: Marqibo (Kit for Vincristine Sulfate Liposomes Injection)	Strength(s): 0.16 mg/mL or 5 mg/5 mL	Usual dose: Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	Causes (could be multiple)	Prevention of Failure Mode
<p>Nucynta ER (Tapentadol HCl)</p> <p>50 mg, 100 mg, 150 mg, 200 mg, 250 mg</p> <p>Usual Dose: 1 tablet twice daily (approximately every 12 hours), max 500 mg daily</p>	<p>Orthographic similarity</p> <ul style="list-style-type: none"> - Both names share letters that appear similar when scripted ‘Nucy-’ vs. ‘Marq’ - Both name contain upstroke letter in similar position ‘t’ vs. ‘b’ <p>Numeric similarity</p> <ul style="list-style-type: none"> - 50 mg vs. 5 mg 	<p>Orthographic differences</p> <ul style="list-style-type: none"> - Nucynta ER contains an additional crosstroke letter ‘t’ - Nucynta ER contains additional letters ‘ER’ at the end of the name. <p>Product characteristic differences</p> <ul style="list-style-type: none"> - Dose: 1 tablet (100 mg, 150 mg, 200 mg, 250 mg) vs. 3 mg to 5 mg - Frequency of Administration: twice daily vs. every 7 days <p>Context of use</p> <ul style="list-style-type: none"> - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.
<p>Herceptin (Trastuzumab)</p> <p>440 mg, for injection</p> <p>Usual Dose: 2 mg/kg to 8 mg/kg intravenous infusion over 30 to 90 minutes. Frequency every 1 to 3 weeks depending on indication</p>	<p>Orthographic similarity</p> <ul style="list-style-type: none"> - Both names share letters that appear similar when scripted (‘Her-’ vs. ‘Mar-’) - Both names have upstroke letters (‘H’, ‘t’ vs. ‘M’, ‘b’) and downstroke (‘p’ vs. ‘q’) letters in similar positions, thus have a similar shape <p>Route of Administration:</p> <ul style="list-style-type: none"> - Intravenous infusion 	<p>Orthographic differences</p> <ul style="list-style-type: none"> - Herceptin (9 letters) appears longer in length compared to Marqibo (7 letters) - The letters at the end of the names differ (‘-ceptin’ vs. ‘-qibo’) <p>Product characteristic differences</p> <ul style="list-style-type: none"> - Dose: 90 mg to 1040 mg vs. 3 mg to 5 mg

<p>Proposed name: Marqibo (Kit for Vincristine Sulfate Liposomes Injection)</p>	<p>Strength(s): 0.16 mg/mL or 5 mg/5 mL</p>	<p>Usual dose: Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)</p>
<p>Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion</p>	<p>Causes (could be multiple)</p>	<p>Prevention of Failure Mode</p>
<p>Horizant (Gabapentin Enacarbil) 600 mg extended release tablet Usual Dose: 1 tablet orally at bedtime</p>	<p>Orthographic similarity - Both names share letters that appear similar when scripted ('Horiz-' vs. 'Marq-')</p>	<p>Orthographic differences - The ending letters are distinct ('-ant' vs. 'ibo')</p> <p>Product characteristic differences - Dose: 600 mg vs. 3 mg to 5 mg - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.</p>

(b) (4)

*** This document contains proprietary and confidential information that should not be released to the public.

Proposed name: Marqibo (Kit for Vincristine Sulfate Liposomes Injection)	Strength(s): 0.16 mg/mL or 5 mg/5 mL	Usual dose: Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	Causes (could be multiple)	Prevention of Failure Mode
Miralax (Polyethylene Glycol) 17 g, 119 g, 238 g, 510 g powder for solution Usual Dose: 1 scoop (17 g) once daily in 8 oz of water	Orthographic similarity - Both names share letters that appears similar when scripted ('Mir-' vs. 'Mar-'),	Orthographic differences - The ending letters are distinct ('-alax' vs. 'qibo') - Marqibo contains an additional downstroke 'q' Product characteristic differences - Dose: 1 scoop or 17 g vs. 3 mg to 5 mg - A medication order for Miralax may contain instructions to dissolve in water or use as directed. - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.
Norquest Fe (Ethinyl Estradiol, Ferrous Fumarate and Norethindrone) 0.035 mg/75 mg/1 mg tablet Usual Dose: 1 tablet daily	Orthographic similarity - Both names share letters that appear similar when scripted ('Norq-' vs. 'Marq-')	Orthographic differences - The ending letters are distinct ('-uest Fe' vs. 'qibo') Product characteristic differences - Dose: 1 tablet vs. 3 mg to 5 mg - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order. Regulatory Status - Applicant no longer manufactures this product. No generics available.

Proposed name: Marqibo (Kit for Vincristine Sulfate Liposomes Injection)	Strength(s): 0.16 mg/mL or 5 mg/5 mL	Usual dose: Infuse 2.25 mg/m² intravenously over 60 minutes every 7 days. Dose range 3 mg to 5 mg for BSA (1.4 mg/m² to 2.2 mg/m²)
Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion	Causes (could be multiple)	Prevention of Failure Mode
Nuvigil (Armodafinil) 50 mg, 150 mg, 250 mg tablet Usual Dose: 1 tablet in the morning	Orthographic similarity - Both names share letters that appear similar when scripted ('Nuv-' vs. 'Mar-'), ('-gil' vs. '-qib') Numeric similarity - 50 mg vs. 5 mg	Orthographic differences - Marqibo contains an additional letter 'o' after the last downstroke letter 'b'. Product characteristic differences - Dose: 1 tablet (150 mg, 250 mg) vs. 3 mg to 5 mg - Frequency of Administration: once daily vs. once weekly - A medication order for Marqibo, which is a chemotherapeutic agent, will likely contain more information such as weight, body surface area, and infusion rate compared to a standard medication order.

This is a representation of an electronic record that was signed electronically and this page is the manifestation of the electronic signature.

/s/

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