CENTER FOR DRUG EVALUATION AND RESEARCH

APPLICATION NUMBER:

203585Orig1s000

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

Date:	September 21, 2012
Reviewer:	Kevin Wright, PharmD Division of Medication Error and Prevention Analysis
Acting Team Leader:	Yelena Maslov, PharmD Division of Medication Error and Prevention Analysis
Division Director:	Carol A. Holquist, RPh. Division of Medication Error and Prevention Analysis
Drug Name and Strength:	Synribo (Omacetaxine Mepasuccinate) for Injection 3.5 mg per vial
Application Type/Number:	NDA 203585
Applicant/Sponsor:	Cephalon, Inc.
OSE RCM #:	2012-1587

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

CONTENTS

1 INTRODUCTION 1
1.1 Regulatory History 1
2 RESULTS 1
2.1 Promotional Assessment 1
2.2 Safety Assessment 1
3 CONCLUSIONS 4
3.1 Comments to the Applicant 4
4 REFERENCES 5
APPENDICES 8

1 INTRODUCTION

This review evaluates the proposed proprietary name, Synribo, 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 Applicant submitted the proposed proprietary name, Synribo on July 12, 2012. This is the second proposed proprietary name for this product. The first name, Omasona, was found unacceptable by DMEPA on June 28, 2012 in OSE Review #2012-811.

1.2 PRODUCT INFORMATION

The following product information is provided in the July 12, 2012 proprietary name submission.

- Active Ingredient: Omacetaxine Mepesuccinate
- Indication of Use: treatment of adult patients with chronic or accelerated phase chronic myeloid leukemia (CML) with resistance and/or intolerence to two or more tyrosine kinase inhibitors (TKI).
- Route of Administration: Subcutaneous injection
- Dosage Form: Powder for Injection
- Strength: 3.5 mg
- Dose and Frequency: 1.3 mg/m^2 subcutaneously twice daily
- How Supplied: 8 milliliter glass vial
- Storage: store at 25°C (77°F); excursions permitted between 15°C and 30°C (59°F to 86°F). Until use, keep product in carton to protect from light.
- Container and Closure Systems: glass vial [redacted] (b) (4).

2. RESULTS

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

2.1 PROMOTIONAL ASSESSMENT

The Office of Prescription Drug Promotion (OPDP) 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 were considered in the safety evaluation of the name.

2.2.1 United States Adopted Names (USAN) SEARCH

The August 10, 2012 search of the United States Adopted Name (USAN) stems did not identify that a USAN stem is present in the proposed proprietary name.

2.2.2 Components of the Proposed Proprietary Name

The Applicant indicated in their submission that the proposed name, Synribo, has no intended meaning or derivation. This proprietary name is comprised of a single word that does not contain any components (i.e. a modifier, route of administration, dosage form, etc.) that are misleading or can contribute to medication error.

2.2.3 FDA Name Simulation Studies

Twenty-eight practitioners participated in DMEPA's prescription studies. The interpretations did not overlap with or appear or sound similar to any currently marketed products. In the written studies, 9 of 20 participants correctly interpreted the prescription. Common misinterpretations in the written study were substitution of 'synn', for 'syn' and 'rebo', 'rito' and 'ubo' for 'ribo'. In the voice study all 8 participants incorrectly interpreted the prescription. Common misinterpretations in the voice study include: 'cyn' and 'fen', 'fin' for 'syn' and 'rebo', 'rebro', 'rivo' for 'ribo'. 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, August 3, 2012 e-mail, the Division of Hematology Products (DHP) did not forward any comments or concerns relating to the proposed name at the initial phase of the proprietary name review.

2.2.5 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, Synribo. Table 1 lists the names with orthographic, phonetic, or spelling similarity to the proposed proprietary name, Synribo identified by the primary reviewer, the Expert Panel Discussion (EPD), and other review disciplines. Table 1 also includes the names identified from the by (b) (4) not identified by DMEPA and require further evaluation.

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

Look Similar					
Name	***Source***	***Name***	***Source***	***Name***	***Source***
Durezol	EPD	Duricef	EPD	Dyazide	EPD
Gynazole	EPD	Gynovite Plus	EPD	Lunesta	EPD
Lyrica	EPD	Lysteda	EPD	Marqibo	EPD
Spiriva	EPD	Sufenta	EPD	Surelac	EPD
Survanta	EPD	Sycrest	EPD	Syeda	EPD
Symbid	EPD	Symlin	EPD	(b) (4)	EPD
Synalar	EPD	Synaplin	EPD	Synarel	EPD
Synbio	EPD	Syncria	EPD	Syndyma	EPD
Synera***	EPD	Synercid	EPD	Synerx	EPD
Synsorb Pk	EPD	Synthroid	EPD	Synvisc	EPD
Tusnel C	EPD	Tysabri	EPD	Zymaxid	EPD
Sound Similar					
(b) (4)	EPD				
Look and Sound Similar					
Synribo	EPD				

Our analysis of the 35 names contained in Table 1 considered the information obtained in the previous sections along with their product characteristics. We determined all 35 names will not pose a risk for confusion as described in Appendices D through E.

2.2.6 Communication of DMEPA's Final Decision to Other Disciplines

DMEPA communicated our findings to the Division of Hematology Products via e-mail on September 14, 2012. At that time we also requested additional information or concerns that could inform our review. Per e-mail correspondence from the Division of Hematology Products on September 21, 2012, they stated no additional concerns with the proposed proprietary name, Synribo.

3 CONCLUSIONS

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

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

3.1 COMMENTS TO THE APPLICANT

We have completed our review of the proposed proprietary name, Synribo, and have concluded that this name is acceptable. However, if any of the proposed product characteristics as stated in your July 12, 2012 submission are altered, DMEPA rescinds this finding and the name must be resubmitted for review.

Additionally, the proposed proprietary name must be re-reviewed 90 days prior to approval of the NDA. 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 (www.thomsonhc.com/home/dispatch)***

    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 (www.medilexicon.com)***

    Medical Abbreviations dictionary 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. ***Natural Standard (http://www.naturalstandard.com)***

    Natural Standard is a resource that aggregates and synthesizes data on complementary and alternative medicine.

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

---

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

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.

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 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**		
	Potential Causes of Drug Name Similarity	*Attributes Examined to Identify Similar Drug Names*	*Potential Effects*
Look-alike	Similar spelling	Identical prefix Identical infix Identical suffix Length of the name Overlapping product characteristics	• 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	• 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	• 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 gather 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 Office of Prescription Drug Promotion (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 Section 1.2 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 posses 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, Synribo	Scripted May Appear as	Spoken May Be Interpreted as
Capital letter 'S'	G, 5	X
Lower case 's'	G, g, n, 5	x
Lower case 'y'	F, p, u, v, x, z	E, i, u
Lower case 'n'	m, u, x, r, h, s	Dn, gn,kn, mn, pn
Lower case 'r'	e, s, n, v	
Lower case 'i'	e	
Lower case 'b'	I, h, k	p, v, d
Lower case 'o'	a, c, e, u	Oh
Letter string 'syn'	Cyn	Cyn
Letter string 'ri'	m	

Appendix C: Prescription Simulation Samples and Results

Figure 1. Synribo Study (Conducted on July 27, 2012)

Handwritten Requisition Medication Order	Verbal Prescription
Medication Order: Synribo 2mg Sub@ BID	Synribo 2 mg Sub-q twice #2
Outpatient Prescription: Synribo 2mg Sub@ BID	

FDA Prescription Simulation Responses (Aggregate 1 Rx Studies Report)

			88 People Received Study 28 People Responded	
Study Name: Synribo				
Total	**11**	**8**	**9**	**28**
INTERPRETATION	**INPATIENT**	**VOICE**	**OUTPATIENT**	**TOTAL**
CINRIVO	0	1	0	1
CYNRIVO	0	1	0	1
FENREBRO	0	1	0	1
FINREBO	0	1	0	1
SENRIBO	0	1	0	1
SINREBO	0	1	0	1
SINREEBO	0	1	0	1
SYNITRO	0	0	1	1
SYNNIBO	1	0	0	1
SYNREBO	2	1	0	3
SYNRIBO	2	0	7	9
SYNRITO	0	0	1	1
SYNUBO	6	0	0	6

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

No.	Proprietary Name	Active Ingredient	Similarity to Synribo	Failure preventions
1.	Durezol	Difluprednate	Look alike	The pair have sufficient orthographic and/or phonetic differences
2.	Duricef	Cefadroxil	Look alike	The pair have sufficient orthographic and/or phonetic differences
3.	Gynovite Plus		Look alike	The pair have sufficient orthographic and/or phonetic differences
4.	Lysteda	Tranexamic Acid	Look alike	The pair have sufficient orthographic and/or phonetic differences
5.	Marqibo	Vincristine Liposomal	Look alike	The pair have sufficient orthographic and/or phonetic differences
6.	Spiriva	Tiotropium	Look alike	The pair have sufficient orthographic and/or phonetic differences
7.	Sufenta	Sufentanil	Look alike	The pair have sufficient orthographic and/or phonetic differences
8.	Surelac	Lactase Enzyme	Look alike	The pair have sufficient orthographic and/or phonetic differences
9.	Survanta	Beractant	Look alike	The pair have sufficient orthographic and/or phonetic differences
10.	Sycrest	Asenspine	Look alike	Proprietary Name reviewed by DMEPA in OSE RCM# 2007-1992. Product approved under proprietary name, Saphris.
11.	Syeda	Ethinyl Estradiol and Drospirenone	Look alike	The pair have sufficient orthographic and/or phonetic differences

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

No.	Proprietary Name	Active Ingredient	Similarity to Synribo	Failure preventions
12.	Symbid	Clonidine Extended Release tablets	Look alike	Product approved under proprietary name, Kapvay.
13.	Symlin	Pramlintide Acetate	Look alike	The pair have sufficient orthographic and/or phonetic differences
14.				(b) (4)
15.	Synaplin	Dimethyl Fumarate	Look alike	The pair have sufficient orthographic and/or phonetic differences
16.	Synarel	Nafarelin Acetate	Look alike	The pair have sufficient orthographic and/or phonetic differences
17.	Synbio	Fructo-oliogosaccharides	Look alike	International product marketed in Indonesia
18.	Syncria***	(Albiglutide) Recombinant Human Protein	Look	(b) (4)
19.	Syndyma	Pertuzumab	Look alike	The pair have sufficient orthographic and/or phonetic differences
20.	Synera	Lidocaine and Tetracaine	Look alike	The pair have sufficient orthographic and/or phonetic differences
21.	Synerx		Look alike	Product is not a drug, but the name of a pharmaceutical firm.
22.		Synsorb Pk	Look alike	Orphan drug. No pending NDA or commercial IND within the agency.

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

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

No.	Proprietary Name	Active Ingredient	Similarity to Synribo	Failure preventions
23.	Synribo***	Omacetaxine Mepasuccinate	Look and Sound alike	The subject of this review
24.	Synthroid	Levothyroxine	Look alike	The pair have sufficient orthographic and/or phonetic differences
25.	Tusnel C	Brompheniramine maleate and Dextromethorphan and Guaifenesin	Look alike	The pair have sufficient orthographic and/or phonetic differences
26.	Zymaxid	Gatifloxacin	Look alike	The pair have sufficient orthographic and/or phonetic differences

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

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

No.	Proposed name: Synribo (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**

(b) (4)

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

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

No.	**Proposed name: Synribo** (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
2.	Dyazide Capsules (Hydrochlorothiazide and Triamterene) Dosage form: Capsule Strength: 25 mg/37.5 mg, 25 mg/50 mg Usual dose: Take 1 tablet by mouth daily	Orthographic similarity to Synribo When scripted the letters 'Sy' and 'Dy' may look similar. The names are identical in length and have a similar shape when 'z' is not scripted as a downstroke. Dosage form Both products are available as a single dosage form. Thus the dosage form maybe omitted when prescribed.	Orthographic differences When scripted the letter string 'nribo' looks different from 'azide'. Strength Single strength vs. multiple strengths and no overlap in strengths. Thus, the strength of Dyazide must be specified but the strength of Synribo may be omitted.

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

No.	**Proposed name: Synribo** (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
3.	Gynazole Cream (Butoconazole) Dosage form: Cream Strength: 2% Usual dose: Insert 1 applicatorful intravaginally at bedtime	Orthographic similarity to Synribo When scripted the letters 'Syn' and 'Gyn' may look similar. The names are similar in length and have a similar shape when 'z' is not scripted as a downstroke. Dosage form Both products are available as a single dosage form. Thus the dosage form maybe omitted when prescribed. Strength Numerical overlap in strength, 2 mg compared to 2%.	Orthographic differences When scripted the letter string 'ribo' looks different than 'azole'. The upstroke in the letter string 'ribo' appears in the third position whereas in 'azole' the upstroke appears in the fourth position.

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

No.	**Proposed name: Synribo** (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
4.	Lunesta Tablets (Eszopiclone) Dosage form: Tablets Strengths: 1 mg, 2 mg, 3 mg Usual dose: Take 1 tablet by mouth at bedtime	Orthographic similarity to Synribo When scripted the letter string 'Synr' may look similar to 'Lune'. The names are identical in length. Dosage form Both products are available as a single dosage form. Thus the dosage form maybe omitted when prescribed. Strength Numerical overlap in strength, 2 mg and 1 mg or 1 mL.	Orthographic differences When scripted the letter string 'ibo' looks different from 'sta' due to the cross stroke,'t'. Strength Single strength vs. multiple strengths and no overlap in strengths. Thus, the strength of Lunesta must be specified but the strength of Synribo may be omitted.

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

No.	**Proposed name: Synribo** (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
5.	Lyrica Capsules (Pregablin) Dosage form: Capsules Strengths: 25 mg, 50 mg, 75 mg, 100 mg, 150 mg, 200 mg, 225 mg, 300 mg Usual dose: Take 1 capsule by mouth two times daily OR Take 1 capsule by mouth three times daily	Orthographic similarity to Synribo When scripted the letter string 'Syn' and 'Lyri' may look similar. Additionally, the names are similar in length, 7 letters compared to 6 letters. Dosage form Both products are available as a single dosage form. Thus the dosage form maybe omitted when prescribed. Frequency of Administration Both products can be administered twice daily.	Orthographic differences When scripted the letter string 'ribo' looks different from 'ca'. Additionally, Synribo has a different shape from Lyrica. Synribo contains a downstroke in the second position and a upstroke in the sixth position whereas Lyrica contains one downstroke in the second position. Strength Single strength compared to multiple strength with no overlap in strength. Thus, the strength of Synribo may be omitted whereas the strength of Lyrica must be specified.

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

No.	**Proposed name: Synribo** (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
6.	Synalar Cream (Fluocinoline Acetonide) Dosage from: Cream Strength: 0.025% Usual dose: Apply to affected area 2 to 4 times daily OR Use as directed	Orthographic similarity to Synribo Both names begin with the letter string 'Syn'. Additionally, the names are identical in length. Dosage form Both products are available as a single dosage form. Thus the dosage form maybe omitted when prescribed. Frequency of Administration Both products can be administered twice daily. Strength Both products are available in a single strength. Thus, the strength may be omitted when prescribed.	Orthographic differences When scripted the letter string 'ribo' looks different from 'alar'. The upstroke in the letter string 'ribo' appears in the third position whereas in 'alar' the upstroke appears in the second position.

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

No.	**Proposed name: Synribo** (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
7.	Synercid for Injection (Dalfopristin and Quinupristin) Dosage form: Powder for Injection Strength: 500 mg, 600 mg Usual dose: 7.5 mg/kg intravenously every 8 hours Calculated dose: 525 mg intravenously every 8 hours	Orthographic similarity to Synribo Both names share the prefix, 'syn-'. Dosage form Both products are available as a single dosage form. Thus the dosage form maybe omitted when prescribed. Frequency of Administration Both products are multiple times per day. Route of Administration Both products are administered parenterally.	Orthographic differences When scripted the letter string 'ribo' looks longer than 'ercid'. Synribo has a different shape from Syncerid. Synribo contains an upstroke in the sixth position whereas Synercid contains an upstroke in the eighth position. Strength: 3.5 mg per vial vs. 500 mg and 600 mg Dose No overlap in dosing based on the proposed dose per body surface area vs. body weight.

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

No.	**Proposed name: Synribo** (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
8.	Synvisc Injection (Hylan G-F 20) Dosage form: Solution for Injection Strength: 8 mg/mL Usual dose: Inject 16 mg (2 mL) in affected knee(s)	Orthographic similarity to Synribo When scripted the letter string 'synri' may look similar to 'synvi' and the names are identical in length. Dosage form Both products are available as a single dosage form. Thus the dosage form maybe omitted when prescribed. Route of administration Similar routes of administration, subcutaneous vs. intra-articular. Strength Both products are available in a single strength, thus strength may be omitted when prescribed. Dosing: Both products can be administered at the dose of 2 mL	Orthographic differences When scripted the letters 'bo' look different from 'sc'. Additionally, Synribo has a different shape from Synvisc. Synribo contains an upstroke in the sixth position whereas Synvisc contains no upstrokes at the end of the name. Route of Administration: Subcutaneously vs. into the knee.

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

No.	**Proposed name: Synribo** (Omacetaxine Mepesuccinate) **Dosage Form:** Powder for Injection **Strength:** 3.5 mg per vial **Usual dose:** 1.25 mg/m^2 **Calculated Dose:** 2 mg (0.57 mL) under the skin twice daily **TO** 2.5 mg (0.7 mL) under the skin twice daily	**Failure Mode: Incorrect Product Ordered/ Selected/Dispensed or Administered because of Name confusion** **Causes (could be multiple)**	**Prevention of Failure Mode** **In the conditions outlined below, the following combination of factors, are expected to minimize the risk of confusion between these two names**
9.	Tysabri Injection (Natalizumab) Dosage form: Solution for Injection Strength: 300 mg/15 mL Usual dose: Administer 300 mg intravenously over 1 hour every 4 weeks	Orthographic similarity to Synribo When scripted the letter string 'Syn' may look similar to 'Tys'. Additionally, the names are similar in length. Dosage form Both products are available as a single dosage form. Thus the dosage form maybe omitted when prescribed. Route of administration Similar routes of administration, subcutaneous vs. intravenous. Strength Both products are available in a single strength, thus strength may be omitted when prescribed.	Orthographic differences When scripted the letter 'ribo' looks different from 'abri'. The upstroke in the letter string 'ribo' appears in the third position whereas in 'abri' the upstroke appears in the second position.

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

/s/

KEVIN WRIGHT
09/21/2012

YELENA L MASLOV
09/21/2012

CAROL A HOLQUIST
09/21/2012

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:	June 28, 2012
Reviewer:	Sarah K. Vee, PharmD, Safety Evaluator Division of Medication Prevention and Analysis
Team Leader	Yelena Maslov, PharmD, Acting Team Leader Division of Medication Prevention and Analysis
Deputy Director	Kellie Taylor, PharmD, MPH Division of Medication Prevention and Analysis
Division Director	Carol A. Holquist, RPh Division of Medication Prevention and Analysis
Drug Name(s) and Strength(s):	Omasona (Omacetaxine) powder for injection 3.5 mg/vial
Application Type/Number:	NDA 203585
Applicant/Sponsor:	Cephalon, Inc.
OSE RCM #:	2012-811

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

30 Pages have been Withheld in Full as B4 (CCI/TS) Immediately Following this Page

---

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

/s/

SARAH K VEE
06/28/2012

YELENA L MASLOV
06/28/2012

KELLIE A TAYLOR
06/28/2012

CAROL A HOLQUIST
06/28/2012