

Filed on behalf of: Mylan Pharmaceuticals Inc.

By: Steven W. Parmelee

Michael T. Rosato

Jad A. Mills

WILSON SONSINI GOODRICH & ROSATI

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

MYLAN PHARMACEUTICALS INC.,  
Petitioner,

v.

Bayer Intellectual Property GmbH,  
Patent Owner.

---

Case No. IPR2017-00042

Patent No. 7,585,860

---

**PETITION FOR INTER PARTES REVIEW  
OF U.S. PATENT NO. 7,585,860**

## TABLE OF CONTENTS

	<u>Page</u>
I.INTRODUCTION.....	1
A.    BRIEF OVERVIEW OF THE '860 PATENT .....	1
B.    BRIEF OVERVIEW OF THE PROSECUTION HISTORY .....	6
C.    BRIEF OVERVIEW OF THE SCOPE AND CONTENT OF THE PRIOR ART.....	6
D.    BRIEF OVERVIEW OF THE LEVEL OF SKILL IN THE ART.....	6
II.GROUNDS FOR STANDING .....	17
III.MANDATORY NOTICES UNDER 37 C.F.R. § 42.8 .....	18
IV.STATEMENT OF THE PRECISE RELIEF REQUESTED .....	19
V.CLAIM CONSTRUCTION .....	19
VI.BACKGROUND KNOWLEDGE IN THE ART PRIOR TO DECEMBER 24, 1999 .....	19
VII.DETAILED EXPLANATION OF GROUNDS FOR UNPATENTABILITY .....	20
A.    [Ground 1] Claim 1 is Obvious Under 35 U.S.C. § 103 Over Ewing, Riedl, the '111 Publication and Chiba.....	27
VIII.CONCLUSION.....	43
IX.CERTIFICATE OF COMPLIANCE.....	44
X.PAYMENT OF FEES UNDER 37 C.F.R. §§ 42.15(A) AND 42.103.....	45
XI.APPENDIX – LIST OF EXHIBITS .....	46

## I. INTRODUCTION

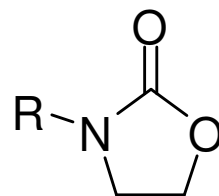
Mylan Pharmaceuticals Inc. (“Petitioner”) requests *inter partes* review of U.S. Patent No. 7,585,860 to Straub *et al.* (“the ’860 patent,” EX1001), which issued on September 8, 2009. PTO records indicate the ’860 patent is currently assigned to Bayer Intellectual Property GmbH (“Patent Owner”). This petition demonstrates that there is a reasonable likelihood that claim 1 of the ’860 patent is unpatentable over the asserted prior art. Additional petitions are also being filed to address U.S. Patent Nos. 7,157,456 and 7,592,339, over both of which the ’860 is terminally disclaimed.

Multiple enzymes are involved in the blood clotting cascade, but one protein known as “factor X,” via its active form, “Xa,” is called upon at an essential point in both the intrinsic and extrinsic coagulation pathways. EX1014 at 6630. Claim 1 of the ’860 patent is directed to a compound or hydrate thereof that is described in the patent as being able to bind to and inhibit factor Xa. The crystal structure of factor Xa was known, and the art had established the presence of dual binding pockets for inhibitors, termed the S1 and S4 pockets, on factor Xa. *Id.*; *see also* EX1015 at 390. The S1 pocket was recognized as a narrow cleft that bound planar aromatic groups, while the S4 pocket was less selective, binding not only planar

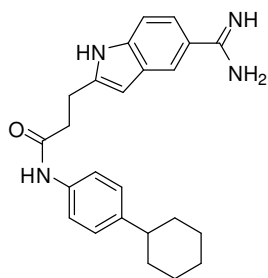
aromatic groups but also non-aromatic rings with heteroatoms, such as nitrogen and oxygen. *Id.*

Based on the detailed knowledge of the factor Xa binding pockets, the art had designed dozens of compounds which fit into these pockets and showed potent inhibition of factor Xa. *See generally*, Ewing, EX1007. What these compounds lacked was not potency, but favorable pharmacokinetic profiles. *Id.* Oral bioavailability was especially sought after, as the art needed new, safe and effective, orally-active anticoagulants. *Id.* Many viewed factor Xa inhibitors as attractive drug targets for developing effective oral anticoagulants. *Id.*

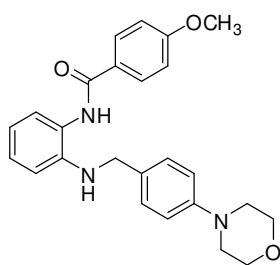
Oxazolidinones are a class of compounds comprising a 5-membered heterocycle (shown), and had long been known in the art to have various pharmacologic activities. EX1008. The art described oxazolidinone compounds that inhibited platelet aggregation, and were said to be useful in the treatment of thrombosis and myocardial infarction. *Id.* The “most advanced” oxazolidinone compound, linezolid, was known to have very desirable pharmacokinetic and pharmacologic properties, including high oral bioavailability and patient tolerability. *Id.* at 626-27. Linezolid was safe in humans and had entered Phase III human clinical trials for antimicrobial uses.



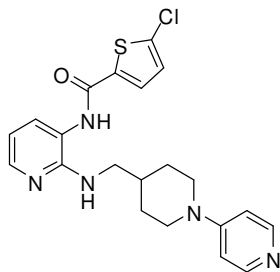
It was known that oxazolidinone-based antibiotics could have dual uses for other indications, and that they could be optimized for other therapeutic activities, including as anti-depressants or as anticoagulants. EX1008 at 630; EX1018 at 136. Linezolid's 4'-morpholinophenyl arm was a known factor Xa binding moiety, and was present on a factor Xa inhibitor disclosed in Example 1 of PCT WO 00/39111 (the '111 publication, EX1009). This binding moiety is structurally similar to the 4-cyclohexyl phenyl moiety found on Ewing's Compound 49, also a factor Xa inhibitor. EX1007 at 782. Linezolid, Ewing Compound 49, and Examples 1 and 7 of the '111 publication (shown below), have a two-arm shape and structure consistent with providing a binding moiety for each of the two known binding pockets of factor Xa. *Id.*; EX1008 at 626 (Compound 1); EX1009, 39:1-5; EX1010, 0043:1-5.



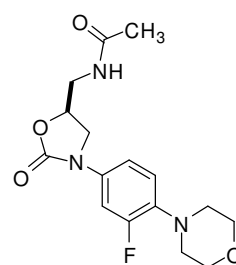
Ewing, EX1007  
Compound 49



The '111 Publication; EX1009  
Example 1



The '111 Publication; EX1009  
Example 7



Riedl, EX1008  
Linezolid

Given linezolid's general shape, its 4'-morpholinophenyl arm that was already a known factor Xa binding moiety (*supra*, EX1009), and its excellent

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.