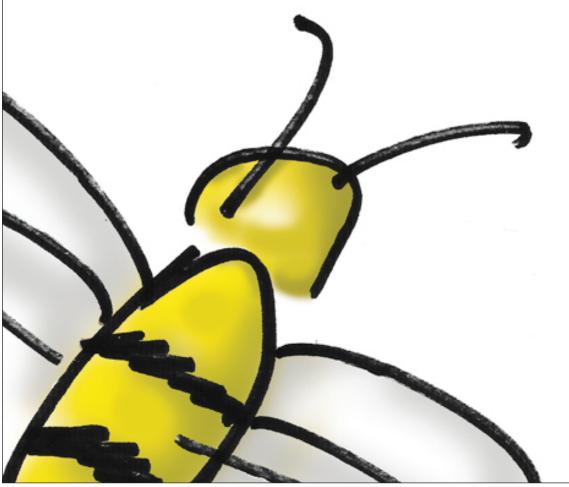
## Cold Chain Chronicles

A practitioners outside-the-box perspectives on the importance of temperature-sensitive drug stewardship

Kevin O'Donnell



# Cold Chain Chronicles

A practitioner's outside-the-box perspectives on the importance of temperature-sensitive stewardship

Kevin O'Donnell

PDA
Bethesda, MD, USA
DHI Publishing, LLC
River Grove, IL, USA

#### 10 9 8 7 6 5 4 3 2 1

ISBN: 1-933722-82-7

Copyright © 2014 Kevin O'Donnell Cover illustration created and provided by courtesy of Dr. Hamdi Ümit Kartoglu All rights reserved.

All rights reserved. This book is protected by copyright. No part of it may be reproduced, stored in a retrieval system or transmitted in any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from the publisher. Printed in the United States of America.

Where a product trademark, registration mark, or other protected mark is made in the text, ownership of the mark remains with the lawful owner of the mark. No claim, intentional or otherwise, is made by reference to any such marks in the book. Websites cited are current at the time of publication. The authors have made every effort to provide accurate citations. If there are any omissions, please contact the publisher.

While every effort has been made by the publisher and the authors to ensure the accuracy of the information expressed in this book, the organization accepts no responsibility for errors or omissions. The views expressed in this book are those of the editors and authors and may not represent those of either Davis Healthcare International or the PDA, its officers, or directors.



Connecting People, Science and Regulation®



This book is printed on sustainable resource paper approved by the Forest Stewardship Council. The printer, Gasch Printing, is a member of the Green Press Initiative and all paper used is from SFI (Sustainable Forest Initiative) certified mills.

#### **PDA Global Headquarters**

Bethesda Towers, Suite 150 4350 East-West Highway Bethesda, MD 20814 United States www.pda.org/bookstore 001-301-986-0293

#### Davis Healthcare International Publishing, LLC

2636 West Street
River Grove
IL 60171
United States
www.DHIBooks.com

### **CONTENTS**

Foreword		v	
Int	Introduction		
Section I			
Exploiting the Genius of Nature in Packaging		I	
I	Of Beetles, Bees, and Butterflies	3	
2	Magic Mushrooms	- 11	
3	Got Silk?	17	
Se	ection 2		
Sn	Small World, Big Challenges		
4	Welcome to Yakutsk! The Coldest City on Earth	23	
5	Swiss Watches and Insulating Packages	29	
6	Lake Superior: The World's Largest Gel Pack	35	
		iii	

IV	Cold Chain Chronicles	
	ction 3 andards That Aren't	4
7	How Frozen is Frozen?	4
8	Defining Cold	5
9	Buddy, Can You Spare a Pain Reliever?	5
10	A Year in the Life of a Vaccine	6
Se	ction 4	
Hope or Hype		
П	Refrigeration Without Electricity	7
12	No Deposit, No Return	8
13	Pharming: A Bountiful Harvest	8
14	Facts and Myths About Expanded Polystyrene	9
15	Plastics of the Future	10
Se	ction 5	
It's Not Just Cold Chain; It's Personal		- 11
16	There Once Was A Woman From Pleasanttown	П
17	Captain Cold Chain to the Rescue!	12
18	Degrees of Attitude	12

Unsung Heroes of the Final Mile		135
19	A Sled-Dog, a Bacterium, and a Drug Company	137
20	An Urban Doctor's Patient-level Crusade	141
21	A Family Tragedy	147
Acknowledgments		153
Biographies		157
Additional Resources		159
References		163

Section 6