

Innovative New Preservative System

In-Cosmetics 2014

Hamburg, DE

Presenter: Glenn Gutkowski



Vivimed

Agenda

- Introduction
- Regulatory / Marketing Pressure
 - Currently Effective
 - Methyl Isothiazolinone
 - DMDM Hydantoin
 - Parabens
- Vivimed Development
 - Viv-GMU
 - Cosvat
 - Vivisept CVT
 - Description
 - Double Challenge results
- Conclusion



Introduction

- Market changes are driving preservative choices globally
- In the internet age, blogs, NGO websites and e-news blasts influence public perception about the efficacy of chemical ingredients
 - Positively and Negatively
 - Prone to creating an atmosphere of fear
- The most effective preservatives are under assault whether the negative attributes are real or perceived



Regulatory and Marketing Pressure

Pros and Cons

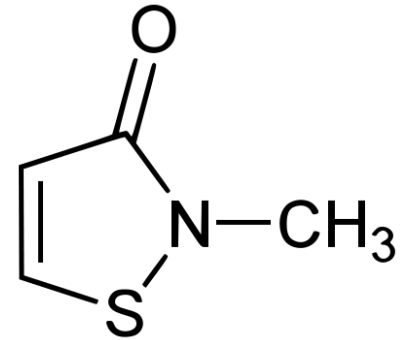
- Methyl Isothiazolinone

- Pros

- Effective at low concentrations
- Effective over a wide pH range (4-8)
- Type of preservation
 - Bactericide
 - Little to no fungicidal effectiveness

- Cons

- Water pollutant
- Contact allergen / irritant / sensitizer



**Cosmetics causing an epidemic of allergies
Doctors urge firms to remove preservatives
from products**

- Chemical methylisothiazolinone (MI) can cause severe skin reactions
- Several cosmetics companies are removing the chemical urgently
- Allergic reaction rate to MI is ten per cent, normal is one to two per cent

Mail Online, UK 17 Sept 2013



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Regulatory and Marketing Pressure

Pros and Cons

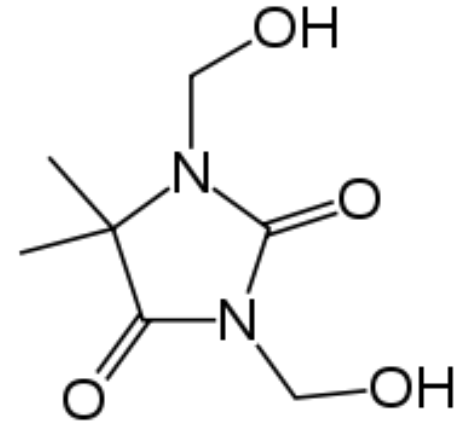
- DMDM Hydantoin

- Pros

- Effective at low concentrations
- Effective over a wide pH range (4-9)
- Type of preservation
 - Bactericide
 - Little to no fungicidal effectiveness

- Cons

- Formaldehyde releaser
- Contact allergen / irritant / sensitizer



Regulatory and Marketing Pressure

Pros and Cons

- Parabens

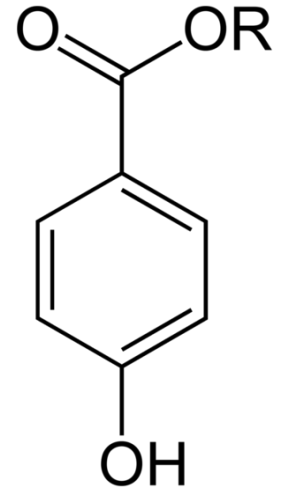
- Pros

- Effective at low concentrations
- Effective over a wide pH range (4-9)
- Type of preservation
 - Weak bactericidal effectiveness
 - Fungicide

- Cons

- In a published study,
 - Shown weak estrogen-like properties
 - Linked to breast cancer in a published study

<<subsequent studies concluded an implausible estrogenic risk associated with parabens>>



Regulatory and Marketing Pressure

- Limited development of new preservatives
 - Cost of development
 - Regulatory Hurdles
 - REACH
 - BPD
 - EPA
 - formulators are reluctant to change unless regulatory changes mandate

Designed to “kill” and it is not beyond conception that there is the risk of adverse effects being associated with preservatives especially with toxicological testing being dependent on microbial and human cell systems

- New developments focused on combinational chemistries of existing preservatives and natural chemistries



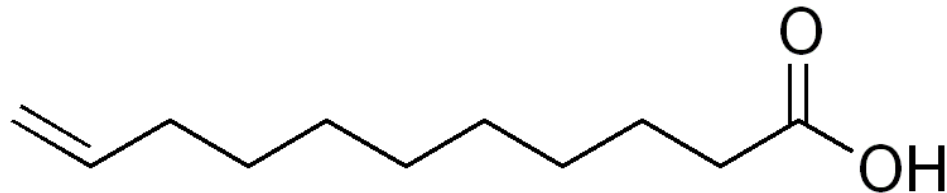
Vivimed Development

- Vivimed developments use the Glyceryl monoesters as a chassis
 - Kabara first discovered the monoester content Glyceryl esters have anti-microbial / anti-fungal properties
 - Work centered on glyceryl laurate
 - Applicable to other glyceryl esters including
 - Caprate (C8)
 - Caprylate (C10)
 - Undecylenate (C11)



Vivimed Development

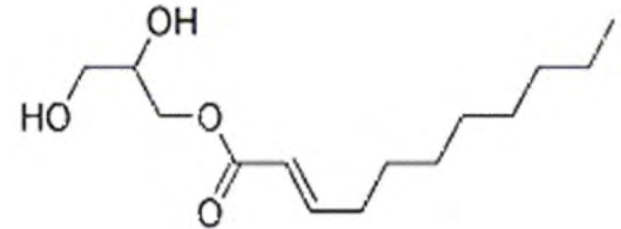
- Undecylenic acid
 - Derived from Castor Oil
 - Powerful antifungal agent for a variety of pathogenic fungi
 - FDA-approved for over-the-counter medications for
 - skin disorders or
 - skin problems
 - Relieves itching, burning and irritation
 - Low toxicity
 - Weak anti-microbial action compared to traditional preservatives



- Undecylenic acid (cont.)

- Esterification with glycerine increases antimicrobial activity (glyceryl undecylenate)

- Higher activity than the free acid form
- Compares favorably with parabens, sorbic acid, dehydroacetic acid
- Usage over a broader pH range



- Free acid preservatives general effectiveness constrained to acidic pH ($pK_a < 7$); glyceryl esters not constrained to acidic pK_a
- Glyceryl esters effective pH= 4-9, optimal at 7-7.5
- Effective against gram (+), yeasts, molds and fungus
 - » MIC gram (+) = 250 $\mu\text{g/ml}$
 - » MIC Fungi and yeasts = 500 $\mu\text{g/ml}$
 - » MIC molds = 250 $\mu\text{g/ml}$
- Weak effectiveness against gram (-)
 - » MIC gram (-) = 5,000 – 10,000 $\mu\text{g/ml}$



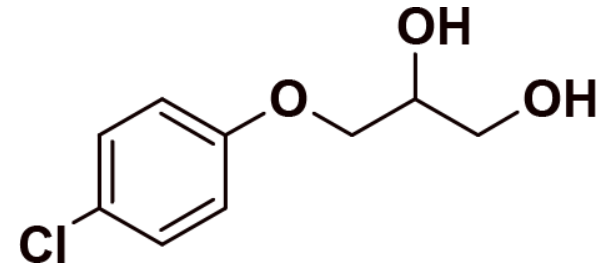
- Undecylenic acid (cont.)
 - Esterification with glycerine increases antimicrobial activity (glyceryl undecylenate) (cont.)
 - Glyceryl esters considered “generally recognized as safe and effective” (GRASE)
 - Compatible with most emulsifiers
 - deactivated by sodium lauryl sarcosine, ethoxylated and propoxylated nonionics (polysorbates)
 - An emollient with anti-bacterial properties



COSVAT

- Chlorphenesin

- Potent anti-bacterial and anti-fungal agent
- Low toxicity
- Optimum pH= 5 – 7
- Effective against gram (+), gram (-), yeasts, molds and fungus
 - » MIC gram (+) = 1250 ppm
 - » MIC gram (-) = 2500 ppm
 - » MIC Fungi and yeasts = 1250 ppm
 - » MIC molds = 2500 ppm
- <<deactivated by polysorbates>>



Vivisept CVT

- Vivisept CVT (INCI name: glyceryl undecylenate (and) propylene glycol (and) chlorphenesin)
 - Broad spectrum preservative
 - Light colored liquid
 - Easy to use, effective
 - Pre-add
 - Post-add
 - Usage level 1-1.5%
 - Effective over a wide range (pH=4-9) optimally 5-8
 - Comparable to parabens/phenoxyethanol
 - Mild, low irritancy
 - Patent pending



Vivisept CVT

Microbiological efficacy of Vivisept CVT in comparison to commonly used synthetic preservatives.

	Vivisept CVT	Parabens	PE*	MIT*
<i>S.aureus</i>	✓	✓		✓
<i>E.coli</i>	✓		✓	✓
<i>P.aeruginosa</i>	✓		✓	✓
<i>C.albicans</i>	✓	✓		
<i>A.brasiliensis</i>	✓	✓		

Technical Data

Product:	Vivisept CVT
INCI:	Glyceryl Undecylenate (and) Chlorphenesin (and) Propylene Glycol
CAS:	65684-27-7 (123759-97-7), 104-29-0, 57-55-6
Appearance:	Colourless to pale yellow liquid
SG:	1.05-1.08g/l
Solubility:	Oil soluble
Suitable PH range:	4-9



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Vivisept CVT

Double Challenge test <USP51>*

- The formula

PRODUCT: O/W EMULSION BASE FOR PRESERVATIVE STUDY

PURPOSE: BASE & PRESERVATIVE SAMPLE PREPARATION

	Phase	Ingredient	%
1	A	DEIONIZED WATER	78.20
2	A	KELTROL CG-SFT	0.30
3	A	GLYCERIN 99%	2.00
4	B	LIPOWAX D (Cetearyl alcohol (and) cetareth20)	2.25
5	B	SESAME OIL	3.00
6	B	LIPONATE GC	8.00
7	B	ULTRACHEM SHEA BUTTER	1.00
8	B	SAFFLOWER OIL	3.00
9	B	LIPOMULSE 165 (Glyceryl stearate and PEG 100 Stearate)	1.75

			1	2	3
10	A/B	PHASE A/B	98.50	98.50	98.50
11	C	VIVISEPT GC	1.00	0.00	0.00
12	C	VIVISEPT CVT	0.00	1.00	0.00
13	C	Me-paraben	0.00	0.00	0.30
13	C	Pr-paraben	0.00	0.00	0.10
13	C	Phenoxyethanol	0.00	0.00	0.75
14	D	HYDROMILK En-20 (Hydrolyzed milk protein-Arch)	0.25	0.25	0.25
15	D	CROTEIN A- PW (Hydrolyzed collagen-Croda)	0.25	0.25	0.25
16	E	TRIETHANOLAMINE (99%) TO PH 6.0-6.5	0.00	0.30	0.00
17	F	DEIONIZED WATER QS to	qs to 100	qs to 100	qs to 100
Total			100.0	100.0	100.0

Base formulated by Cosmetech Laboratories, Fairfield, NJ USA

*USP51 is equivalent to the CTFA/PCPC challenge test.

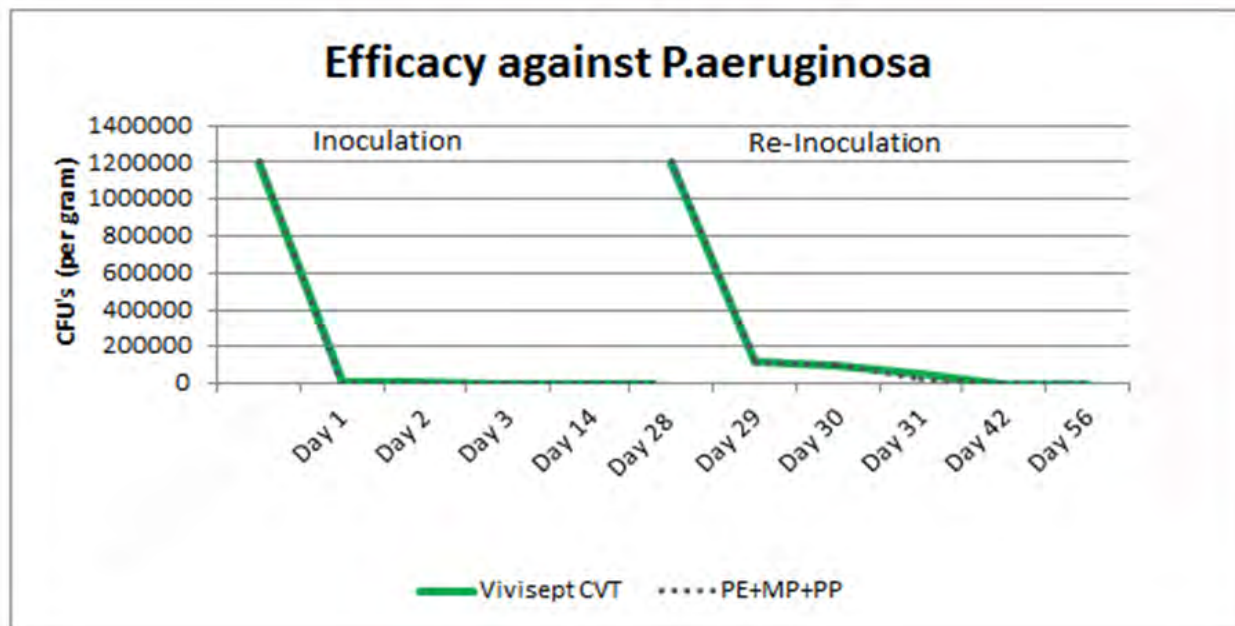


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Vivisept CVT

Double Challenge test <USP51>

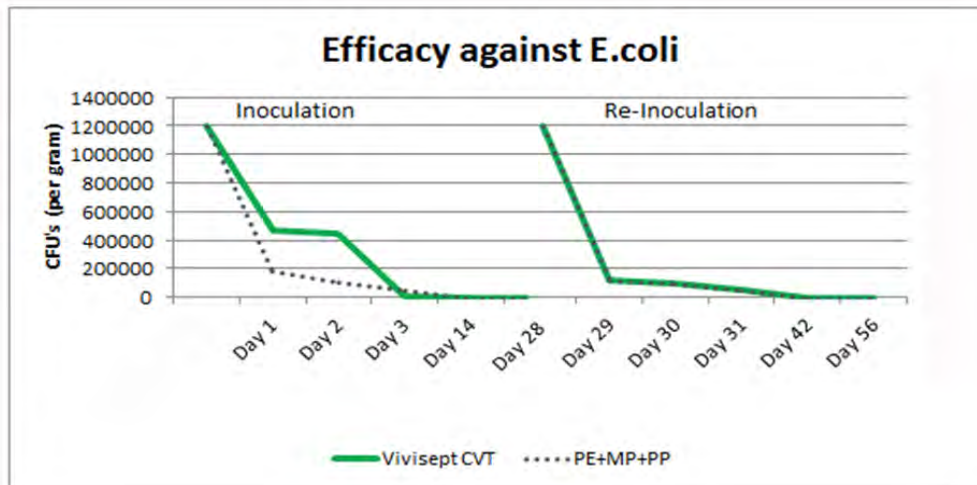
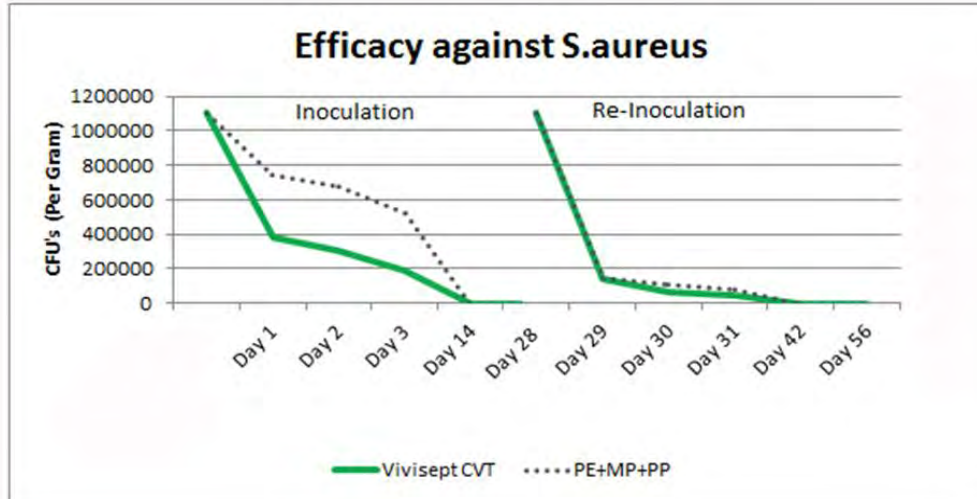
- Effectiveness against gram (-) versus Me-Paraben (0.3%), Propyl paraben (0.1%), Phenoxyethanol (0.75%)



Vivisept CVT

Double Challenge test <USP51>

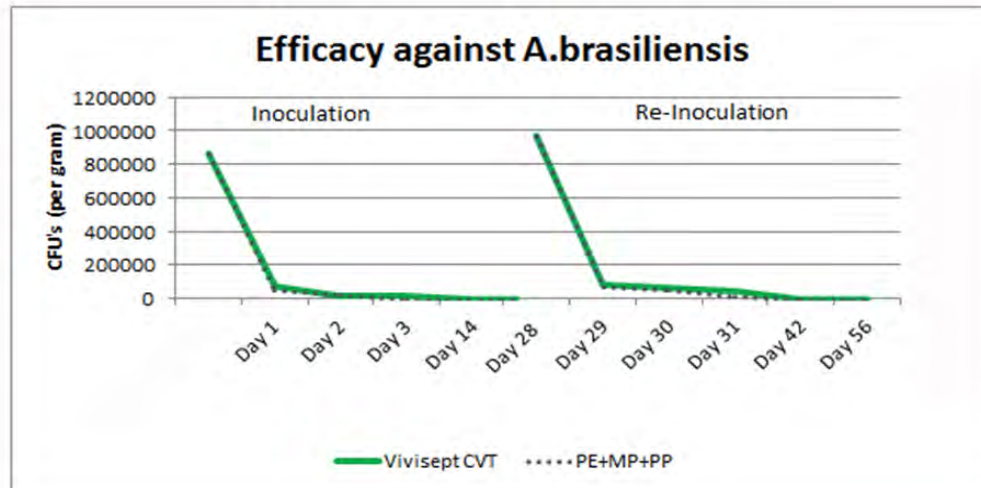
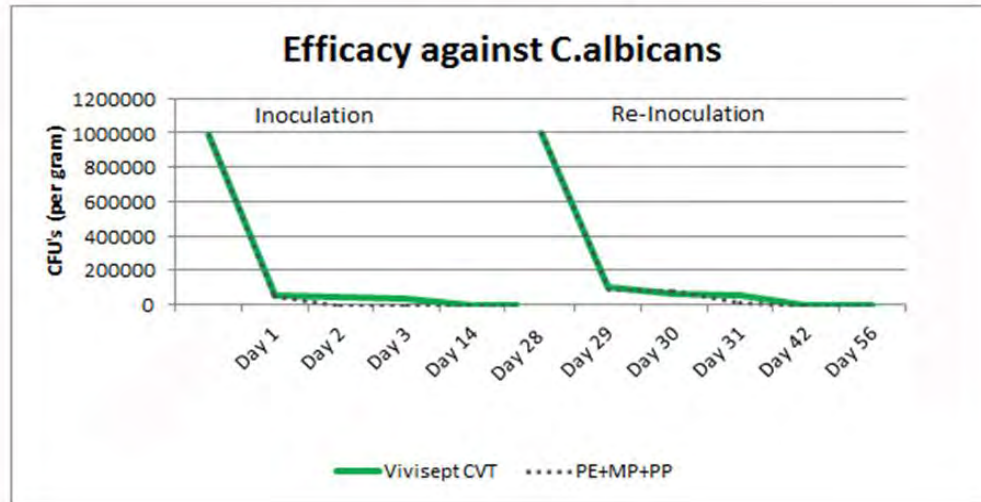
- Effectiveness against gram (+) versus Me-Paraben (0.3%), Pr-paraben (0.1%), Phenoxyethanol (0.75%)



Vivisept CVT

Double Challenge test <USP51>

- Effectiveness against fungus, yeasts and molds versus Me-Paraben (0.3%), Pr-paraben (0.1%), Phenoxyethanol (0.75%)



Regulatory

Viv-GMU <u>Glyceryl Undecylenate</u>	COSVAT <u>Chlorphenesin</u>	<u>Propylene glycol</u>
<p>CAS number : 65684-27-7 EU EINECS/ELINCS : Not listed, <1t/y without registration under REACH. US TSCA: Not listed Canada DSL/NDSL : Not listed China IECSC : Listed Japan ENCS : Not listed</p> <p>CAS number : 123759-97-7 EU EINECS/ELINCS : Not listed, <1t/y without registration under REACH. US TSCA: Not listed Canada DSL/NDSL : Not listed China IECSC : Not listed Japan ENCS : Not listed</p>	<p>CAS number : 104-29-0 EU EINECS/ELINCS : Listed. Registration deadline 2018 for VLE. US TSCA: Not listed Canada DSL/NDSL : Listed China IECSC : Listed Japan ENCS : Not listed</p> <p>Where 'not listed' is stated then substances may require notification by the importer and assessment before they can be imported. The amount of information depends on the tonnage. For Canada that the trigger limit is 100kg. For Japan a small volume exemption may be applicable for <1t/y with significant data requirements for 1-10t/y. Notification is to 3 authorities. If not listed on IECSC then the substance is subject to China REACH. A simplified notification is required for 100kg with a standard notification in the 1-10t/y band. Testing needs to be performed by laboratories in China.</p>	<p>CAS number : 57-55-6 EU EINECS/ELINCS : Listed. Registered under REACH by VLE. US TSCA: Listed Canada DSL/NDSL : Listed China IECSC : Listed Japan ENCS : Listed</p>

Conclusion

- Vivisept CVT (INCI name: glyceryl undecylenate (and) propylene glycol (and) chlorphenesin)
 - Broad spectrum preservative
 - Light colored liquid
 - Easy to use, effective
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Vivisept CVT is an efficient broad spectrum preservative with naturally derived emolliency. An effective alternative to parabens, phenoxyethanol, formaldehyde and isothiazolinone based preservative systems.



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Thank you!

- Questions??



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