

Potential of PTZ Shampoo Improves Dandruff/SD Efficacy

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Introduction: PTZ-Based Anti-Dandruff Shampoos

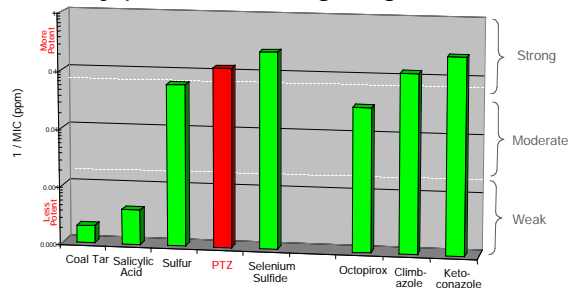
What is Pyrithione Zinc (PTZ)?



• A coordination complex between **zinc** and **pyrithione** in a 1:2 ratio

• It is sparingly soluble in water and shampoo product

▶ PTZ is a very potent anti-fungal against *Malassezia*:



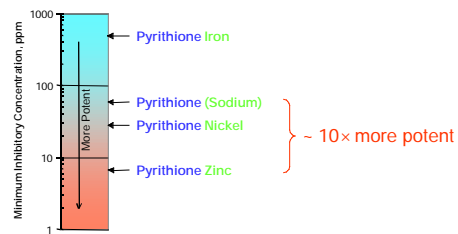
▶ Mechanism of PTZ anti-dandruff benefits:

• Primary mechanism is elimination of *Malassezia* causative agent

• Anti-irritancy activity also a source of benefit

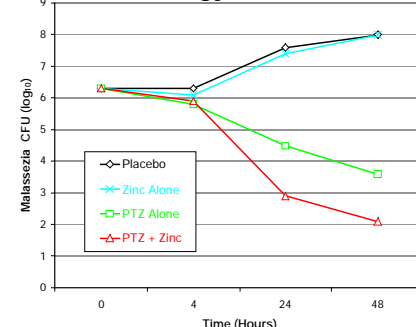
▶ Mechanism of PTZ fungal activity:

• Activity is strongly metal-dependent, showing zinc is critical to activity of PTZ:

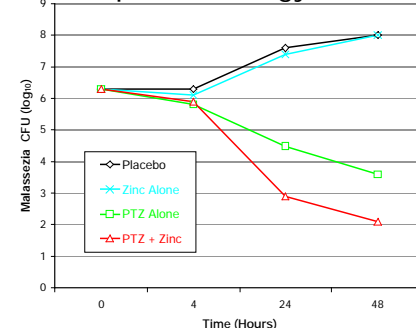


PTZ Activity can be Enhanced by Excipient Zinc

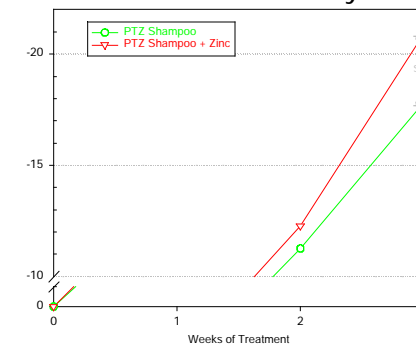
In vitro Microbiology:



In vivo Scalp Microbiology:

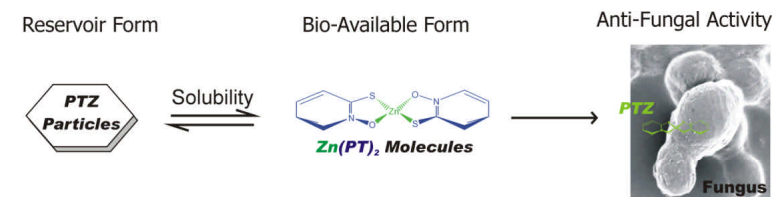


Clinical Anti-Dandruff Efficacy:

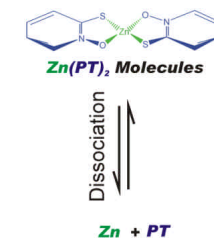


Mechanism of Zinc Potentiation of PTZ Activity

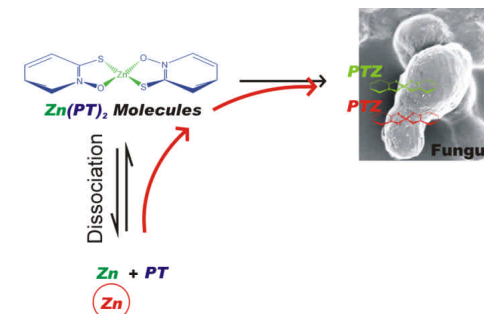
▶ The bio-active form of PTZ is the intact molecule:



▶ The PTZ molecule can dissociate to the less effective components **zinc** and **pyrithione**:

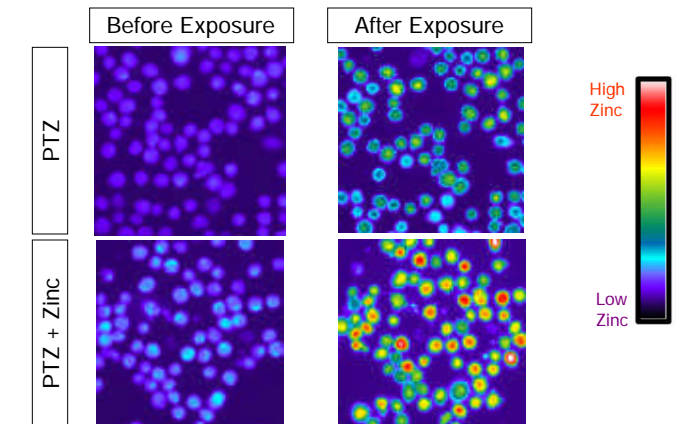


▶ Addition of **zinc** shifts the equilibrium back in the direction of the intact PTZ, thereby maximizing the amount of PTZ available:



Experimental Support for Potentiation Mechanism

▶ Quantitation of zinc transport into model cells demonstrates increased cellular delivery for the combination of PTZ + Zn:



Conclusions

- ▶ PTZ is a potent anti-fungal whose activity requires zinc
- ▶ Potentiation of PTZ shampoo with excipient zinc increases in vitro and in vivo anti-fungal activity and is manifested as improved anti-dandruff clinical efficacy
- ▶ The mechanism involves maintaining an equilibrium favorable to maximizing the bio-availability of PTZ

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