

Taking the Yeuch! out of Medicine

Dr L. Hughes

Rohm and Haas Research Laboratories

Spring House, Pa

email: lhughes@rohmmaas.com

Tel: 215 641 7329

Taking the Yeuch! out of Medicine

Or, how to avoid this...



Outline

- *Taste*
- *Technologies*
- *Dosage forms*
- *Evaluation*

Taste

“The ability to respond to dissolved molecules and ions in the mouth”



Why have a sense of taste?

- Drives Appetite – **a positive effect**
(eg sugar = carbohydrates, salt=electrolyte balance etc)
- Protects against poisons - **an aversive effect**
(poisons, spoiled food taste bad)

Taste Cell Categories

- **Salt** (pleasing or aversive eg NaCl)
- **Sour** (aversive eg acids)
- **Bitter** (aversive, eg many medicines)
- **Sweet** (pleasing eg sugar)
- **Umami** (pleasing eg meat)

Taste vs Flavor

Flavor includes:

- Taste
- Smell
- Texture
- Color
- Spicy
- Astringent

Unpleasant taste categories

- Salt
- Sour
- Bitter
- Oily



Taste-masking methods

Three ways:

- **Hide it**
- **Change it**
- **Reduce it**



Hide it !

Add flavors, usually syrups

- **Salty:** cinnamon, orange, cherry, citric acid, cocoa, raspberry
- **Bitter:** cocoa, raspberry, cherry, sarsaparilla, licorice, orange
- **Sour:** raspberry and other fruit syrups
- **Oily:** rhubarb, sarsaparilla, and lemon syrups; wintergreen and peppermint oils

Change it !

- **Change the salt form**

eg aspirin, Na salt is bitter, Mg salt is not

Chlorpheniramine maleate is better than the free base or other salts

- **Modify the taste buds**

eg menthol, sodium phenolate, and mint flavors anesthetize

Taste inhibitors – possible but limited

Reduce it !

- Ion exchange resin
- Encapsulation
- Cyclodextrins
- Viscosity/solvents
- Emulsification

Ion Exchange Resin

- An ionic complex of the drug and an insoluble polymer
- Little or no drug release in the mouth
- Drug is release in the GI tract
- Excellent for suspensions and Orally Disintegrating Tablets
- No leaching
- May not need to isolate the complex
- Resins are very safe
- Can be combined with other taste-masking techniques

Encapsulation

Coating

- Well established technology
- Susceptible to leaching in suspensions
- Coating can be damaged during processing

Wax matrix

- Encase drug in a wax
- Susceptible to leaching in suspensions

Soft-gel Liquid capsules

- Limits patient applicability

Gelling agents

- Encapsulation by precipitation of soluble polymers

Cyclodextrins

- Forms an inclusion complex
- Limited applicablity – drug and hole size must match
- Cyclodextrins are expensive

Viscosity/solvents

Viscosity

- Viscous liquid do not mix well with saliva
- Less exposure of the drug to the taste buds

Solvent

- Alcoholic solutions
- Less exposure of drug to the taste buds

Emulsification

- Useful for oils (eg castor oil)
- Use the syrups to make the emulsion

Dosage forms

- Liquid
- Lozenges/Troches
- Orally Disintegrating Tablets
- Films
- Tablets

Liquids

Flavoring

Ion Exchange Resin (suspensions)

- Commercially successful (Delsym, Tussionex, Paxil)
- Compatible with extended release or immediate release
- Drug should be ionizable

Encapsulation (suspensions)

- Susceptible to leaching
- Susceptible to damage during processing
- Compatible with extended release or immediate release

Gelling agents (suspensions)

Lozenges/troches

Flavoring

Ion exchange resin

- Commercially demonstrate (Nicotine lozenges)
- Compatible with extended release or immediate release

Coating

- Susceptible to damage during processing
- Compatible with extended release or immediate release
- Susceptible to damage during processing

ODT/films

Flavoring

Ion exchange resins

- Limited for films
- Compatible with extended release or immediate release
- Commercially successful (Zydis®)

Coating

- Limited for films
- Compatible with extended release or immediate release
- Susceptible to damage during processing

Tablets

Not often needed

Flavoring

Ion exchange resins

- Compatible with extended release or immediate release
- Commercially successful (Zydis®)

Coating

- Compatible with extended release or immediate release
- Susceptible to damage during processing

Evaluating taste-masking

- Taste panels
- Standard dissolution test not appropriate – short term kinetics are critical
- Electronic Tongue (eg Alpha MOS)
- Dynamic Buccal Dissolution Test (Rohm and Haas, US Patent)

Variability of taste

People's taste sensitivity varies

- 25% are 'super tasters' (more women than men)
- 50% are 'normal tasters'
- 25% are 'non-tasters'

Summary

- Taste masking improves patient compliance
- Several techniques available
- Flavoring is the commonest and cheapest
- Not all techniques work all the time
- Probably use a combination

If you get it right.....

...you'll change this.....



.....into this!

