

# SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

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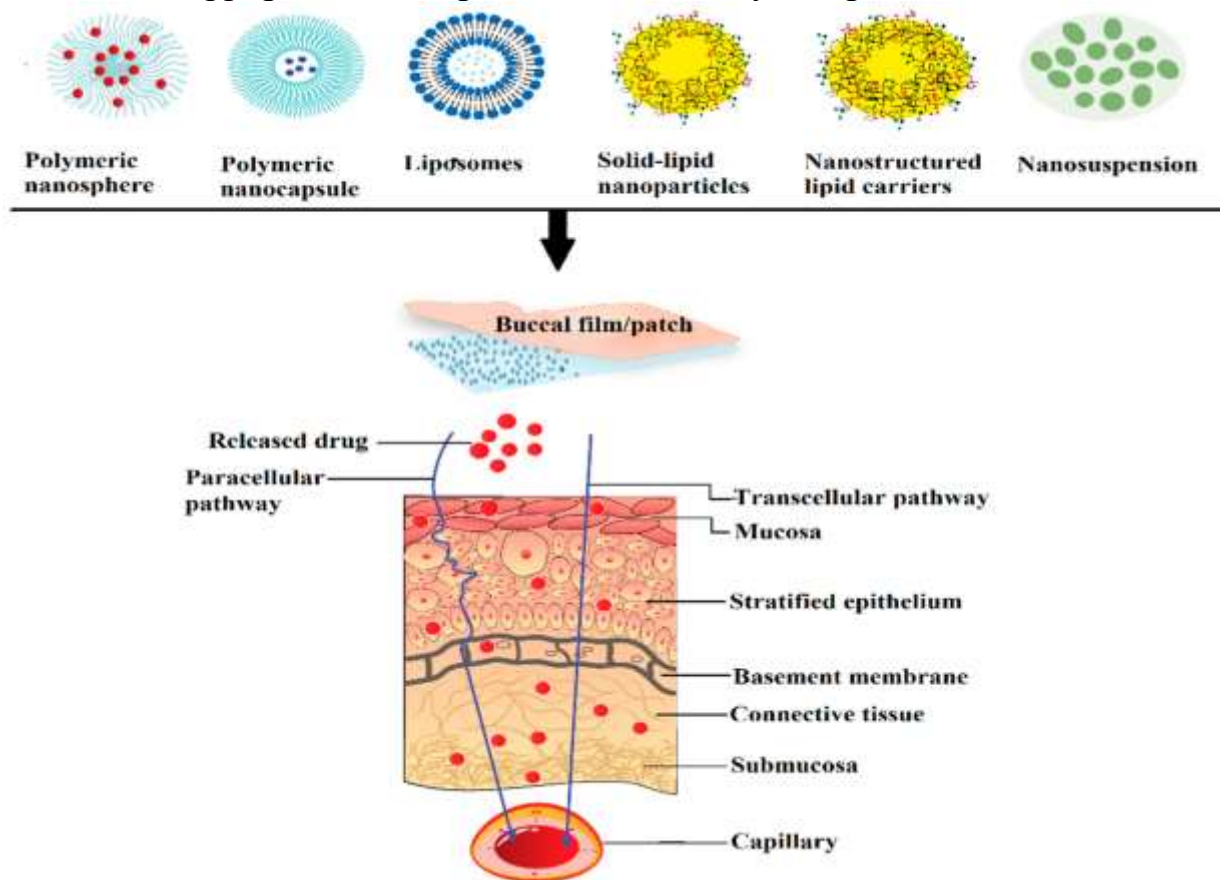
## UNIT 2 PUZZLES (PART II)

### TOPIC: BUCCAL DRUG DELIVERY SYSTEM

### SUBJECT: NOVEL DRUG DELIVERY SYSTEM

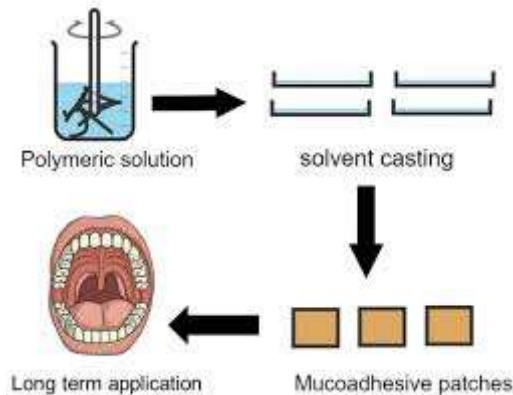
#### Case Study Puzzle 1: Nicotine Replacement Therapy Patch A

pharmaceutical company develops a **mucoadhesive buccal patch** for nicotine delivery to help smokers quit. The patch uses hydroxypropyl methylcellulose (HPMC) and carbopol for adhesion, with a backing layer to prevent drug release into saliva. In clinical trials, patients report good adhesion for 4-6 hours but occasional slippage after eating, and bioavailability is higher than oral tablets.



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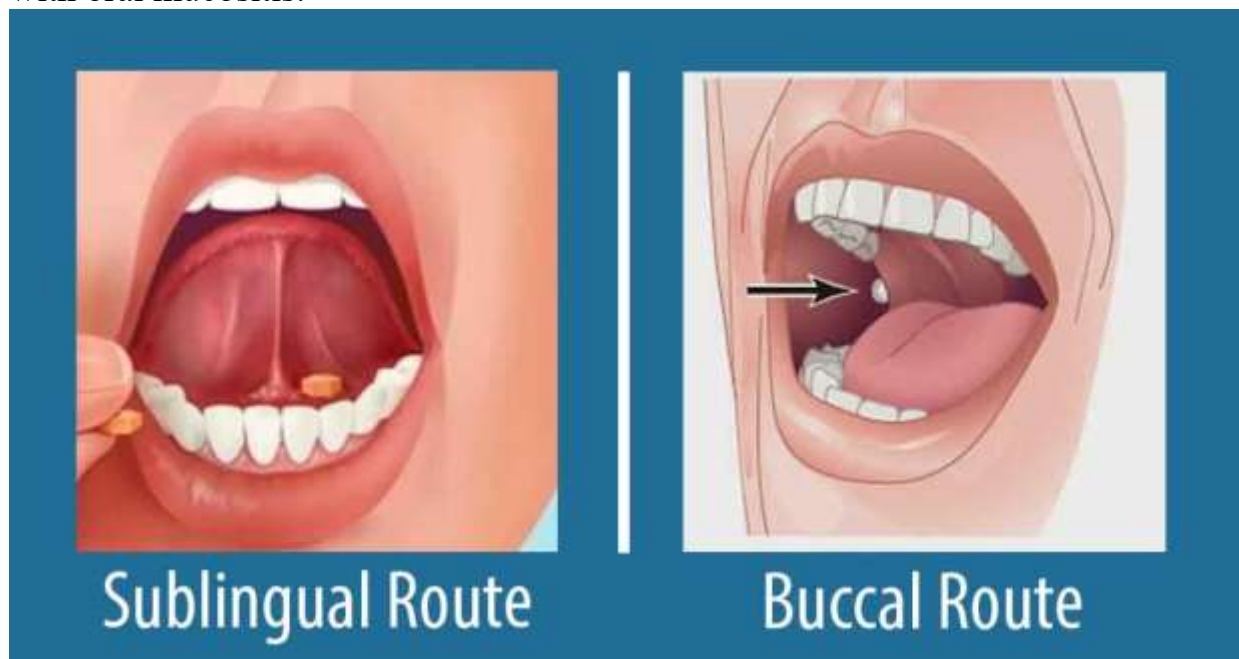
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## Questions:

1. Why does the backing layer improve efficacy?
2. What disadvantage causes slippage after eating, and how could formulation address it?
3. Which mucoadhesion principle is primarily involved with HPMC/carbopol polymers?

**Case Study Puzzle 2: Fentanyl Buccal Film for Cancer Pain** Onsolis® or Breakyl® is a marketed buccal film containing fentanyl (opioid) for breakthrough cancer pain. It's a small, dissolvable film applied to the inner cheek, providing rapid onset (15-30 min) via transmucosal absorption. The formulation includes penetration enhancers but warns against use in patients with oral mucositis.



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FORMULATION NAME	DOSAGE FORM	ACTIVE INGREDIENT(s)	INDICATION	MARKET STATUS
Ativan	Buccal Tablet	Lorazepam	Sedation	Marketed
Edluar	Buccal Tablet	Zolpidem	Insomnia	Sublingual Pharmaceuticals
Anginine	Buccal Spray	Glyceryl trinitrate (Nitroglycerin)	Angina	Marketed
Minirin Melt	Buccal Wafer	Desmopressin	Nocturia	Marketed
Suboxone	Buccal Film	Buprenorphine + Naloxone	Opioid dependence	Reckitt Benckiser
Saphris	Buccal Wafer	Asenapine	Schizophrenia	Marketed
Acyclovir Film	Buccal Film	Acyclovir	Viral infections	Not specified
Risperdal M-TAB	Buccal Tablet	Risperidone	Schizophrenia	Janssen Pharmaceuticals
Mucobeta	Buccal Wafer	Betamethasone	Inflammation	Not specified
Temgesic	Buccal Film	Buprenorphine	Analgesic	Not specified

ADHEXPHARMA LABTEC

Our oral film technologies

Mucofilm®



Rapidfilm®



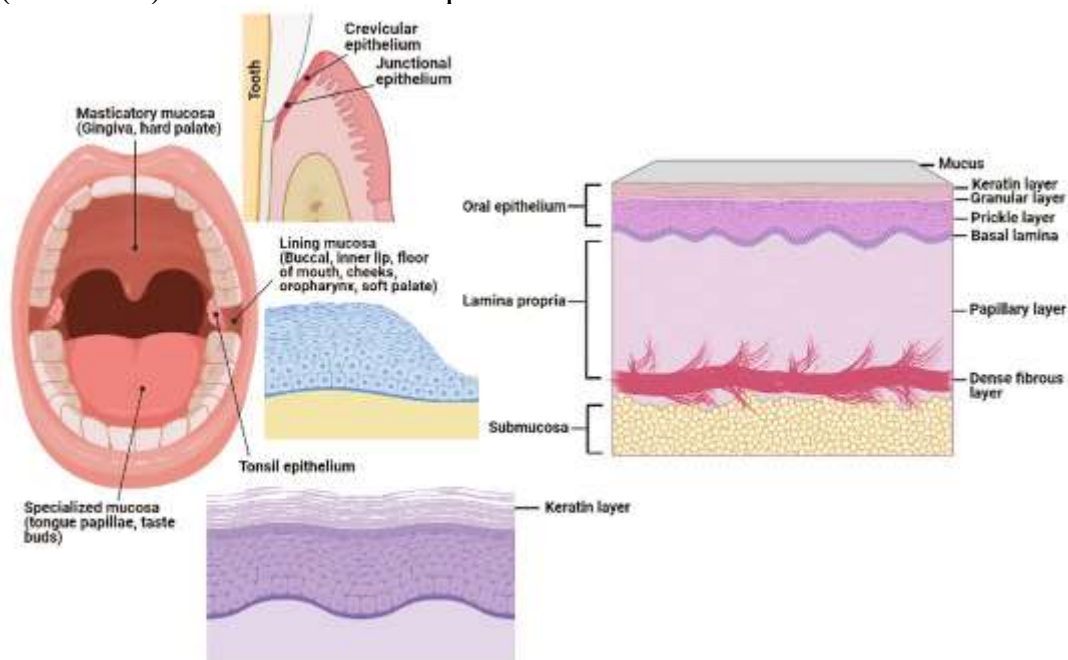
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## Questions:

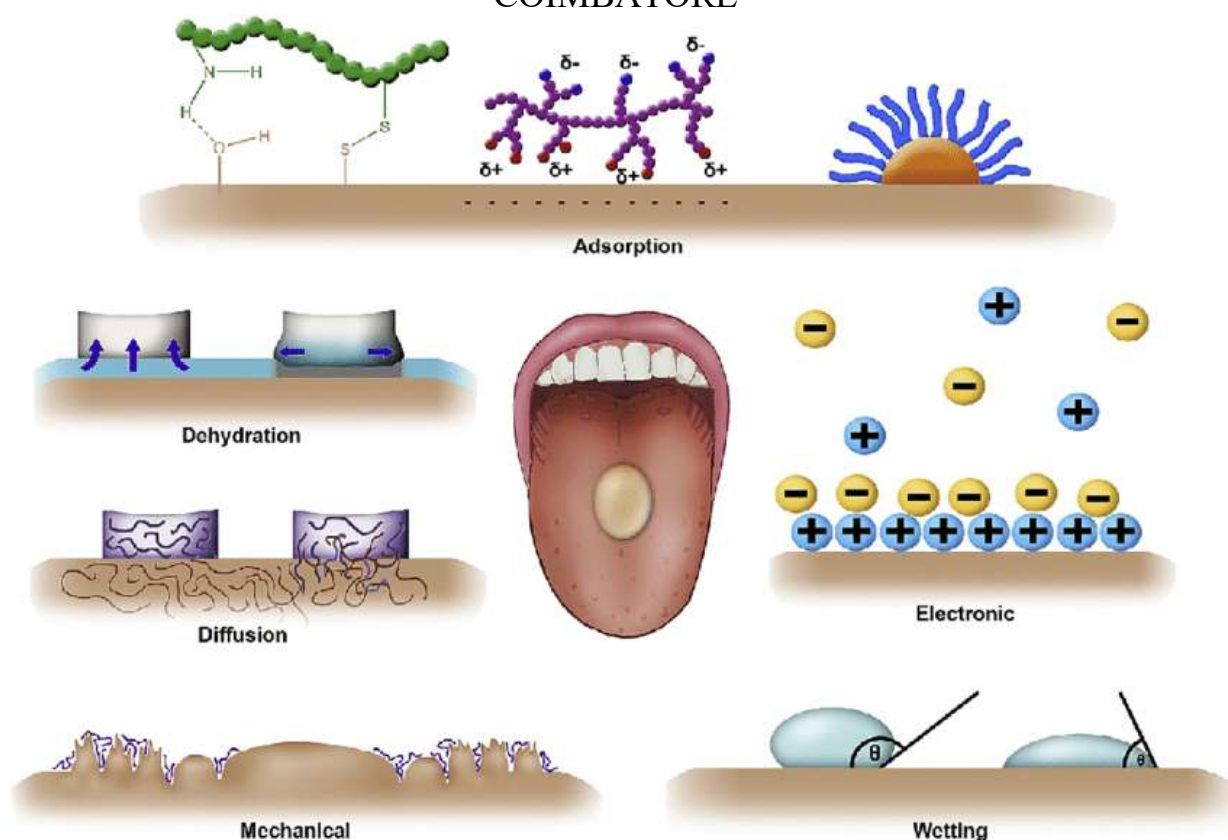
1. Why is buccal route preferred over oral for fentanyl?
2. What permeability pathway does fentanyl (lipophilic, low MW) mainly use?
3. Why is it contraindicated in mucositis?

**Case Study Puzzle 3: Insulin Buccal Delivery Challenge** Researchers formulate a buccal tablet for insulin using chitosan (cationic polymer) and sodium deoxycholate as enhancer. Ex vivo studies on porcine buccal mucosa show improved permeability, but in vivo human trials reveal low bioavailability (~10-15%) and variable absorption.



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Questions:

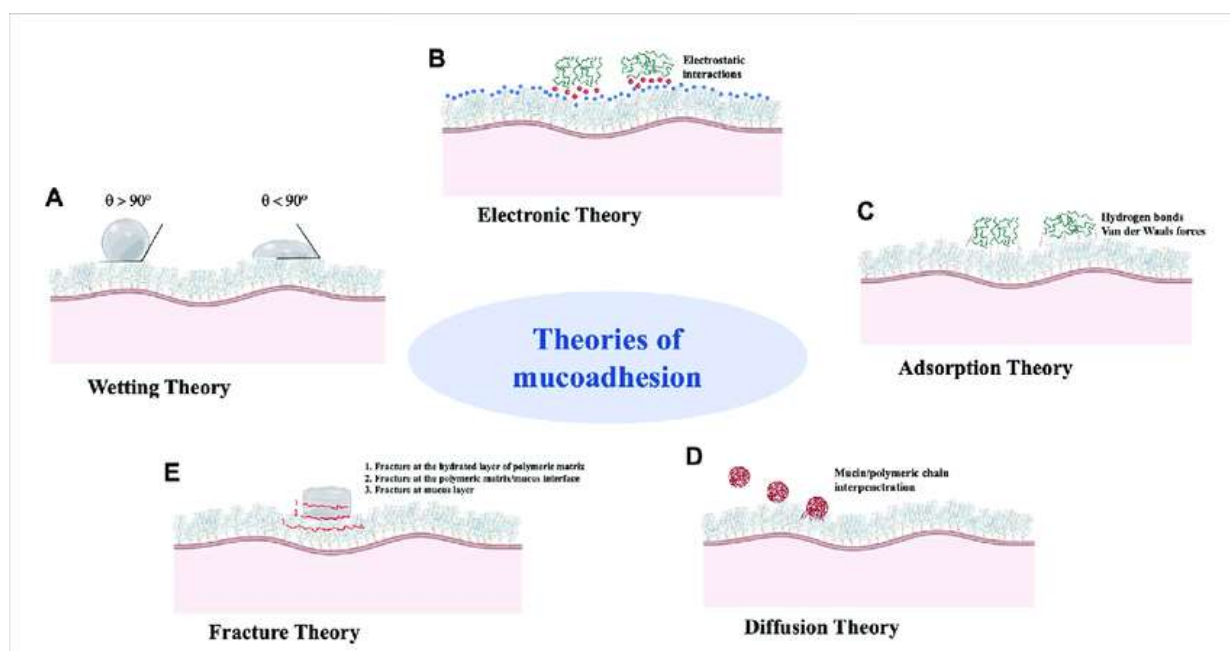
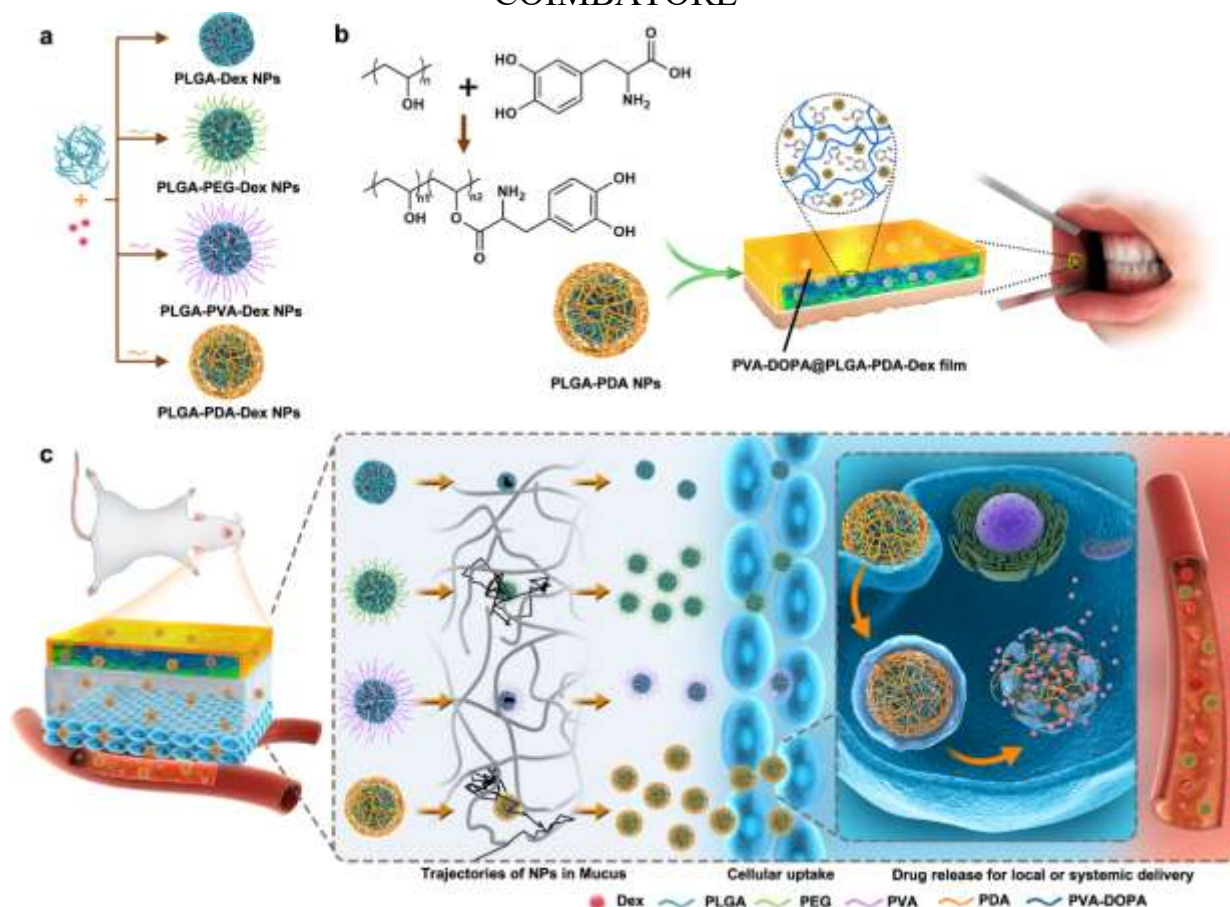
1. How does chitosan aid mucoadhesion and permeability?
2. What are two key disadvantages limiting insulin's buccal success?
3. Which theory best explains chitosan's enhancer effect?

**Case Study Puzzle 4: Progesterone Buccal Tablet for Hormone Therapy** A buccal tablet for progesterone (e.g., Striant®-like) uses polycarbophil for sustained release in menopausal therapy. It adheres well but patients complain of bitter taste and foreign body sensation.



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Questions:

1. Match the issue to advantage/disadvantage: Bitter taste and sensation vs. sustained release benefit.
2. Formulation fix for taste?
3. Why progesterone suits buccal (permeability factor)?