

Mucoadhesive Bilayer Vaginal Tablet As A Potential Treatment For Cervical Cancer

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What is cervical Cancer?

Cervical cancer is a cancer of the cells of the cervix
It is the 2nd most common cancer affecting women
>270,000 women die from it annually
>500,000 women worldwide are diagnosed¹

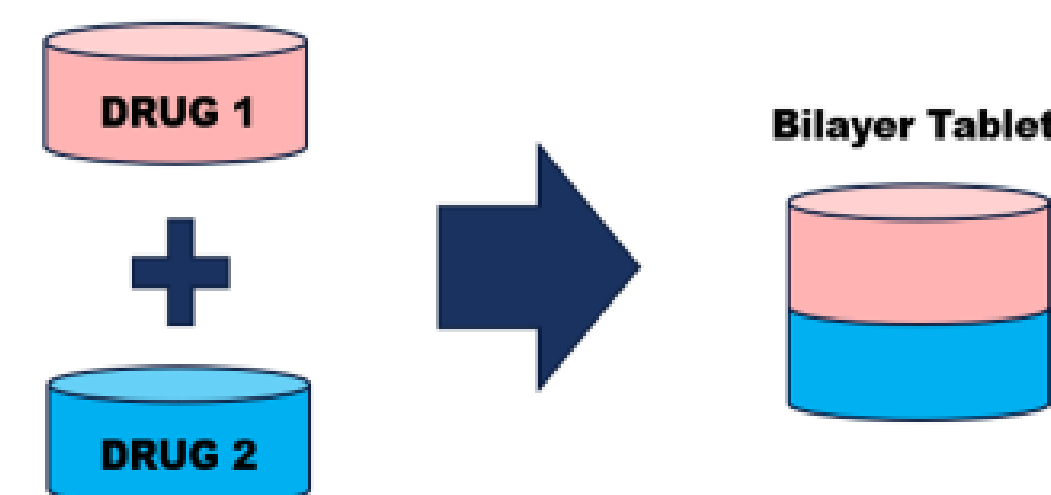
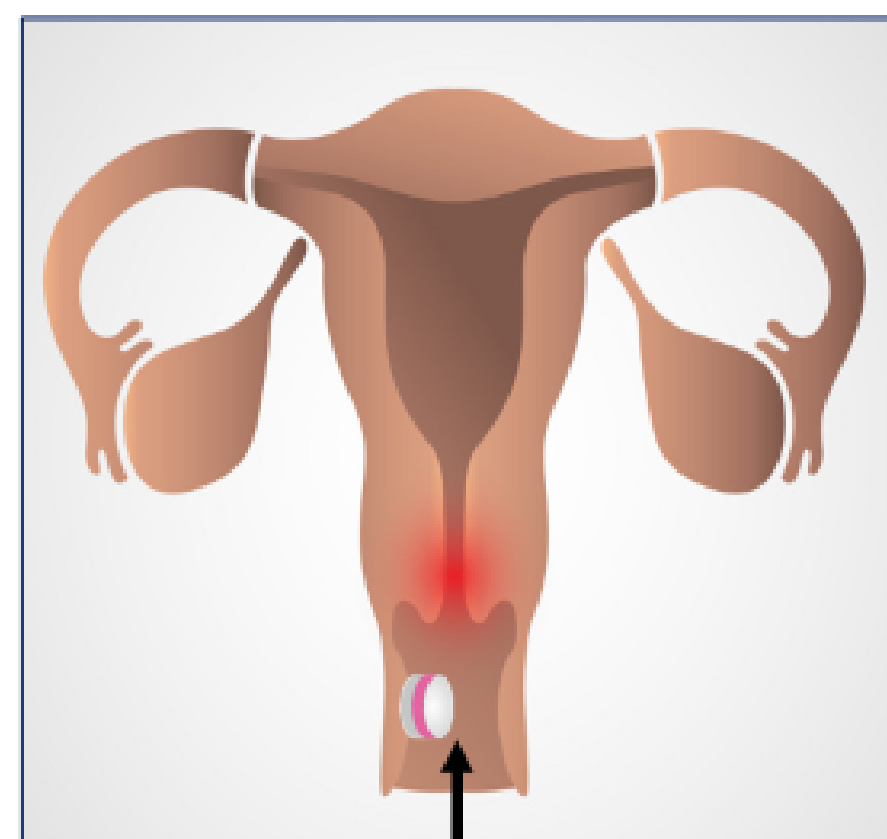
SYMPTOMS

- Abnormal vaginal bleeding or discharge
- Bleeding between regular menstrual periods, after menopause or after sexual intercourse
- Pelvic pain, pain during sexual intercourse or urination



RESEARCH AIM

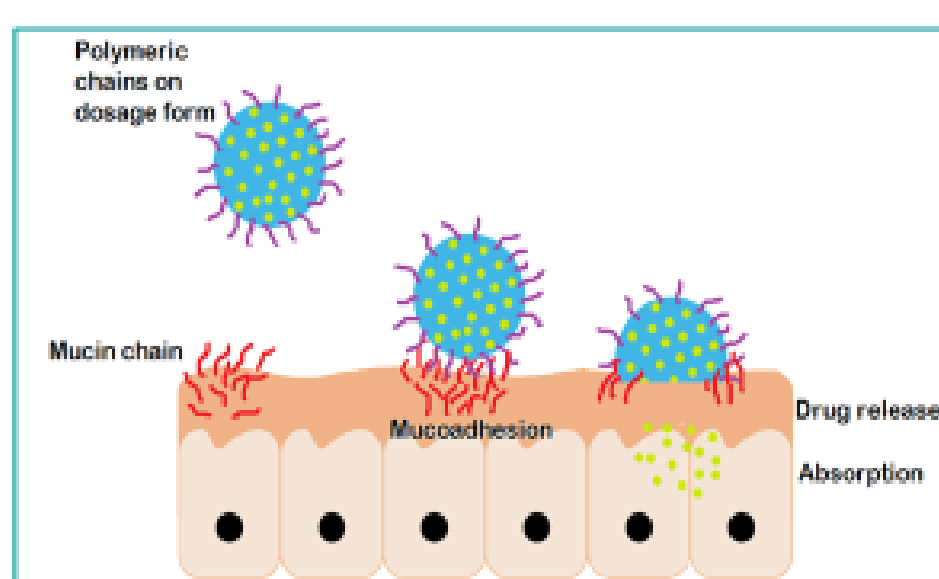
To develop a Mucoadhesive Bilayer Tablet



OBJECTIVE 1 : Vaginal drug delivery

- Location of cervix allows localized (direct) drug delivery⁵
- Does not effect other healthy cells in other parts of the body
- Avoids the first pass-effect
- Decreases systemic side effects⁶
- Self-administration is possible

OBJECTIVE 2 : Mucoadhesive Properties



- The tablet need to be mucoadhesive in order to bind to the vaginal mucus lining⁸
- Chitosan (CHN) and polyacrylic acid (PAA) was used⁹
- Both are non-toxic and non-irritating⁹

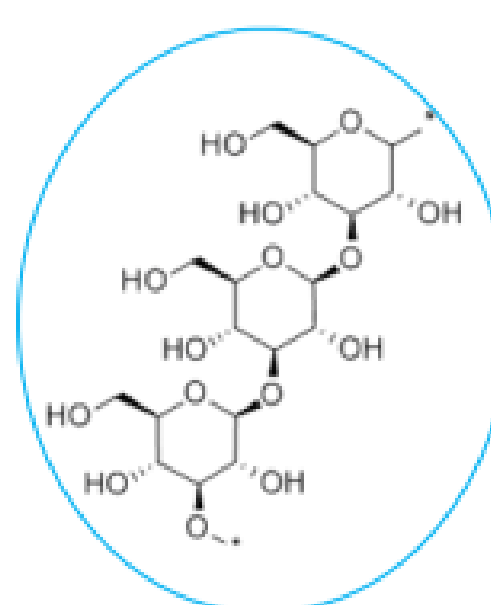
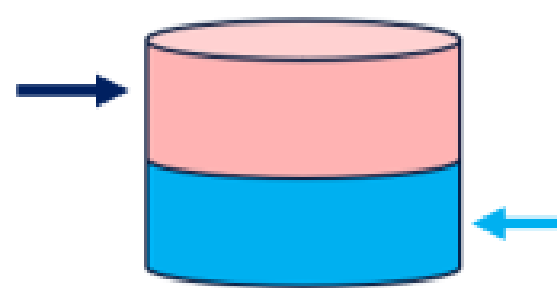
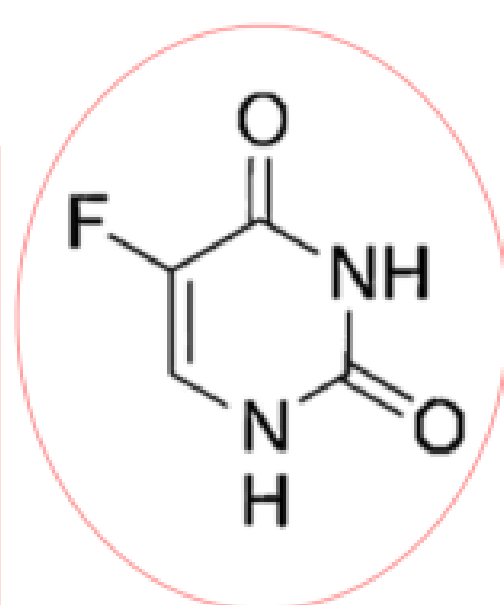
OBJECTIVE 3 : Drug Synergism

- Two or more drugs are given in combination.
- When combined effect is greater than that predicted by their individual potencies, the combination is said to be synergistic¹¹
- A synergistic interaction allows the use of lower doses of the drugs involved, which can help reduce the adverse reactions from the drugs¹¹
- Therefore, a bilayer tablet can deliver two drugs from a single dosage form and prevent drug-drug interactions¹²

Formulation

5- fluorouracil (5FU)

- First line anti-cancer drug since 2015
- Disrupts DNA synthesis of cancer cells
- More often used as a backbone of combination chemotherapy regimens in the management of various cancers¹⁰
- **SIDE EFFECTS:** nausea, vomiting, epithelial ulceration along GI tract, mucositis, diarrhea and 'chemo fog' brain



Beta- Glucans

- β -glucans belong to a group of polysaccharides located in the cell wall of bacteria, fungi including mushrooms, as well as cereals such as barley and oats
- They are considered biological response modifiers with immunomodulatory and health beneficial effects including anticancer properties
- The mechanism of action is suggested to be through its stimulation of the immune system¹⁵

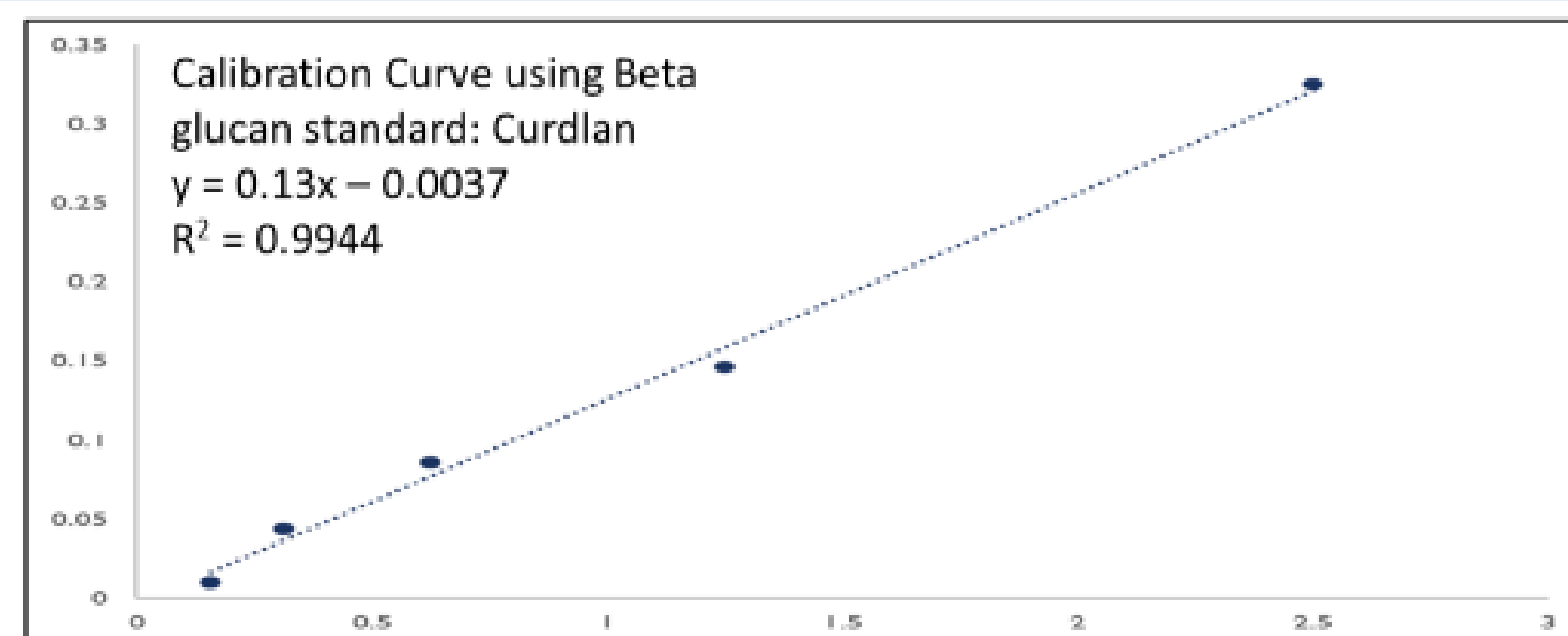
Preliminary tests on Beta glucan (Single tablets)

Physical Evaluations

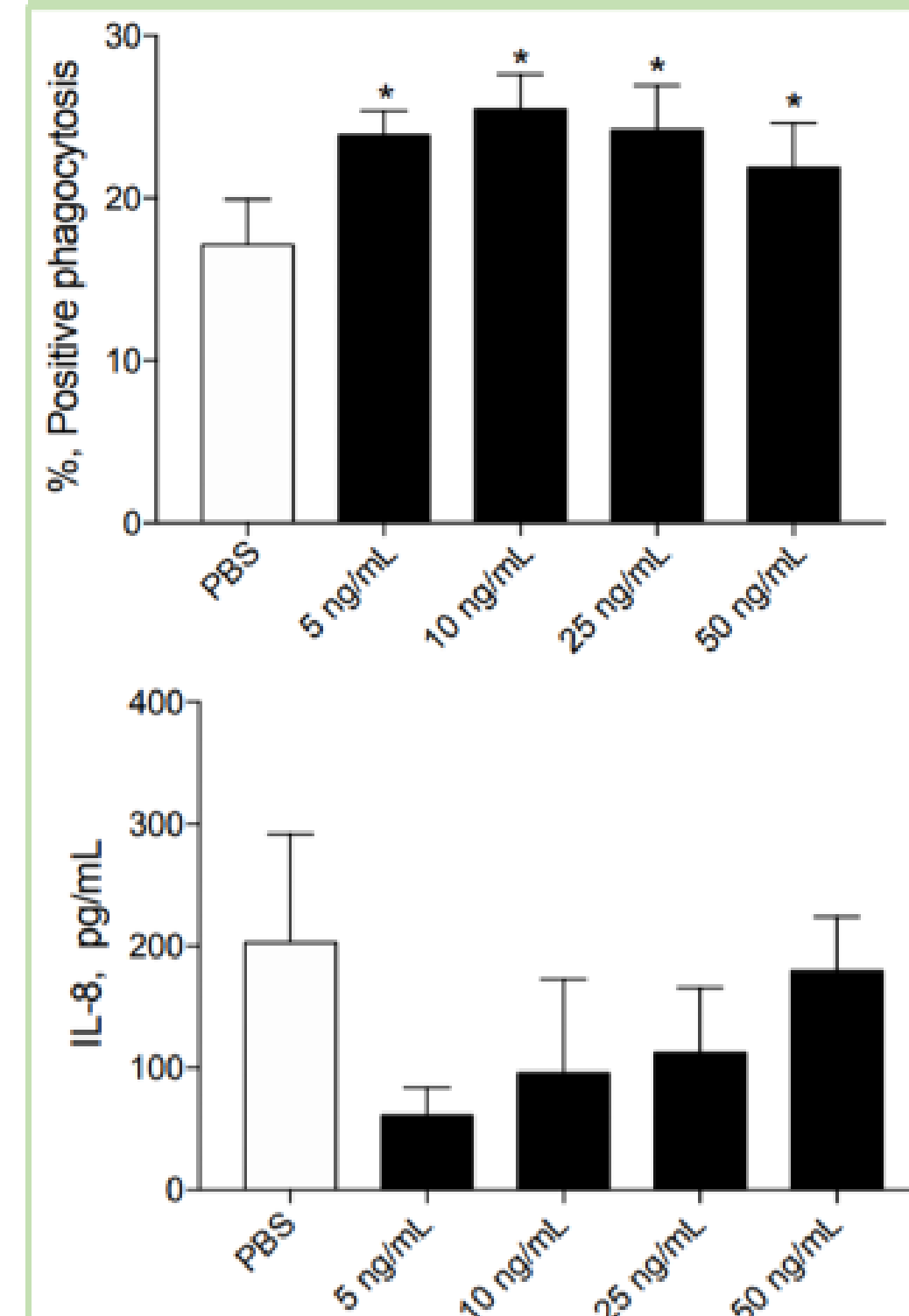
The single tablets has good uniformity
Average Weight 199.57 mg (SD 3.80)
Average Thickness 1.86 mm (SD 0.04)

Friability test 0.08%
Less than 1% limit set by USP

Quantification using optical density



Immune Potential

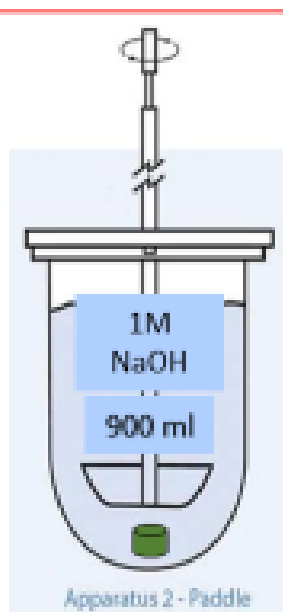


Solubility in

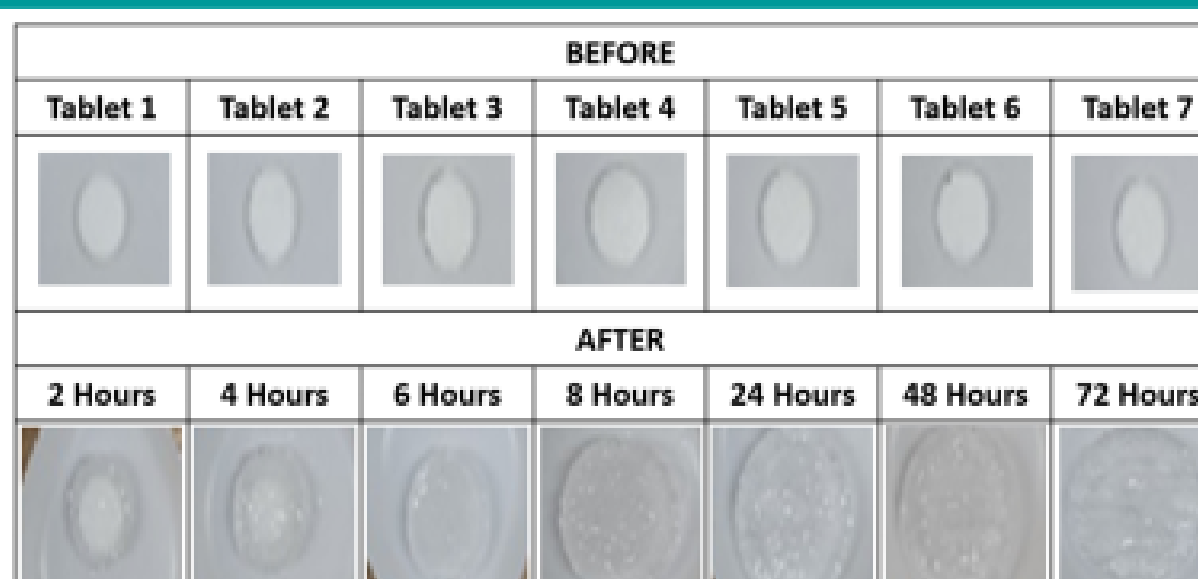
**1M
NaOH**

Dissolution Test (in vitro)

Maintained at
37°C ± 1°
100 rpm



Swelling Test for Mucoadhesive ability



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