

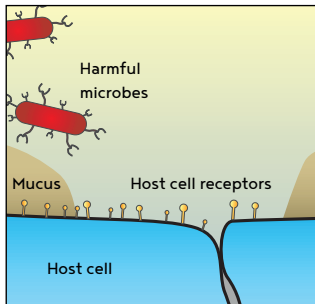


## 2QR-complex as an effective basis in Multi-Gyn products

**A healthy vaginal microbiota is essential for vaginal health.** In a healthy vagina, the microbiota are dominated by lactobacilli which provide a protective acidic environment by production of lactic acid. In disturbed microbiota, harmful microbes start to dominate and cause infection (Fig. 1).

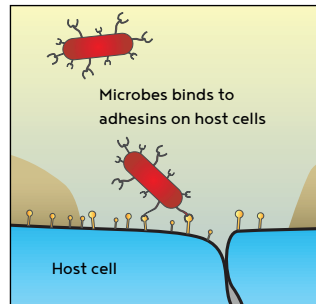
### Phase 1

Harmful microbes need to bind to host epithelial surfaces to cause an infection.



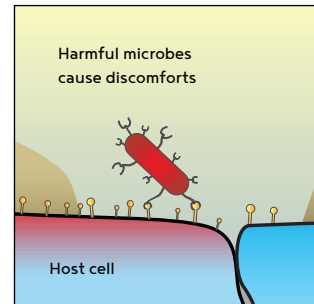
### Phase 2

Microbes use adhesin molecules to bind to receptors on host cells.



### Phase 3

Binding of microbes to epithelial cells triggers an inflammatory response in the host and causes discomforts.



### Phase 4

An infection occurs when harmful microbes multiply at host surfaces or invade tissues. In these situations, discomforts may worsen.

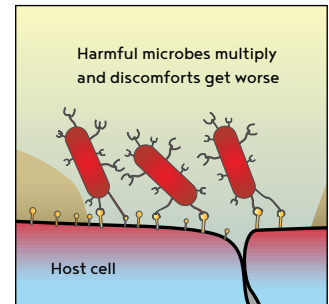


Fig. 1. Binding of harmful microorganisms is the essential first step in the process of infection.

## 2QR-complex anti-adhesive polysaccharides block harmful microbes

2QR-complex is an **innovative natural anti-adhesive polysaccharide ingredient in Multi-Gyn products** to treat microbial problems and to restore the healthy vaginal microbiota.

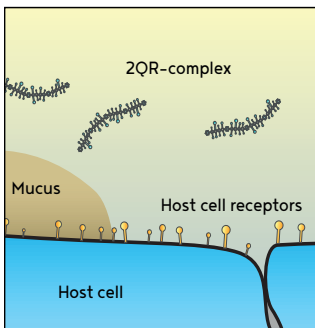
The patented 2QR-complex is made of diverse polysaccharides derived from the inner leaves of the Aloe Barbadensis Miller plant.



2QR-complex is able to neutralize harmful microbes by blocking their ability to attach to the vaginal mucosa and tissue (Fig. 2), preventing and treating a broad spectrum of vaginal discomforts. Because of the selective action of 2QR-complex, good microbes can flourish and the natural healthy balance is restored.

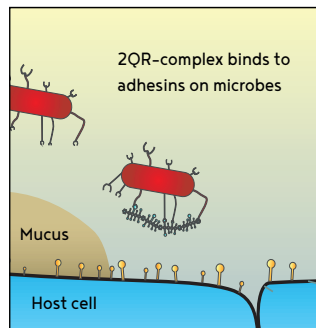
### Phase 1

2QR-complex consists of long-chained negatively-charged polysaccharides. It is a unique, natural and safe component.



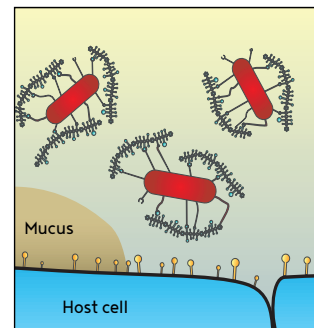
### Phase 2

2QR-complex binds to adhesins on the surface of microbes. This prevents harmful microbes from binding to receptors on host cells.



### Phase 3

When harmful microbes cannot adhere to host cells, the initial step in the process of infection is blocked. The microbe cannot do any harm.



### Phase 4

Trapped bacteria are neutralized and will be removed from the epithelial surface by natural mucosal clearance mechanisms.

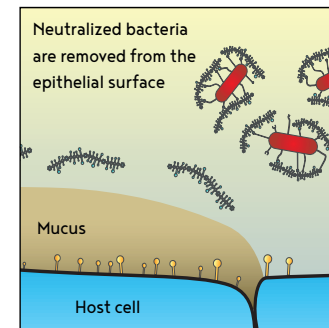


Fig. 2. 2QR-complex blocks the binding of harmful microorganisms to tissues.

## Anti-adhesive strategies as an alternative to antibiotics

A disturbed vaginal microbiota often does not require use of antibiotics as these conditions are often self-limiting. The strong discomforts such as foul odor, abnormal discharge, irritation and itching however require alternative treatment. Anti-adhesive strategies are a novel and promising alternative to antibiotics to treat the cause and symptoms of a disturbed microbiota<sup>1,2</sup>. Anti-adhesive strategies blocks binding of microorganisms to tissue without affecting their viability and thus do not destroy the healthy microbiota and have minimal risk for development of microbial resistance<sup>1</sup>.

## Scientific and clinical evidence for 2QR-complex based products

- Gastric (stomach) ulcers are caused by *Helicobacter pylori*, a bacterium that binds to gastric epithelial cells (Fig. 3, panel A).
- Addition of 2QR-complex polysaccharides strongly reduced attachment of *H. pylori* to epithelial cells by an anti-adhesion mechanism (Fig. 3, panel B)<sup>3</sup>.
- Other in vitro anti-adhesion tests showed that 2QR-complex is effective in blocking a wide range of pathogenic microorganisms, including *Staphylococcus aureus*, and *Candida albicans*<sup>4</sup>.

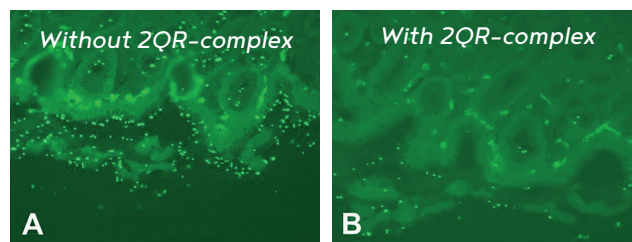


Fig. 3. 2QR-complex reduces colonization of harmful bacteria.

## 2QR-based Multi-Gyn ActiGel: effective treatment for Bacterial Vaginosis

The clinical efficacy of Multi-Gyn ActiGel was illustrated in a study for treatment of Bacterial Vaginosis (BV). Vaginal smears were taken prior to, and after 3 days of intravaginal treatment with Multi-Gyn ActiGel.

- Prior to treatment with Multi-Gyn ActiGel, vaginal smears clearly showed very strong adhesion of BV-related bacteria to vaginal epithelial cells (so-called clue cells).
- After 3 days of treatment with Multi-Gyn ActiGel, clue cells were completely absent in vaginal smears of these patients, indicating effective cure of BV (Fig. 4).

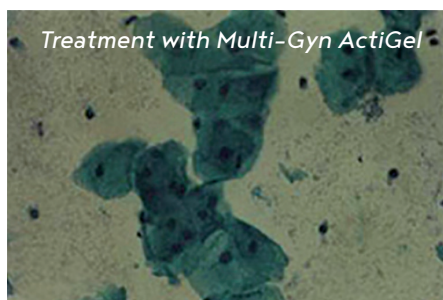


Fig. 4. Microscopic view of Gram-stained vaginal smears of a patient with BV.



## Advantages of 2QR-complex

- Innovative mode of action blocks the colonization by harmful microbes
- Effective in blocking a wide range of harmful microbes
- Does not destroy the beneficial microbes
- Does not provoke resistance (unlike antibiotics and antimycotics)
- Highly purified natural ingredient
- No known side effects

### 2QR-complex is the main active ingredient in the Multi-Gyn range



**TRIMB**  
Healthcare

1. Krachler, A. M. & Orth, K. Targeting the bacteria-host interface: strategies in anti-adhesion therapy. *Virulence* 4, 284–94 (2013).
2. Cozens, D. & Read, R. C. Anti-adhesion methods as novel therapeutics for bacterial infections. *Expert Rev. Anti. Infect. Ther.* 10, 1457–68 (2012).
3. Van Dijk, W. Further characterization of negatively charged polysaccharides isolated from concentrated Aloe vera gel with regard to antibacterial properties and molecular structure. Document on file. (2006).
4. Colic, M. Rapid Assay for the Screening of Anti-Adhesive Properties of 2QR Complex. Document on file. (2015).