

## Gut Biofilm

(information provided based on research of Dr. Anju Usman)

Children who may benefit from the biofilm protocol

1. Those with persistent dysbiosis
2. Those with other evidence of gut pain
3. Those with resistant Strep infections
4. Those with resistant Lyme

This can be repeated twice daily

## Gut Biofilm Chelators

- **Step 1- Lysis and Detachment of the Biofilm**

Use enzymes and/or chelators on an empty stomach to “punch holes” in the biofilm

- **Step 2- Target the Microbe**

30-60 minutes later take antimicrobials (Lyme, yeast, bacterial treatments)

- **Step 3- Clean Up the Mess**

1-2 hours later (or at night) take toxin binders

- **Step 4- Rebuild**

Probiotics, fermented foods, vitamins

- **Enzymes:** The specific enzymes to break down the biofilm are **still a work in progress**. The key component so far seems to be xylanase, but we are still figuring it out.

Some products being used:

- **SPS 30** by Theramedix ([www.theramedix.net](http://www.theramedix.net))
- **Mucostop** by Enzymedica ([www.enzymedica.com](http://www.enzymedica.com))
- **Apple cider vinegar**
- **Others** we are trying with Lyme treatments are  
Lumbrokinase, Rechts regulat, serrapeptase...

- There is some controversy on this and you should not add any chelators without close supervision and awareness by your practitioner (advantage is that oral EDTA is poorly absorbed, so most of it stays in the digestive tract where we want it)
- Current protocols use oral sodium or magnesium EDTA in powder or capsule form ([www.wonderlabs.com](http://www.wonderlabs.com) is inexpensive)

Studies on Vancomycin-resistant staph infections showed effectiveness when combined with oral EDTA

- Another option is BioPure Phospholipid Exchange at  $\frac{1}{2}$ -1 teaspoon per dose
- Other oral chelators could be helpful as well

Toxin Binders

- Fiber (caution with psyllium)

- Chitosan (caution with shellfish allergy)
  - Clays
  - Zeolites
  - Chlorella
  - Modifilan
  - Apple pectin
  - Butyrate
  - Activated Charcoal (especially if killing yeast)
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- Resistant strains of bacteria and yeast produce a polysaccharide matrix (aka biofilm) to protect them from the surrounding environment
  - This may explain why several kids are having normal looking stool cultures, but have great responses to anti-fungals and regress when discontinuing them
  - It is essentially a layer that encompasses the organisms we are trying to treat, making it very difficult to treat the infections without needing doses so high that would harm our children
  - The biofilm essentially hides these infections from our immune system

- The biofilm has a negative charge and is held together by molecules with a positive charge (like calcium, magnesium and iron)
- This layer also contains several different heavy metals
- This biofilm also prevents the normal flora (like acidophilus) from thriving
- The biofilm progresses when sIgA levels are low