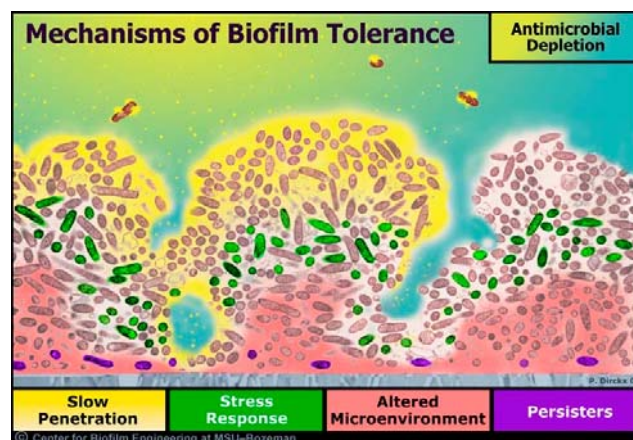


Doctors keep telling us that their clinical outcome on patients is improving by targeting core issues underlying hormone and gastrointestinal disorders. Our preliminary research studies show that laboratory tests for TSH and thyroid hormone and blood lipids improve when patients are nourished with hormone precursor nutrients derived from whole food fermentation. As one would expect, those with stubborn abdominal fat are losing weight when everything they tried before didn't work. Our research has found toxic mold in many popular nutraceutical or superfood products. In fact, we can no longer find pure, non-moldy or non-toxic superfoods (spirulina, green barley, royal jelly and blue-green algae). This newsletter presents clinical pearls to help you understand how to conquer stubborn biofilms and deep, layered toxicity. – AAQM President – Dr. Paul Yanick

Clinical Pearls on how to Conquer Stubborn Biofilms

More and more evidence accumulates on how infectious microbes can communicate and form structures called biofilms. Biofilms are stubborn infections involved in otitis or cavitations, chronic gastro-duodenitis, pelvic floor disorders, stubborn and persistent UTI's and other disorders. Biofilms follow antibiotic or the anti-infective treatments used in alternative medicine. These persistent, chronic infections are treatment-resistant and underlie maldigestion while sabotaging detoxification efforts and depleting the body of nourishment. Think about it: If you were a pathogen under attack from the immune system, you'd want to duck into a host cell to get nourished and replicate under cover, invisible to passing patrols.



Breakthrough Research on Biofilms at Montana State University

Credit is given to the *Center for Biofilm Engineering at Montana State University* for the graphics used in this newsletter. The emergence of a new field in basic microbiology has grown around trying to find ways to understand biofilms (*Nature* 2003. **424**:134; *J Bacteriol* 1994. **176**:269-75; *Annu Rev Genet* 2001. **35**:439-68; *FEMS Microbiol Rev* 2001 **25**:365-404; *Annu Rev Microbiol* 1995 **49**:711-45; *Science* 1999 **284**:1318-22). As we discovered, there are certain probiotic ferments that represent an Achilles' heel, a fragile target for knocking out stubborn biofilms. Since the publication of my 2004 Quantum Medicine Update column that alerted the profession to the silent and hidden dangers of biofilms, my colleagues and I have studied how specific lactic acid ferments could eradicate biofilms. In developing QuantaBiotica™**, we had to overcome many hurdles as biofilms seemed to underlie many diseases (*J Clin Invest.* **112**(9): 1288-90, 2003).

Drug-resistant micro-organisms can ONLY be conquered by using the innate powers of the immune system as a therapeutic agent. And, the innate cytokine response is under control of the vagus nerve. When the vagus nerve function is diminished, inflammation soars and this provides the ideal conditions for biofilms to take root in the GI tract. The innate immune system works in concert with the vagus nerve and commensal-probiotic cells to keep inflammation under control. Sadly, most doctors are using antibiotic or other anti-infectives (colloidal silver, oregano oil, allicin from garlic, etc) and this knocks down the human commensal cell population dramatically.

It took me decades to appreciate the fact that the innate immune system can only become fully operational when commensal cells are plentiful and able to attack overlooked, hidden, or treatment-resistant biofilms. But, even these super-healing cells cannot conquer microbes when there is out-of-control inflammation. Sadly, most practitioners are only addressing 10-15% of inflammation at the COX-2 and LOX pathways and no one is talking about the 80-85% of inflammation that result from a nutrient-depleted vagus nerve. Indeed, the complexity of the immune system with its abundance of compounds and molecular strategies can forge medical innovation and help practitioners to develop

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therapies to combat maladies ranging from pneumonia that repeatedly afflicts people with cystic fibrosis to deep and silent infections that promote pain and inflammation in arthritic disorders.

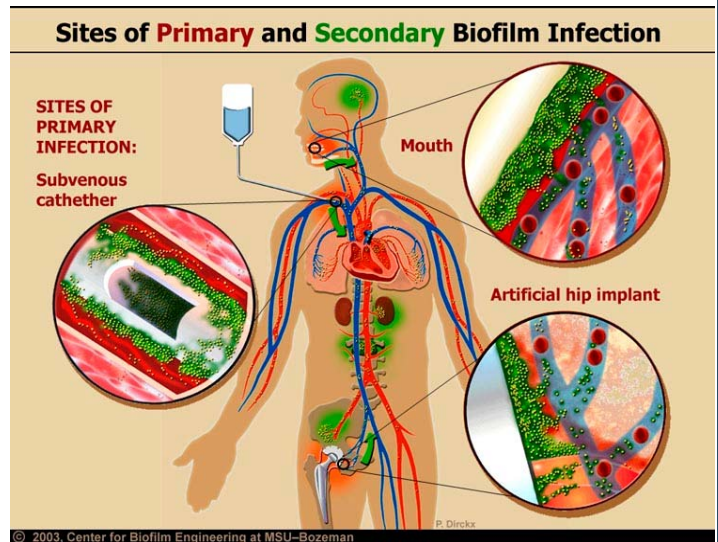
The Power & Amazing Flexibility of the Innate Immune System

The power and flexibility of the immune system against infection is remarkable. But, if we use anti-infectives or anti-fungal herbs, we leave the immune system expending all of its energy in endless microbial warfare...a battle that cannot be won without the appropriate teamwork of commensals. The tremendous diversity and mutability of many infections and their ability to intelligently exploit the cells and interactions of the immune system to propagate themselves, is the main focus of the newsletter. Why? Because infections of this nature are the most prevalent infections facing humans and are of serious concern in immuno-deficient patients as they relentlessly produce endotoxins that activate prolonged inflammation and tissue damage in the organism.

Since early 2000, I taught practitioners how biofilms caused maldigestion and taught them that using digestive enzymes only erodes the gut mucosa causing IBS or leaky gut syndrome and allows biofilms to get stronger. My pioneering work with duodenitis and gastritis was published in the early 1980's. Remember, a biofilm settles down into anaerobic tissue site as a mucous-like and sticky matrix where it aggregates, communicates, and constructs slimy edifices that block or inhibit excretion and secretion channels in the duodenum. **This means that the body can no longer digest foods or detoxify (cleanse) itself.**

Because biofilms resonate harmoniously, they cannot be muscle tested or tested with any equipment or mode of testing. Consisting of a dense symbiotic aggregation of microbes embedded in a highly hydrated polymer, polysaccharide matrix of its own secretion, biofilms are found in the cornea, tonsils, wounds, nasopharynx, middle ear, prostate and urinary tract, teeth (under root canals, fillings, implants, or as chronic bacterial otitis in extraction sites), dental plaque, oral soft tissues, gall bladder, GI epithelium, heart (endocarditis) and lungs, making them notoriously difficult to treat. Their anti-microbial resistance coupled with the inaccuracy of current lab tests to diagnose hidden biofilms and intracellular infections makes biofilms the greatest clinical challenge facing doctors today (*Mol Immunol* 2002;38:947-57; *Annu Rev Microbiol* 2000;54:49-79; *J Clin Microbiol* 2001;39:3234-40; *J Med Microbiol* 2002;51:344-9; *Nature* 408, :284, 2000; *Science* 284 1999:1318-22; *J Clin Invest* 112:1466-77, 2003; *Annu Rev Microbiol* 2002; 56:187-209; *Appl Environ Microbiol* 67:5608-13).

Bacterial biofilms are ubiquitous—dental plaque (which confront us daily) and the slime that grows inside a flower vase after two or three days are common examples. The biofilm concept of chronic infections explains a phenomenon that has troubled clinicians for some time: blood cultures from patients who show many signs of overt bacterial infection are often negative. According to Dr. J.W. Costerton, of the Center for Biofilm Engineering at Montana State University "biofilms are in all of the chronic infections examined in the 12 years during which this morphological series was pursued." He further states "When the model used to analyze a natural process is incorrect, our attempts to understand and manipulate the process will fail, many honest and conscientious people will be frustrated, and the reputations of whole research groups will be damaged. In the case of chronic bacterial diseases, diagnostic microbiology labs reported that cultures of *Pseudomonas aeruginosa* from Cystic Fibrosis (CF) patients were sensitive to antibiotics (e.g., cloxacillin), but pulmonary clinicians saw little improvement when these antibiotics were used. The sera of CF patients contained very large amounts of specific antibodies against *Pseudomonas*, but the disease persisted, and the use of anti-*Pseudomonas* vaccines resulted in the deaths of some patients. Middle ear specimens from children with chronic otitis media with effusion (COME) yielded negative bacterial cultures, so that a host-sustained inflammatory etiology was suspected, but the factors driving the inflammation could not be identified and serology did not confirm the persistent involvement of viruses. Patients with raging febrile prostate infections yielded expressed prostatic secretion (EPS) samples that produced cultures negative for bacteria, and material recovered from osteomyelitis debridations with



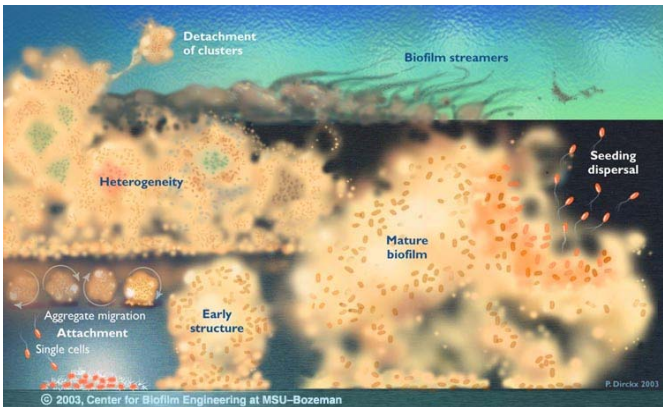
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frank pus yielded only a few colonies of skin and environmental organisms. All was shadows and fog, and the reputations of the microbiology units of many hospitals plummeted from the high levels they had attained earlier."

Biofilms have material properties similar to those of a viscous fluid and micro-colonies of mixed bacteria and fungi are deformable as they oscillate in high-shear systems, breaking off and detaching as biofilm fragments that spread into different areas of the body. Biofilm-related infections are involved in the deterioration of gums and jawbone that eventually leads to loss of teeth (periodontal disease); ear infections in the outer ear canal, middle and inner ear, stubborn sinus infections, and chronic gall bladder, stomach and cardiac infections. In addition, root canal teeth and dental implants often become colonized creating a slow developing but persistent infection that often lingers for years. In most cases, we have found that the infection is extremely difficult to diagnose and eradicate.

The healthy immune system in concert with the teamwork of commensal cells (90-95% of the cells in the body) can unleash its magnificent and diverse arsenal of antimicrobial agents to conquer biofilms. Clinically, this process has to be done in layers with appropriate dosing of QuantaBiotica™. If you don't nourish and stabilize the lipid bilayer of neurons, expect it to take 3-6 months to get rid of biofilms. Prolonged and destructive inflammation must be halted or the human immune system will not be able to eradicate biofilms. Clearly, while other practitioners are hitting the body with anti-candida and anti-infective agents to no avail, you will intelligently engage the innate immune system and commensal cells to slowly break down biofilms. Anti-infective approaches fail as these antimicrobial agents cannot fully penetrate the biofilm leaving bacteria to exist in a protected state as they mutate and adopt a distinct and intrinsically resistant phenotype. **The more we treat infection, the faster they mutate and the stronger they become.**

While the immune system can mop up free-floating bacteria in the blood, it has difficulty reaching and penetrating biofilm bacteria. In most cases, doctors resort to the overuse of antibiotics, but bacteria in biofilms clearly react differently than lone bacterial cells do to these assaults and all this treatment accomplishes is to allow the biofilm bacteria to flourish and gain resistance as the antibiotic eliminates susceptible cells and bacteria.



In summary, sophisticated tools of microbiology reveal that chronic diseases involve pathogenic mechanisms demonstrating unequivocally that bacterial biofilms are both present and metabolically active, even when bacteria cultures are negative. Biofilms force victims to submit to the abuse and overuse of antibiotics and anti-fungal drugs or botanicals for the remainder of their lives. The fact that chronic infections commonly grow in biofilms goes some distance toward explaining the perceived anomalies of many diseases, and offers a measure of hope that they can eventually be controlled.

Successful clinical treatment and reduction of tenacious biofilm stressors requires the use of commensal-probiotics in the proper balance and careful clinical attention to the *Vagus Efferent Cholinergic Anti-inflammatory Pathway* which I will write more about in future newsletters. A hallmark of all biofilm diseases is the chronic nature of the infections as infections linger for months, years, or even a lifetime as it compromises the quality of life and exhausts the immune system. With new exciting insights about biofilms, it becomes plausible that solutions to prolonged inflammation (commonly due to bacterial endotoxins) will be found. Then we can get off the hopeless omega bandwagon and treat the actual cause of prolonged inflammation. Since swollen and inflamed tissue allows biofilms to proliferate do serious damage to the organism while burning out the human immune system, it makes sense to find ways to fully engage innate immunological defenses. In retrospect, it is astonishing that medicine has overlooked biofilms and has not used the elegant weapons of commensal cells to disrupt the microcolonies of bacteria that underlie biofilms.



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