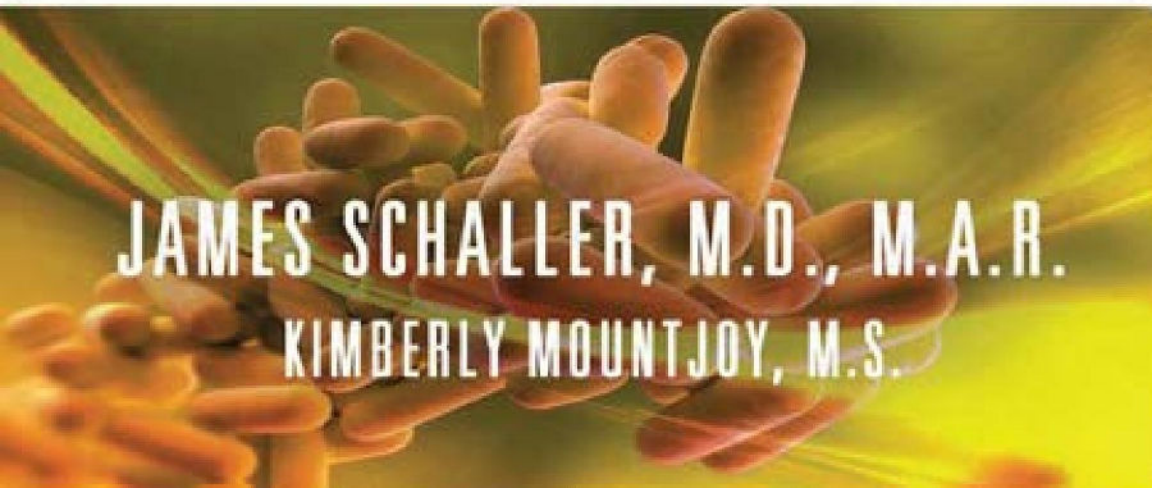
COMBATE A BIOFILMES

POR QUE SEUS ANTIBIÓTICOS E ANTIFÚNGICOS FALAM

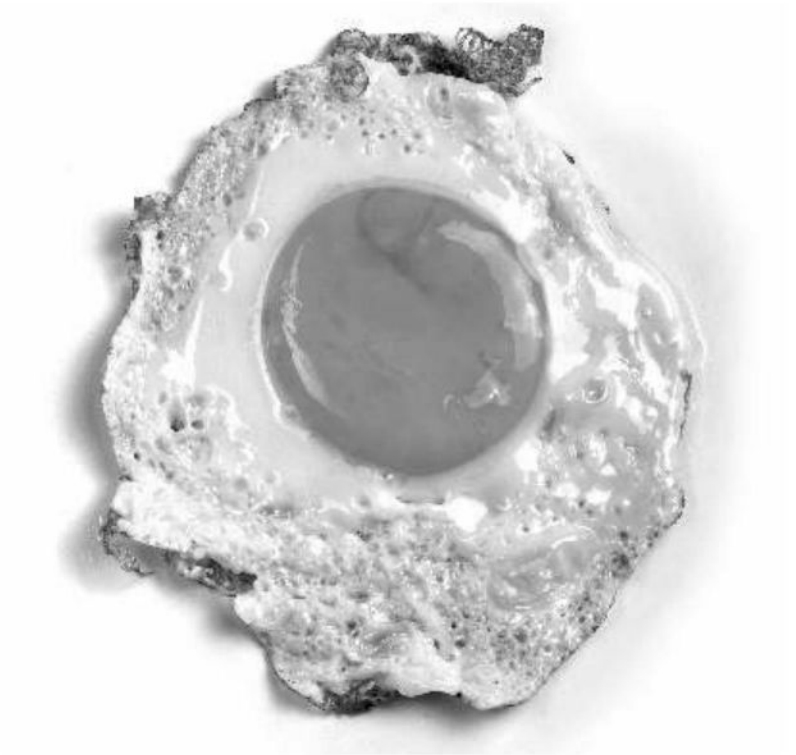
Soluções para doença de Lyme, sinusite crônica,
Pneumonia, infecções fúngicas, feridas, ouvido
Infecções, doenças gengivais, doenças intestinais,
Mau hálito, fibrose cística e implantes

UMA GRANDE PEÇA QUE FALTA NO QUEBRA-CABEÇA DA DOENÇA CRÔNICA



O que é um biofilme?

A definição simples e científica de biofilme: qualquer grupo de microrganismos em que as células se aderem umas às outras numa superfície. Eles normalmente estão dentro de uma camada que eles criam chamada "lodo".



Compare um biofilme a um ovo frito. A gema amarela no centro do ovo frito é uma infecção bacteriana ou fúngica.

A maior parte branca que envolve a gema pode ser chamada de "biofilme". Ele protege a infecção interna, ou gema, tanto dos antibióticos quanto do sistema imunológico humano.

A borda externa do ovo apresenta algumas bordas fritas muito pequenas. Eles são fáceis de perder devido ao tamanho do ovo. Vamos fingir que são antibióticos ou produtos químicos que matam infecções. Eles são inúteis porque nunca ultrapassam a borda branca externa do ovo. A clara do ovo é como uma parede para eles.

Quem tem infecções por biofilme?

Quando você aprende sobre a enorme diversidade de locais e situações em que os biofilmes são comuns e considera que esse é frequentemente o estado rotineiro de bactérias e organismos fúngicos, você começa a perceber que qualquer pessoa pode ter uma infecção ou infecções por biofilme.

O que procuramos neste livro?

O material a seguir mostrará muitas maneiras de romper a "clara de ovo" ou biofilme. Quando isso acontece, geralmente é muito mais fácil destruir a infecção representada pela gema do ovo ou centro amarelo.

Biofilmes são uma das principais causas de sofrimento e morte

Locais e situações do corpo do biofilme

- **Uma infecção que dura mais de 2 semanas**
- **A principal causa de morte em crianças menores de 6 anos de idade**
- **Placa dentária – a boca humana alberga cerca de 25.000 espécies de bactérias, das quais cerca de 1.000 residem no biofilme da placa dentária.**
- **Infecções fúngicas**
- **Infecções pós-cirúrgicas**
- **Câncer**
- **Mal hálito**
- **Doença gengival ou periodontite***
- **Cárie dentária •**

Infecções pulmonares

- **Infecções do sistema urinário**
- **Bactérias orais – podem danificar as artérias do coração e causar a morte e aumentar o número de cancros intestinais**
- **Infecções de ouvido crônicas**
- **Infecções sinusais****
- **Amigdalite crônica**
- **Ferimentos**
- **Cabeças de escova de dentes — incluindo estilos de cabeça móvel sônica**

- **Cateteres para permitir a remoção de urina**
- **Joelhos, quadris artificiais e outras substituições**
- **Infecções nas válvulas cardíacas**
- **Lesões ou feridas**
- **Doença de Lyme**
- **Cateteres intravenosos de qualquer tipo**
- **Cateteres urinários**
- **Lentes de contato**
- **Dispositivos implantados – qualquer dispositivo implantado ou inserido pode enviar bactérias para o cérebro, fígado ou rins.**
- **Infecções crônicas da próstata**
- **Doença do legionário e muitas outras bactérias biotóxicas que explodem em qualquer água interna**
- **Doenças de mofo – que podem surgir do acúmulo de mofo em qualquer água parada em ambientes fechados, ou seja, inundações, vazamentos no telhado, no porão ou nas janelas, umidificadores, Waterpik™ não utilizado ou outros dispositivos de limpeza de dentes,**

condensação em dutos de CA, etc. fibrose – a produção excessiva de muco nas vias aéreas permite que bactérias como Pseudomonas aeruginosa derrotem os assassinos de bactérias por trás de uma camada de biofilme.

- **Partes do corpo perdidas**
- **Infecções de pele, cabelo ou unhas**
- **Artrite**
- **Endocardite**
- **Infecções ósseas**
- **Acne**

Muitas outras coisas poderiam ser acrescentadas à lista, incluindo questões profundamente graves de contaminação por biofilme na água e dezenas de outras práticas de produção e relacionadas com a saúde.

***O médico David Kennedy, um dentista aposentado, lamentou que a maioria dos adultos americanos tenha doenças gengivais – outra condição de biofilme bacteriano que envolve infecção crônica. Então, quão difundida é esta epidemia furtiva de cuidados de saúde?**

****Na Ondine Biopharma, uma entrevista [com Richard Longland] revelou que 38 milhões de pessoas neste país têm (ou tiveram) um problema crônico de sinusite.**

*****Ricardo Murga; Terri S. Forster. Papel dos biofilmes na sobrevivência de Legionella pneumophila em um modelo de sistema de água potável. Microbiologia (2001), 147, 3121–3126.**

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Por que seus antibióticos e antifúngicos falham

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Uma grande peça que falta no quebra-cabeça das doenças crônicas

James Schaller, MD, MAR
e
Kimberly Mountjoy, MS

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Fazendo respostas atuais para salvar vidas em biofilmes
Claro e sólido como uma rocha

Neste momento você pode ler dois anos de opções de destruição de biofilme em jornais, blogs e livros. Isso levaria de 1.000 a 1.500 horas. E você teria uma série de opções a propor. Aqui estão alguns exemplos de opções que você encontraria nesses jornais, blogs e livros:

Evite magnésio	EDTA	**Geléia real**
Evite açúcares e grãos	**DMSO**	**Tomilho**
NAC	**Vancomicina**	**Capim-limão**
Norspermidina	**Gentamicina**	**Serrapeptidase**
Cis 2- Ácido Decenóico	**Banderol**	**2-Aminobenzimidazol**
Lumbroquinase	**Evite gorduras**	**Equinocandinas**

Como você encontra marketing razoável e confiança em um agente de biofilme como solução?

Tom e Lisa blogam que o produto "x" e a prescrição "d" são tratamentos excepcionais para minar infecções de biofilme na fadiga crônica (SFC) e na fibromialgia (FM).

As pessoas estão entusiasmadas porque o seu médico regular não tem nenhuma solução importante e não tem interesse em infecções por biofilme.

O problema é que "x" ou "d" podem ser úteis para minar um biofilme ou ajudar a superar uma doença. Mas tome cuidado para fazer links rápidos. O tratamento "a" só pode funcionar no biofilme de dez infecções, e só temos provas de que funciona em três infecções.

Nosso objetivo é mostrar o que boas pesquisas mostram para que você e seu médico possam começar com os fatos e sejam capazes de entender a razão por trás de qualquer possível teste de biofilme.

Por exemplo, sua infecção pode ser como Lyme no uso de ferro. Saito e muitos outros relatam que, ao contrário de todos os outros organismos conhecidos, a Borrelia, a causa da doença de Lyme, pode existir sem o ferro, um metal de que todas as outras formas de vida necessitam. Em vez disso, Borrelia usa manganês.

E se no futuro se descobrir que a sua doença baseada no biofilme terá a mesma capacidade de viver bem sem ferro? Isso pode significar que um agente de biofilme que prejudica o biofilme da doença de Lyme pode funcionar para o seu. Biofilmes de infecções bacterianas e fúngicas tendem a compartilhar uma vulnerabilidade semelhante a um desregulador de biofilme. Saber como funciona a sua infecção pode ajudar a determinar qual agente de biofilme funcionará.

http://phys.org/news/2013-03-scientists-reveal-quirky-feature-lyme.html#jCp. Acessado em 26 de março de 2014.

Conteúdo

Uma revolução médica

A teoria da infecção por biofilme é uma revolução profunda no estudo de infecções que podem ser dolorosas, incapacitantes e, na verdade, são as principais causas de morte, dependendo da idade.

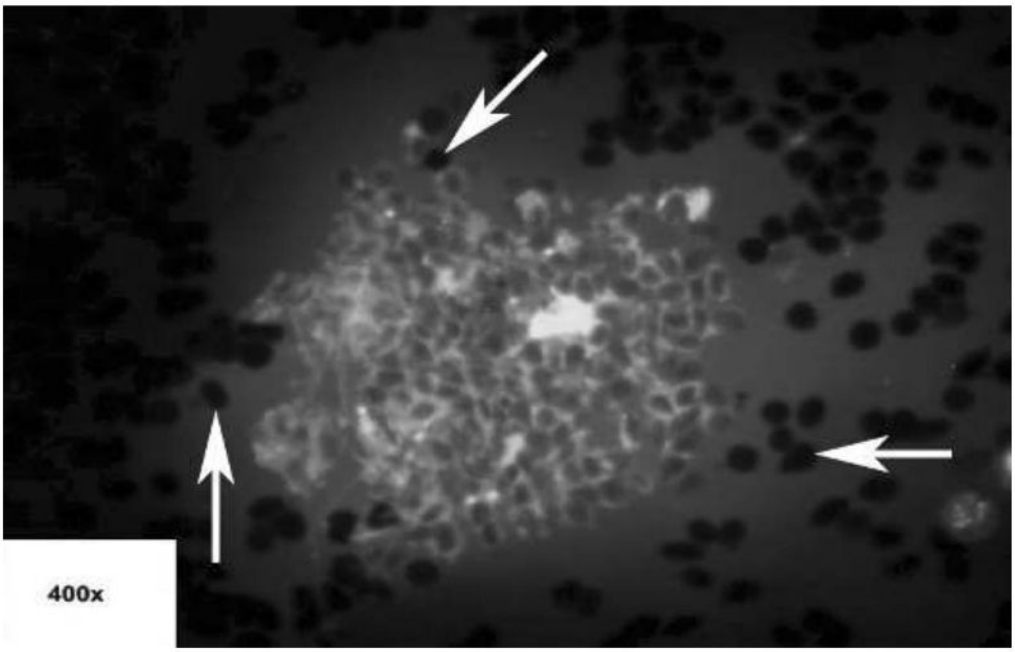
As infecções estão começando a nos levar de volta aos dias em que as pessoas morriam de infecções simples. O novo mundo da infecção por biofilme poderá matar mais pessoas do que a Primeira e a Segunda Guerra Mundial juntas, se as coisas não mudarem rapidamente tanto nos países desenvolvidos como nos subdesenvolvidos. Devido a uma lenta compreensão da importância dos biofilmes e, portanto, à lenta adoção por parte dos médicos de novas soluções de biofilme, mesmo os médicos mais avançados só poderão levar os biofilmes a sério quando for comprovado que mais pessoas estão ficando incapacitadas e morrendo devido a eles . Atualmente, a maioria considera os biofilmes como causa de sofrimento e morte. Assim, os biofilmes sem soluções são tão graves como a poliomielite no século XIX sem vacina e, em termos de número de víti

A maioria das bactérias vive em comunidades que normalmente possuem biofilmes protetores únicos. 1% das bactérias que infectam humanos ou impactam a vida humana estão flutuando sozinhas e quando são encontradas no sangue, não seriam encontradas junto com qualquer lodo de biofilme.

Os Institutos Nacionais de Saúde estimam que mais de 80% das infecções microbianas no corpo humano são causadas por biofilme, muitas delas criando problemas crónicos e recorrentes. Ou Glowacki está certo e 99% das bactérias vivem em um biofilme? Quer você use os 80% do NIH ou os 99% do Glowacki como estimativa, os biofilmes são uma consideração séria nas infecções.

Gÿowacki R, Strek P, Zagórska-Swiezy K, Skÿadzieÿ J, Oleÿ K, Hydzik-Sobociÿska K, Miodoÿski A. [Biofilme de pacientes com rinossinusite crônica. Estudos morfológicos SEM].[Artigo em polonês]. Otolaringol Pol. 2008;62(3):305-10.

Imagens introdutórias de biofilme



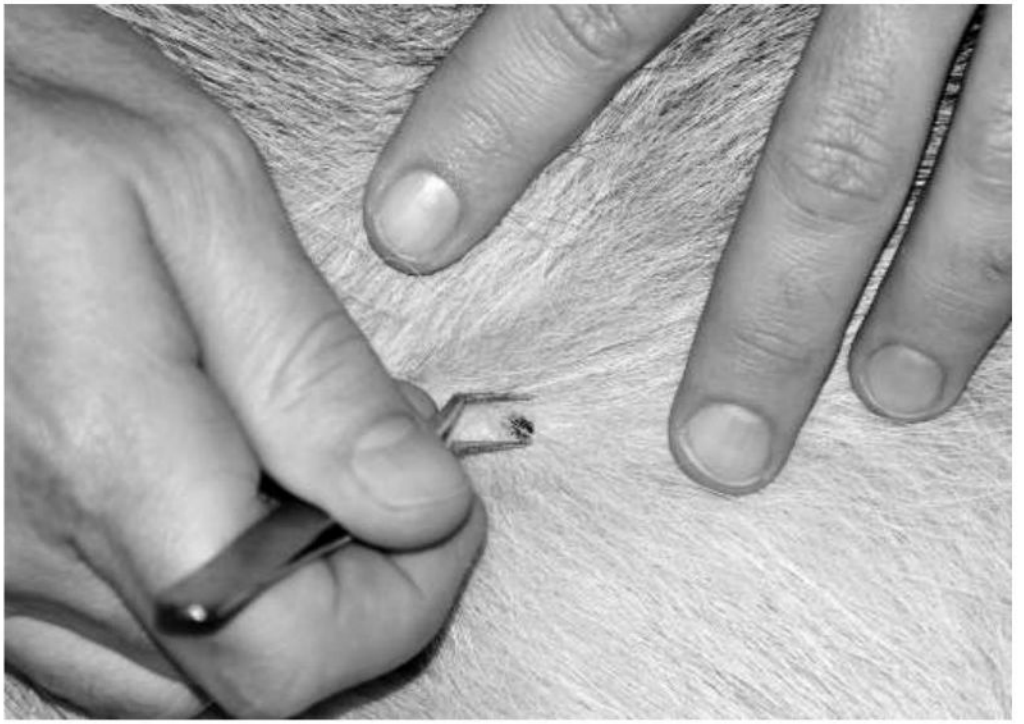
Um novo parasita unicelular produtor de biofilme geneticamente único chamado FL1953 ou Protomyxzoa rheumatica. (Este esfregaço especial é a melhor forma de detectar estes parasitas unicelulares em corpos humanos, uma vez que os testes de ADN ou PCR nem sempre são positivos).

As cem formas ovais escuras na parte externa desta imagem mostrada acima são glóbulos vermelhos (RBCs) de 8 mícrons. A massa central é uma bola de biofilme com muitos glóbulos vermelhos na massa do biofilme.

Este biofilme mostrado acima é comumente encontrado em pessoas com infecções transmitidas por carrapatos, como a muito comum Bartonella, a bactéria Bor-relia da doença de Lyme e a mortal Babesia. Embora algumas doenças transmitidas por carrapatos possam ser piores que outras ou mais comuns que outras, todas são potencialmente mortais, a menos que sejam erradicadas. Este parasita mostrado acima é uma infecção unicelular relacionada à Babesia e à malária, e quando é despojado do seu biofilme, parece uma malária imatura. De acordo com os Centros de Controle de Doenças, este é um protozoário único. Não é Babesia nem malária. Esta infecção é chamada FL1953 ou Protomyxzoa rheumat-ica. Produz enormes quantidades de biofilme e a enorme massa central nesta imagem contém centenas de gló

Como estamos a analisar diferentes órgãos e causas de biofilmes, não devemos deixar de fora um vector de infecções de biofilmes transportado por mais de 200 seres vivos em pelo menos três continentes – a carraça Ixodes. Ele carrega pelo menos dois importantes produtores de biofilme: FL1953 e a altamente complexa bactéria Lyme geneticamente avançada. Ainda estamos aprendendo sobre todas as possíveis infecções que ele carrega.

Observe que o cabelo parece grama grande, então esse carrapato tem uma fração desse tamanho. Quando você combina a invisibilidade com uma mordida que contém um analgésico, um anti-histamínico, um anticoagulante e um agente antiinflamatório, você tem um portador de infecção furtivo. Um produto químico da saliva do carrapato, a Sialostatina L, é uma enzima imunossupressora tão boa que pode inibir a asma (Horka 2012).



Os cães podem ser os melhores amigos do homem, mas não se você tocar na saliva deles e não se eles trouxerem carrapatos ou pulgas para sua casa ou carro. Suponha que todos os cães e gatos que vivem fora de uma cidade provavelmente já tiveram picadas de carrapatos ou pulgas.

Tornando “Biofilmes” claros

Um biofilme é como uma moeda de dez centavos no centro de uma piscina de azeite, e na borda externa do óleo há pimenta, representando células que matam infecções. Eles não podem entrar para destruir a moeda. As comunidades de bactérias do biofilme são o estado normal da maioria das infecções humanas. Fomos ensinados que as infecções são bactérias isoladas flutuando e isso é um erro grave. Isso mostra até onde precisamos ir na ciência se a principal forma de bactéria— comunidades de bactérias de biofilme – é um conceito novo, mas crucial. Quando fiz uma lista, em 2004, de 25 opções para matar biofilmes, não houve muito interesse.

> **Hoje, a incapacidade de destruir biofilmes com diversas opções é literalmente um desastre para a saúde.**

O objetivo ao escrever e publicar este livro é criar um conjunto acessível de opções baseadas em pesquisas, juntamente com outras opções possíveis, para apresentar um livro puro de soluções que ofereçam as mais novas soluções possíveis, atuais e atualizadas, para as centenas de doenças associadas. com biofilmes. A barreira de uma película biológica pode ser totalmente impossível de remover ou penetrar com as opções de rotina utilizadas por médicos, especialistas em infecções, naturopatas, escolas de medicina alternativa, praticantes de óleos essenciais, acupunturistas, enfermeiros ou fitoterapeutas.

Com este livro esperamos servir você e seu médico/curador através da exploração das opções disponíveis agora. Pesquisamos as publicações dos últimos cinco anos no PubMed – o enorme banco de dados da ciência médica – para “tratamento de biofilme”. A gama de opções é impressionante e nem sempre é o que você esperaria. Este livro pretende oferecer amplas opções para prevenir o sofrimento, a incapacidade e até a morte.

Após anos de pesquisa e estudo, percebi que os “especialistas” em doenças infecciosas em biofilme podem ter perdido a guerra há muito tempo e, na verdade, muitos podem nunca ter tido conhecimento de todas as batalhas. Pa-

Amostras muito curtas de pessoas e biofilmes

Em 2004, Richard Longland se recuperou muito mal de uma doença misteriosa após uma cirurgia na coluna. Nos meses que se seguiram, ele sofreu de muitos problemas – dores de cabeça, dores nas articulações e, mais tarde, problemas cardíacos e cerebrais, fadiga brutal e dificuldade para pensar.

O sistema médico se opôs a ele, mas finalmente, em 2007, ele foi tratado de um micoplasma proveniente de um possível processo cirúrgico, em qualquer lugar do hospital ou em local público ou de um carrapato.

A maioria dos meus pacientes consultou de 3 a 200 médicos antes de vir até mim. Eu entendo a experiência dele. O Sr. Longland teve que consultar mais de vinte médicos para um diagnóstico. Durante esse período difícil, ele criou um filme superior chamado "Por que estou tão doente?" Ele é um paciente defensor do uso de agentes farmacêuticos e naturopáticos para livrar seu corpo de biofilmes bacterianos sistêmicos.

***

Edward tem 78 anos e três filhas e oito netos. Ele foi hospitalizado por falta de ar. Ele tem uma forte pneumonia ou uma infecção no pulmão. Ele está piorando. Os indivíduos se recuperaram usando agentes que derrotam muitas pneumonias protegidas por biofilme.

***

Linda está cansada há alguns anos e tem problemas com a escola. Recentemente descobri que ela tem uma série de infecções por carrapatos que fizeram com que mais de quinze resultados laboratoriais fossem anormais. Ontem ela ligou e devido a uma dor atrás do joelho, eu disse para ela ir ao pronto-socorro. Em menos de um dia, descobriu-se que ela tinha 23 coágulos nos pulmões e nas pernas. Ela suspeita que seja Babesia, inflamação e FL1953. Tivemos agentes que mataram estes agentes, incluindo FL1953, em 2006.

***

It would be an error to say that nattokinase, lumbrokinase, serrapeptidase, EDTA, gentamicin, vancomycin, Samento, Banderol, olive products, poorly known herbs with fair lab testing in humans, clove bud oil, diet, chelation, three to four part amino acid mixes, NAC, Rife, diet changes or a vast range of other options not listed, will **work for all biofilms.** For example, an elderly patient dying of a lung infection or another person with painful and treatment-resistant sinus infection *will not* have the same biofilm.

As a trend, trying different options to destroy a biofilm is less dangerous than allowing it to spread.

A Brief Word on Biofilms in Lyme

At times, individuals who have tick- and flea-borne infections, like Bartonella, Babesia and Borrelia (Lyme disease), can feel their treatment is minimal or incomplete. Debates rage over the diagnosis and treatment of Lyme and tick-borne diseases; whether the pain is from residual dead infection incorporated into tissue or one of the many infections carried by the I. scapularis tick, we still have patients' misery.

After writing **twelve books** which include many pages on non-Borrelia infections, "Lyme testing" seems like alphabet testing in which ***one only looks for the vowel "a."*** Due to the lack of acceptance of the number and complexity of tick-borne infections, there is a lack of up to date education, leaving quality medical doctors to evaluate tick and flea infections in the ***abstract,*** by which I mean that they very falsely and sadly do not realize the full magnitude of ***"the alphabet."***

Specifically, they "diagnose" by ignoring inflammation alterations, nutrient changes, hormone deficits, immunity changes caused by tick-borne infections, and chemicals made or suppressed by direct tick and flea infectious agents. I discuss these in my three most recent tick and flea infection books. All are available in English. All can be found free through inter-library loan, for less than $20 USD, or at www.personal-consult.com under the "free books" button. No one can expect to become an expert in this massive area after reading any guide or merely going to ten conferences, because these cluster infections impact twenty areas of medical and scientific knowledge.

In the last four years, researchers like **Dr. Eva Sapi have shown Lyme is like some other spirochetes—it has biofilms. These are very tough biofilms to defeat unless caught in the "acute stage."** A tough, "mature biofilm" allows organisms to "**laugh at" many antibiotics.**

Some medical professionals interested in Lyme often ignore the immune suppressing Bartonella bacterium, which is more common than Lyme. Ignoring coinfections may increase the risk of fatality with Babesia and possibly **FL1953**. These healers also may not realize that the highly

genetically complex Lyme spirochete appears to have a troublesome biofilm. Performing a simple direct test at laboratory companies whose testing kits have reduced sensitivity will probably result in more negatives for tick-borne diseases. The ultimate result is anti-science and anti-truth. Searching for tick infections with one test is like writing in "Lincoln" at the next presidential election.

Lyme Disease (Borrelia) and Biofilms

Several researchers believe *Borrelia burgdorferi,* the active agent of Lyme disease, has biofilms. Lyme organism biofilms have been found in culture and in the tick gut. Lyme cysts and biofilms have also been noted in patient skin biopsies using focus floating microscopy according to Dr. Eisendle publishing in the *American Journal of Pathology.*

Further, we see in Lyme that biofilm formation is dependent on cyclic di-GMP expression and we see that in Lyme (Stricker and Johnson).

Brihuega B, Samartino L, Auteri C, Venzano A, Caimi K. In vivo cell aggregations of a recent swine biofilm-forming isolate of Leptospira interrogans strain from Argentina. Rev Argent Microbiol. 2012 Jul-Sep;44(3):138-43. PMID:23102459

Cogoni V, Morgan-Smith A, Fenno JC, Jenkinson HF, Dymock D. Treponema denticola chymotrypsin-like proteinase (CTLP) integrates spirochaeteswithin oral microbial communities. Microbiology. 2012 Mar;158(Pt 3):759-70. Epub 2012 Feb 7. PMID:22313692

Sapi E, Kaur N, Anyanwu S, Luecke DF, Datar A, Patel S, Rossi M, Stricker RB. Evaluation of in-vitro antibiotic susceptibility of different morphological forms of Borrelia burgdorferi. Infect Drug Resist. 2011;4:97-113. Epub 2011 May 3. PMID:21753890

Stricker RB, Johnson L. Lyme disease: the next decade. Infect Drug resist. 2011; 4: 1-9. PMID: 21694904

Sapi E, Bastian SL, Mpoy CM, Scott S, Rattelle A, Pabbati N, Poruri A, Burugu D, Theophilus PA, Pham TV, Datar A, Dhaliwal NK, MacDonald A, Rossi MJ, Sinha SK, Luecke DF. Characterization of biofilm formation by Borrelia burgdorferi in vitro. PLoS One. 2012;7(10):e48277. Epub 2012 Oct 24. PMID:23110225

lease of bacteria in the human body will be like a dangerous tornado in a field. It is a wise concern.

For these two problems regarding biofilm-held infections suddenly being released, here are useful solutions:

1. You need many infection killing options for use since more is better to prevent “seeding” of dispersed infection.
2. You want the biofilm killing options to destroy biofilms by different mechanisms. This makes the dispersed seeded infections naked to the immune system.
3. Biofilm tools are given initially at low doses and then increased gradually to large doses since often in the beginning patients have massive inflammation and a drastic increase in killing of biofilm organisms in a short time could cause trouble with bone marrow, liver, heart, eye, or kidney issues, or merely create more dead infectious debris resulting in patient misery.
4. You may need to pulse (use every other day) or fully stop this treatment because once a wave of biofilm eroding agents strips off or severely damages a biofilm of an infection, the same antibiotics that were useless in the past can become very effective.
5. There is no single master biofilm destroyer, yet some are broader than others.

Bartonella and Babesia Biofilms?

Most people have heard of the profoundly common tick infection Lyme disease, but they may not know Bartonella is more common than Lyme and is carried by far more vectors (Breitschwerdt). Babesia decimated the cattle population in the southern United States many decades ago and is more dangerous in humans than Lyme.

Currently, we have no solid data showing Bartonella and Babesia have biofilms.

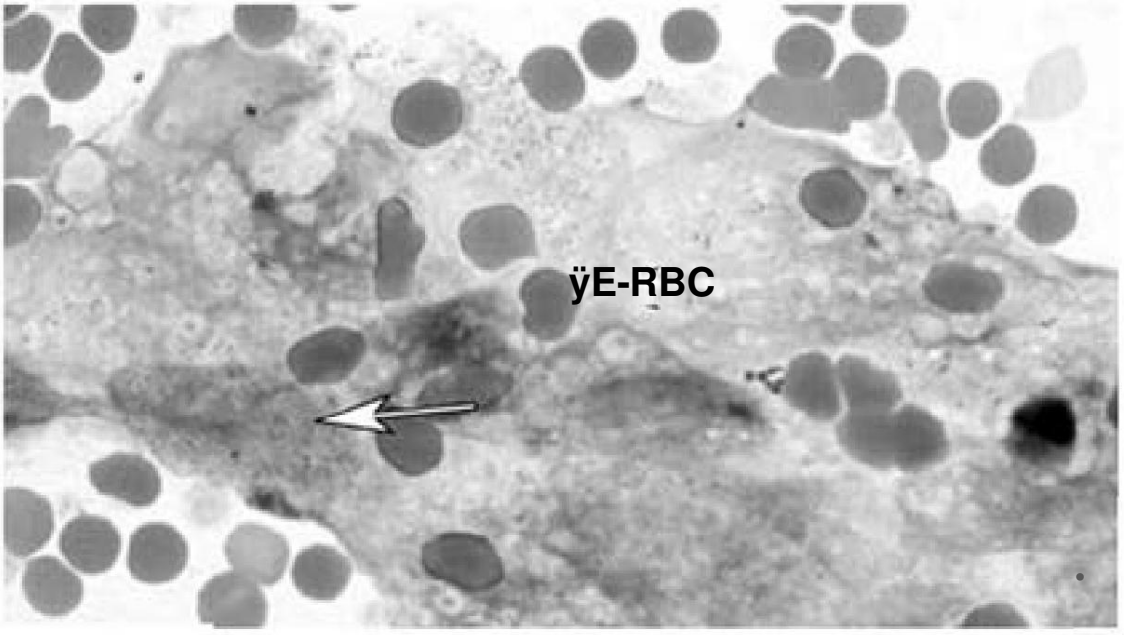
Tick and Flea-Borne Biofilms Conclusion

Below you will see that mouth spirochetes routinely have biofilms. Another spirochete is Leptospira which is able to make biofilms in many environments and may contribute to lost pregnancy in mammals (Brihuega).

In terms of tick and flea infection biofilms, I would focus on **FL1953** (Protomyxzoa) and Lyme, since both have been known and treated by us since 2006, though the former was killed without knowing its genetic uniqueness. We are learning what decreases their biofilm pathology and have agents that should work if one is open to look at diverse approaches. A synthetic "antibiotic only approach" to biofilms, including antibiotics targeted to hit biofilms, might be similar to typing with one finger.

There are herbalists, such as Stephen Buhner, who propose selected herbs to treat some tick infections. And, in terms of **primary treating herbs to kill organisms,** there are also credible options that are not always herbal in use for a tick or flea infection. We will continue to use **advanced lab testing,** typically only allowed under physician supervision, to determine by serious extensive ***indirect*** **blood exam** biochemistry tests to see which infection is actually destroyed in people experiencing benefit from herbal therapy. In any event, I enjoyed this line from Buhner: *"I can't really say what will clear all biofilms."*

Outra imagem de amostra de biofilme



O mundo escuro oVIls ai:e **sangue vermelho "°Us (-lâmina para cima« corvo), Tho "folha" que** começa **de lllo direito baixo«** '°'11«, **move-se em direção ao oomer superior esquerdo, é um** biofill,\ **rnllfffial O lOW vai cortar poi111i11g para um pequeno bam:rium.(Piy Labaratoriea)**

Noções básicas de eugenol

O eugenol é encontrado em muitos óleos essenciais e ervas. Por exemplo, é encontrado em alta potência no óleo essencial de cravo, mas também em doses mais baixas na folha de canela e seu óleo essencial. Também é encontrado em óleos de pimentão, louro, sassafrás, casca de massoy, óleo de cânfora e plantas chamchwi, de acordo com PubChem. A potência e a concentração variam amplamente dependendo da fonte e do método de extração. Além disso, este não é apenas um poderoso agente de biofilme; tem outras propriedades surpreendentes, como ações antivirais e efeitos anticancerígenos.

Por exemplo, Tragoolpua e Jatisatienr mostraram que o eugenol afeta o herpes oral e genital dependendo da espécie, cepa e outros fatores. Eles deixaram claro que o óleo essencial pode ser mais poderoso que um simples extrato. Na verdade, o Herpes oral e genital, HSV-1 e HSV-2, respectivamente, não conseguiram reproduzir-se na presença de eugenol. Al-Sharif mostrou efeitos significativos sobre o câncer. Uma concentração muito baixa (2 µM) apresenta toxicidade específica contra diferentes células de câncer de mama. Este efeito de morte foi mediado pela indução de uma via de morte das células cancerígenas e pela diminuição dos níveis de E2F 1 e survivina – duas moléculas que são essenciais para a sobrevivência celular. Também prejudico

genes. Importantly, these anti-proliferative and pro-cancer cell death effects were also observed inside body grafts placed in non-human animals.

http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=3314

Tragoolpua Y, Jatisatienr A. Anti-herpes simplex virus activities of Eugenia caryophyllus (Spreng.) Bullock & S. G. Harrison and essential oil, eugenol. Phytother Res. 2007; 21(12):1153-8.

Al-Sharif I, Remmal A, Aboussekhra A. Eugenol triggers apoptosis in breast cancer cells through E2F1/survivin down-regulation. BMC Cancer. 2013 Dec 13;13(1):600. [Epub ahead of print]

Eugenol and Biofilms

Recently, Dr. Zhou has reminded us of a special process that is involved in the formation of dangerous biofilms. Basically, many bacteria have a "chatty" way of talking to other cells such as other bacteria. So, bacteria use chemicals or cause other bacteria to make chemicals to help them survive and often act to harm you or a loved one.

Eugenol is so effective that at very low amounts, it still disrupted bacteria chemical communication. This is very important in a biofilm destroying agent. If cells cannot communicate, it is doubtful they can form communities. Biofilms are community creations. **Further, eugenol at very low doses, called "sub-inhibitory concentrations" inhibited biofilm formation.**

One type of biofilm research being conducted compares biofilm killers head to head. The results are not always the same, perhaps in part because the infections are not always the same. Note that in an Epub abstract before publication, Malic explains that the best essential oil for urinary catheters, with or without biofilms, against fourteen different bacteria was eugenol. This is why I believe this substance is a "double killer." It can defeat many biofilms, and then kill the organism making the biofilm. Finally, in this study, eugenol did better than tea tree oil.

Linalool

According to the Merriam-Webster dictionary, the word linalool is derived from a Medieval Latin phrase meaning “wood of the aloe.” Linalool has a nice smelling alcohol and essential oils. It is used in perfumes, soaps, and flavoring materials.

In terms of biofilms, it seems to be most effective when **the essential oil part** is used, which has **the most evidence of killing Candida albicans.** (Candida albicans is the cause of yeast infections.) Yet, again, it is the essential oil fraction that not only **inhibits the growth** of Candida albicans but also of the bacteria Lactobacillus casei, Staphylococcus aureus, Streptococcus sobrinus, Porphyromonas gingivalis and Streptococcus mutans cell suspensions, all of them associated with oral cavity disease, according to Alviano and Mendonça-Filho. Yet, Budzyńska reported this essential oil did not fully remove biofilms formed by Staphylococcus aureus (ATCC 29213) and Escherichia coli (NCTC 8196) on the surface of routine medical materials such as urinary catheters, infusion tubes and surgical mesh.

Hsu found that linalool could be effective against Candida albicans due to its many genetic blocking effects. For example, using a scanning electron microscope and other technology, many signs of the effect of linalool to destroy Candida or inhibit its growth could be noted. Hsu found blocking actions against genes involving adhesion production and the formation of “branches” or the mold’s hyphae were both decreased by linalool.

http://www.merriam-webster.com/dictionary/linalool

Budzyńska A, Wieckowska-Szakiel M, Sadowska B, Kalemba D, Rózalska B. Antibiofilm activity of selected plant essential oils and their major components. Pol J Microbiol. 2011;60(1):35-41. PMID:21630572

Alviano WS, Mendonça-Filho RR, Alviano DS, Bizzo HR, Souto-Padrón T, Rodrigues ML, Bolognese AM, Alviano CS, Souza MM. Antimicrobial activity of Croton cajucara Benth linalool-rich essential oil on artificial biofilms and planktonic microorganisms. Oral Microbiol Immunol. 2005 Apr;20(2):101-5.

Reserpine

Reserpine is a substance found in the roots of some types of Rauwolfia that has been made into a traditional medicine. It is used to lower high blood pressure and help with psychotic symptoms, but side effects have limited its use.

While it may not be comfortable to use at modest or high dosing, very low dosing, according to Magesh, showed it to be profoundly powerful against Klebsiella pneumoniae. In one report, he used reserpine and was able to stop biofilms in this pneumoniae infection at a fraction of the dose thought to inhibit growth.

Specifically, a tiny fraction of this drug, a mere 0.0156 mg/ml, stopped biofilm production in Klebsiella pneumoniae. So, it may be possible that we have another example of a medical truth I use every day:

"Change the dose and you change the drug or herb."

In this case, perhaps it is possible that 1/10th of the lowest size tablet, 0.1 mg, could harm Klebsiella and other infections and be safe for the patient. However, the raw materials for making it may be hard to find some months according to ASHP who tracks pharmacy shortages.

Magesh H, Kumar A, Alam A, Priyam, Sekar U, Sumantran VN, Vaidyanathan R. Identification of natural compounds which inhibit biofilm formation in clinical isolates of Klebsiella pneumoniae. Indian J Exp Biol. 2013 Sep;51(9):764-72.

http://www.ashp.org/DrugShortages/Current/Bulletin.aspx?id=975

"Stacking" Biofilm Killers

While physicians may ponder the problems caused by biofilms in practice, I rarely encounter the doctor who understands that it is usually better to have more than one treatment. In the article below, **oral biofilm infections were controlled best by three agents, not merely one.** For example, Alves explains that when you are going to irrigate or clean a root canal area, that two mouth bacteria infections protected by their biofilms have these same film barriers decreased significantly by treatment with farnesol, xylitol and lactoferrin together.

The same results were found in wounds. One of the best treatments for wounds is the use of a silver-based wound dressing or bandage, together with a gel containing xylitol and lactoferrin (Ammons).

Alves FR, Silva MG, Rôças IN, Siqueira JF Jr. Biofilm biomass disruption by natural substances with potential for endodontic use. Braz Oral Res. 2013 Jan-Feb;27(1):20-5. PMID:23306623

Ammons MC, Ward LS, James GA. Anti-biofilm efficacy of a lactoferrin/xylitol wound hydrogel used in combination with silver wound dressings. Int Wound J. 2011 Jun;8(3):268-73. Epub 2011 Apr 1. PMID:21457463

Terpenoids

I would like to mention a class of options that come from a familiar substance, chemicals from tea tree oil. We have already mentioned linalool which is part of this class individually, since it comes up as a leading biofilm killer. According to Raut, as many as 14 terpenoids derived from tea tree oil inhibit biofilms, and α-terpineol, nerol, isopulegol, carvone, linalool, α-thujone and farnesol are worthy of special note. Eight terpenoids have effects on **mature** yeast biofilms (Candida albicans).

A study by Ramage shows tea tree oil (TTO), terpinen-4-ol (T-4-ol), and α-terpineol displaying potent activity against 69 biofilm-forming Candida strains, of which T-4-ol and α-terpineol displayed rapid kill action.

Of these three, T-4-ol displayed no significant toxicity to cells. These data provide further laboratory evidence that TTO and its derivative components, specifically T-4-ol, exhibit strong antimicrobial properties against fungal biofilms. Further, T-4-ol appears to possess safety advantages over the complete essential oil (TTO) and may be suitable for prevention and treatment of established oral and upper throat cavity candidosis. Certain terpenoids are components of spices or food ingredients generally regarded as safe (GRAS) (Pauli 2006).

In another study, several chemicals from plants were tried against two very common bacteria (Budzyńska), Staphylococcus aureus (ATCC 29213) and Escherichia coli (NCTC 8196), both with biofilms on the surface of ***routine*** medical products, i.e., urinary catheter, infusion tube and surgical mesh. All three are present in most advanced hospitals and other settings. Surgical mesh was the surface most prone to persistent colonization since the biofilms that formed on it, both by S. aureus and E. coli, were difficult to destroy.

Melaleuca alternifolia is the source of Tea Tree Oil (TTO). Lavandula angustifolia yields Lavender, English Lavender and True Lavender (LEO). Melissa officinalis is Lemon balm (MEO). Tea Tree oil, Lemon balm, alpha-terpineol and terpinen-4-ol showed stronger anti-biofilm

Allicin and Garlic

Garlic has been used as a medicine throughout human history. Allicin is considered one of the medically useful components of garlic. Other useful components are discussed in Chinese language pharmacology texts.

As early as 2003, the use of allicin against Staphylococcus epidermidis had reported effects on biofilm formation at low dosing. Pérez-Giraldo reported that lab testing showed that allicin diminished biofilm formations.

Lihua reported ten years later that allicin impacts Pseudomonas aeruginosa biofilm. This is hardly casual information, since P. aeruginosa is likely resistant to multiple antibiotics, and this resistance may be due to biofilms. Organosulfur allicin has been shown to inhibit surface-adherence of bacteria and Lihua demonstrated that allicin could inhibit early bacterial adhesion which is a first step to bacterial community formation, usually just before biofilm production.

Other researchers isolated various components of garlic and tested the most active components. The following three components were examined:

1. garlic extract
2. allicin
3. diallyl sulfide (DAS)

They were tested against the serious mouth and dental infection Aggregatibacter actinomycetemcomitans, the primary cause of severe aggressive periodontitis and other non-oral infections.

Lumbrokinase

We appreciate that some people interested in progressive medicine feel this enzyme, Lumbrokinase, is a useful substance. Some have suggested it is useful in the removal of biofilms. If that is true, we had trouble finding the evidence for that position. However, it does seem that some researchers see a potential for this enzyme to "digest" pathological clots. This possibility seems to have some support, and at this time we will only wait for further research. Since we are only proposing biofilm options that are supported by research and since human use is just starting in research settings, we do not promote this agent at this time.

Ryu GH, Park S, Han DK, Kim YH, Min B. Antithrombotic activity of a lumbrokinase immobilized polyurethane surface. ASAIO J. 1993 Jul-Sep;39(3):M314-8. PMID:8268550

Kim JS, Kang JK, Chang HC, Lee M, Kim GS, Lee DK, Kim ST, Kim M, Park S. The thrombolytic effect of lumbrokinase is not as potent as urokinase in a rabbit cerebral embolism model. J Korean Med Sci. 1993 Apr;8(2):117-20. PMID: 8397927

Mihara H, Sumi H, Yoneta T, Mizumoto H, Ikeda R, Seiki M, Maruyama M. A novel fibrinolytic enzyme extracted from the earthworm, Lumbricus rubellus. Jpn J Physiol. 1991;41(3):461-72. PMID:1960890

Wang KY, Tull L, Cooper E, Wang N, Liu D. Recombinant Protein Production of Earthworm Lumbrokinasefor Potential Antithrombotic Application. Evid Based Complement Alternat Med. 2013;2013:783971. Epub 2013 Dec 12. Review. PMID:24416067

Cao YJ, Zhang X, Wang WH, Zhai WQ, Qian JF, Wang JS, Chen J, You NX, Zhao Z, Wu QY, Xu Y, Yuan L, Li RX, Liu CF. Oral fibrinogen-depleting agent lumbrokinase for secondary ischemic stroke prevention: results from a multicenter, randomized, parallel-group and controlled clinical trial. Chin Med J (Engl). 2013 Nov;126(21):4060-5. PMID:24229674

Huang CY, Kuo WW, Liao HE, Lin YM, Kuo CH, Tsai FJ, Tsai CH, Chen JL, Lin JY. Correction to Lumbrokinase Attenuates Side-Stream-Smoke-Induced Apoptosis and Autophagy in Young Hamster Hippocampus: Correlated with eNOS Induction and NFκB/iNOS/COX-2 Signaling Suppression. Chem Res Toxicol. 2013 Jul 15;26(7):1126. Epub 2013 Jun 7. PMID:23746067

tract also made the pneumonia far more susceptible to the antibiotic tobramycin. Further, genes involved with resistance to antibiotics were down-regulated.

- Bag published that highly resistant urine organ infections were more vulnerable to treatment with T. chebula but proposed this is due to its ability to collect iron, since adding iron reduced its effect. However, Bag only tested one of many chemicals from this fruit, and I would suggest other components may have antibacterial action and work by other means.
- Four carefully chosen antibacterial plants *(P. guajava, T. chebula, A. aspera,* and *M. elengi)* are combined with four solvent extracts (hexane, ethyl acetate, ethanol, and methanol) by Kamal Rai Aneja, who initially evaluated their anti-cavity activity against *S. mutans.* All four of the plants showed activity against *S. mutans.* Ethyl acetate extracts of the four plants showed high antibacterial activity against *S. mutans,* superior to the other solvent extracts. Further, *T. chebula* ethyl acetate extract acts as an effective anti-cavity agent by inhibiting *S. mutans* and *C. albicans.* However, we were unable to find evidence if the benefit of these chemicals involved biofilm removal.

In conclusion, we appreciate that this medicine is proposed to both dissolve Lyme biofilms and also destroy the underlying Lyme bacteria. We offer no opinion on this belief. We do not want to oppose or support its use in terms of biofilm ability. It appears this fruit does act on the bacteria biofilm of P. aeruginosa, but Lyme bacteria are not the same as P. aeruginosa bacteria. Lyme is also profoundly more genetically complex than a “relative” spirochete bacterium, syphilis.

Therefore, while we do note that this medicine has antibacterial and cell protection actions, and **we accept some patients feel better,** we presently cannot say it is due to biofilm removal in those with tick-borne infections.

Cancer

Cancer has many causes. Some things increase your risk and other things can decrease your risk. It is rarely pure genetics, even in those with genetic vulnerability. We know some types of plastics increase rates of breast cancer. We know the 200 poisons in cigarettes cause lung cancer. We know various chemicals made by various companies can increase cancer, despite the reality that most US and international chemicals have limited or no top research on their safety.

I like my dental hygientist. And, I like making sure my gums and teeth are "safe." Why? At first it was because I want to have teeth in twenty years. But, she correctly reminds me that heart attacks are increased by gum disease which is routine in many countries.

Yet, even this passionate healer was not aware of the role of biofilms in cancer. Yes, I said cancer. We are only beginning to understand the role of infections in triggering cancer diseases.

Many years ago, I was working with a physician who asked me to help research possible cures for his cancer. Eventually, that cure was found and written up, taking over 200 hours and many months to complete, with the help of a top medical editor in North America—the former editor of the *Journal of the American Medical Society* and forty other journals, specifically, George Lundberg, who worked feverishly to get this death disorder cure in print ASAP (Schaller).

Years later, he asked me to write a follow up, and we had found that over eight top infection specialists in the United States had missed Babesia, a common parasite that is harder to kill than malaria and which can occasionally increase eosinophils (Schaller). The patient's trouble included the fact that he had so many eosinophils, his blood could clot quickly. The point? Eosinophils are a type of white blood cell designed to kill parasites. The man's disorder (HES) Idiopathic Hypereosinophilic Syndrome, which is often fatal and means that eosinophils reproduce out of control, was primed by a Babesia infection. Not all patients with HES also have a Babesia infection, but after writing six books which

Lactoferrin Xylitol Combination Treatment

In a fascinating look at this proposed double treatment, Mary Ammons shares that treatment of Pseudomonas aeruginosa biofilm with both lactoferrin and xylitol inhibits the ability of bacteria to respond to damage resulting from lactoferrin iron chelation.

Pseudomonas aeruginosa has been identified as the most common biofilm-forming infection in chronic wounds. The immune stimulating molecule lactoferrin and the rare sugar alcohol xylitol, together, were effective in the lab against P. aeruginosa biofilms.

How? Lactoferrin iron chelation was identified as the primary means by which lactoferrin undermines the bacterial membrane. Amazingly, this combination showed huge alterations in the expression of the bacteria's genes, but these changes are too complex for a summary. The findings mean that critical chemicals made by P. aeruginosa had changed.

Siderophore detection verified that xylitol is the component of this unique double treatment that inhibits the ability of the bacteria to produce siderophores under conditions of iron restriction. Siderophores sound complicated—here is the simple meaning: they are some of the strongest iron binders in the world and they are made by bacteria, viruses and fungi.

The study concludes with two points:

1. Lactoferrin treatment of P. aeruginosa biofilms results in destabilization of the bacterial cell membrane through iron chelation.

2. Combining lactoferrin and xylitol inhibits the ability of P. aeruginosa biofilms to respond to environmental iron restriction.

Access to iron is profoundly hard for bacteria when this combination is used.

Erythritol

Erythritol is an amazing sugar. For example, when it was given to children head-to-head with xylitol or sorbitol it was clearly superior. Here is a summary of the research:

Runnel writes: "Three-year consumption of erythritol-containing candies by initially 7- to 8-year old children was associated with reduced plaque growth, lower levels of plaque acetic acid and propionic acid, and reduced oral counts of mutans streptococci compared with the consumption of xylitol or sorbitol candies."

In a similar way, Japanese researchers show highly advanced reasons for erythritol superiority over xylitol and sorbitol (Hashino). While this study is very dense, let me at least try to list the stunning findings:

1. By advanced confocal microscopic observations, the most effective sugar used to reduce P. gingivalis accumulation onto an S. gordonii substratum was erythritol, as compared with xylitol and sorbitol.

2. In addition, erythritol moderately suppressed S. gordonii monotypic biofilm formation.

3. To examine the inhibitory effects of erythritol, they analyzed the metabolomic profiles of erythritol-treated P. gingivalis and S. gordonii cells. Metabolome analyses showed that a number of critical bacteria chemicals were decreased by erythritol.

4. Next, metabolites of erythritol- and sorbitol-treated cells were examined. Erythritol significantly decreased the levels of P. gingivalis dipeptides. They tended to be increased by sorbitol.

Amazingly, it appears erythritol has inhibitory effects on two diverse species with biofilms, and it acts by at least five very distinct mechanisms.

Dowd reported that biofilm formation was completely inhibited in a standard wound approach by 10% erythritol in either of the two San-

Does Magnesium Deprivation Hinder Biofilms?

Before we decide to remove an element that is used in vast numbers of important enzymes, we have to have a foundation. First, in some basic physiology texts, calcium displaces magnesium inside human cells. My impression of this research is that suboptimal magnesium increases systemic inflammation, vascular death such a heart attacks, and cancer. Dibaba shows that the higher the magnesium in diet the lower C-reactive protein. This protein is associated with inflammation. If you lower inflammation you decrease deaths.

Qu pooled studies of approximately a half a million people to examine the results. The greatest risk reduction occurred when magnesium intake increased from 150 to 400 mg/day. A significant inverse association was found between dietary magnesium intake and total cardiovascular events. Serum magnesium concentrations are linearly and inversely associated with the risk of cardiovascular troubles such as heart attacks and brain strokes. Since magnesium is poorly absorbed even when chelated to an amino acid, it is perhaps useful to note the useful dose was 400 mg, when compared to minimal benefit from 150 mg orally.

Del Gobbo also examined vast studies and wrote: “Clinical hypomagnesemia and experimental restriction of dietary magnesium increase cardiac arrhythmias.” Deadly ischemic heart disease, in which a person dies due to poorly oxygenated blood reaching the entire heart, was more common in those with no magnesium supplementation or very low oral magnesium dosing. Simply, “circulating and dietary magnesium are inversely associated with [cardiovascular disease].” Further, Qu shows, in another study, a significant drop in intestinal cancers with a reasonable magnesium intake. While we may not know the mechanism for these useful findings, they are not felt to be due to chance.

Song and Leff clearly show why a small number of scientists and physicians have pondered lowering human magnesium Mg^{2+} levels. They remind us that Mg^{2+} can influence bacterial adhesion, which is part of biofilm process. In their study, the bacterium Pseudomonas fluorescens was used to investigate the influence of Mg^{2+} on biofilm growth.

Nitroxoline

We are not going to spend significant time on this fifty year-old antibiotic because it is not used in many countries, and it is a quinolone, and quinolones all seem to have serious risk of tendon damage. For example, it is possible nitroxoline has the same risks as other quinolones (www.drugbank.ca/drugs/DB01422).

Quinolones easily enter cells and are often used to treat intracellular pathogens such as Mycoplasma pneumoniae.

The FDA has increased warnings regarding side effects since the drugs were first approved. I just want to focus on three side effects that might not be routine but are possible risks with many quinolones:

- Damage to nerves outside the brain: This could present as sensory nerve or muscle nerve injury causing paresthesias, hypoaesthesias, dysesthesias, and weakness. New pain, burning, tingling, numbness and/or weakness, or new decreased abilities to detect light touch, pain, temperature, position sense, vibratory sensation, and/or motor strength are basic nerve functions and show damage; these are reasons to stop taking the drug.
- Tendon damage: While some focus on the Achilles tendon, actual tears of tendons have occurred in the hand, the shoulder, the thigh, or other locations. Some are helped with surgery. Other patients feel the surgical or other treatment still leaves them with damage. It is believed by some that the use of prednisone and other cortical steroids meant to drop inflammation increases the risk of tendon damage. Perhaps this is especially true in older seniors. Surprisingly, tendons can rupture after the medication is stopped. Some have suggested that IV, transdermal or sublingual magnesium might decrease the risk, but I am not aware this hypothesis has been proven (Schaller).

Aspirin and NSAIDS

We have previously said it is best to see biofilms like a key, and using AIDS as an example, it was only after AZT in 1996 with **the arrival of protease inhibitors that those quickly dying, experienced a "Lazarus effect," in which AIDS patients who looked to be ready to die recovered markedly in 30 days.** Medications used in AIDS are tough medications, even if they are miracles. Some may question offering a section on the tough medications aspirin and NSAIDS.

While we appreciate that aspirin and various other over the counter NSAIDS may not be optimal, perhaps due to concerns of liver, kidney or ulcer issues, we are discussing infections that invade and cannot be stopped by your body. You might need all the help you can get. So we offer some synthetic options here that may offer help against a top killing and disabling problem—**biofilm-protected** infections.

For example, fluconazole-resistant Candida is increasing worldwide. Fluconazole is also called Diflucan. Biofilms are one reason for a decreased effect in treatment. Aspirin, diclofenac, ketoprofen, tenoxicam, and ketorolac all undermined biofilms or their processes. They all reduced fungal adhesion, and increased biofilm detachment with low concentrations of anti-inflammatory agents. Microscopic examination confirmed the tested drugs had a significant effect on reduction of Candida adhesion and biofilm development. The drugs also made fluconazole work more effectively against fluconazole-resistant C. albicans (Abdelmegeed).

Another useful way to involve aspirin is by teaming it up with the chelation chemical EDTA. Both aspirin and EDTA possess broad antimicrobial activity for biofilm cultures. Aspirin used for 24 hours was successful in eradicating P. aeruginosa, E. coli and C. albicans biofilms. Moreover, exposure to the Aspirin-EDTA combination completely destroyed bacterial biofilms after only four hours in simulation lab testing (Al-Bakri).

Azithromycin (Zithromax)

This medication is almost a household name and is known as the "Z-Pak" which contains brand name Zithromax pills that are still in use today. Despite being in use many years and used very routinely, this medication still has a strong use in addressing biofilms.

For example, Maezono showed that azithromycin was markedly superior compared to other routine antibiotics in killing gum infection bacteria. Specifically, azithromycin at **very low dosing** undermined four strains of Porphyromonas gingivalis. This determination involved the use of two fascinating techniques.

Azithromycin dropped the bacteria "gasoline" or ATP in the bacteria, which means the bacteria had decreased function or were dead. Cyanide kills humans in part due to dropping ATP levels—it is not a trivial substance. Further, the power of azithromycin was seen clearly with a confocal laser scanning microscope, which has the ability that the long name suggests—seeing the decreased amount of bacteria.

One of the most common hospital infection risks is MRSA; it causes a number of potentially deadly diseases. This "MRSA"simply means routine staph aureus is no longer able to be killed or it is resistant to methicillin, so it reproduces unchecked. Azithromycin is proposed as one solution to MRSA based partly on its biofilm defeating abilities at very low dosing.

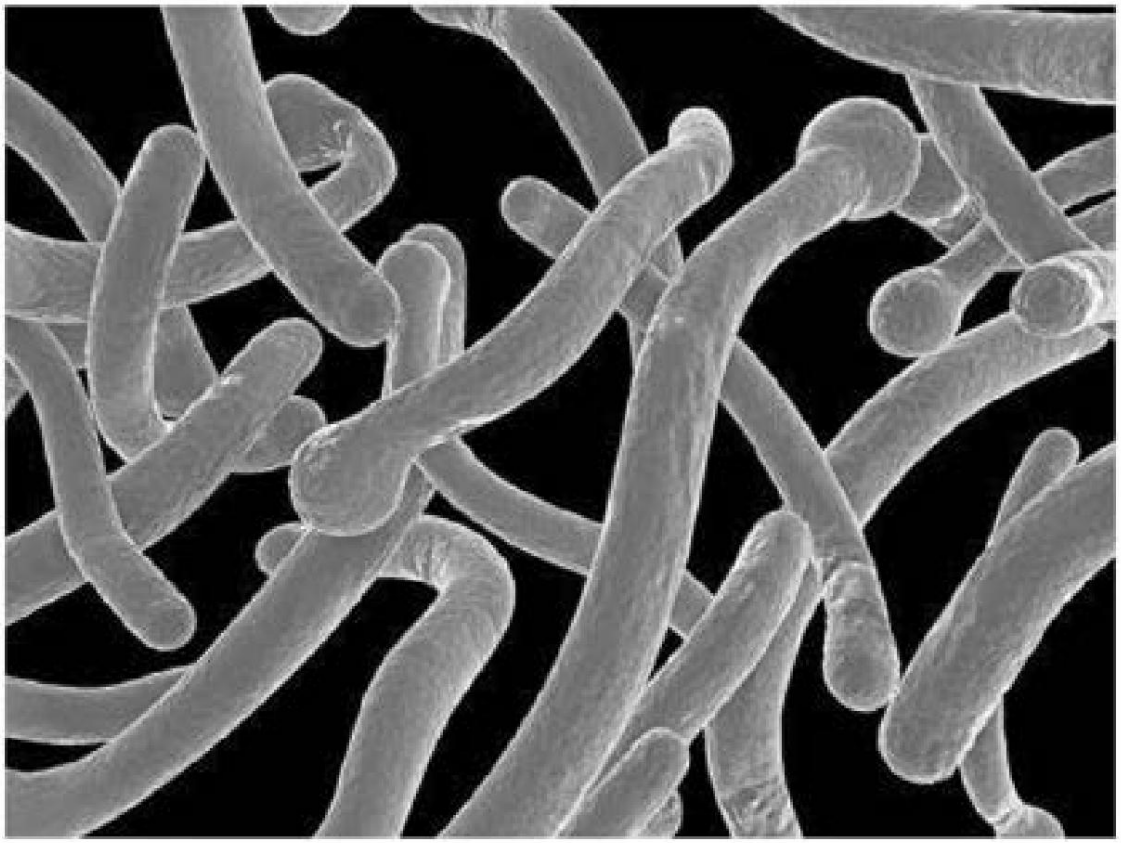
Gui shows that azithromycin was active against methicillin-resistant Staphylococcus aureus (MRSA) strains. It reduced the production of α-hemolysin and biofilm formation at very low "sub-inhibitory" concentrations. So, azithromycin may be useful in the treatment of α-hemolysin-producing and biofilm-forming MRSA infections.

Maezono H, Noiri Y, Asahi Y, Yamaguchi M, Yamamoto R, Izutani N, Azakami H, Ebisu S. Antibiofilm effects of azithromycin and erythromycin on Porphyromonas gingivalis. Antimicrob Agents Chemother. 2011 Dec;55(12):5887-92. Epub 2011 Sep 12. PMID:21911560

Prata

O tratamento com prata utilizado contra os biofilmes nas feridas tem sido claramente eficaz. Na verdade, um creme de prata a 1% tem sido utilizado com sucesso para tratar e prevenir infecções em pacientes com queimaduras em todo o mundo.

Uma revisão do Instituto Internacional de Infecção de Feridas mostra que os dados ainda apontam a prata como o melhor tratamento. Por exemplo, Monteiro testou a prata coloidal contra biofilmes fúngicos. A conclusão desse trabalho é muito firme: independentemente das concentrações utilizadas no estudo, a prata afetou a composição da matriz e a estrutura dos biofilmes de Candida.



Close renderizado tridimensional de Candida albicans.

Cumanda and Biofilms

Dr. Eva Sapi and her colleagues found in their superior laboratory that cumanda had some mild killing effects on the Lyme bacteria, but more importantly for this book, Lyme **biofilm** communities grown in her lab were reduced 43% by this herb at low dosing. The dosing for a dynamic human or animal body was not explored or proposed by this researcher or any other researcher as of February 2014. Searching by its Latin and popular name did not yield any articles relevant for use on infections.

Finally, while Lyme disease is a common and disabling infection, it is hardly the only infectious agent in the many infections carried by Ixodes ticks. While this preliminary research is very useful, it is possible cumanda may have impact inside a body for Lyme and Bartonella treatment. More study is needed. I regret that we only examined cumanda for Bartonella and not Lyme.

Our conclusion was that cumunda hindered Bartonella more than Levaquin (levofloxacin), Zithromax (azithromycin), Rifabutin (mycobutin) and other proposed options. To determine treatment effect one needs to know **the indirect actions of Bartonella, Babesia, FL1953, Lyme, inflammation systems, etc. by *lab analysis using different companies.***

Theophilus PA, Burugu D, Pourur i A, Luecke DF. Sapi E. Effect of Medicinal Agents on the Different Forms of Borrelia burgdorferi Lyme disease or Lyme borreliosis is a tick-borne multisystemic disease caused by different species of Borrelia. http://healthyeats-nl.blogspot.com/2013/07/effect-of-medicinal-agents-stevia-and.html

Erythromycin

Gomes found that erythromycin at low doses actually enhanced the growth of biofilms in C. diphtheriae. Penicillin acted the same way. Of further concern is that not only did these antibiotics increase biofilm formation but in this case they enhanced infections by strains of C. diphtheriae. Diphtheriae is a very dangerous infection without access to effective antibiotics. It is dangerous enough with good ones.

Returning to biofilm-promoted gum disease such as gingivitis, in the United States, over 50% of adults had gingivitis on an average of 3 to 4 teeth. Adult periodontitis, measured by the presence of periodontal pockets > or = 4 mm, was found in about 30% of the population on an average of 3 to 4 teeth. Lost gum attachment to teeth of at least 3 mm was found in 40% of the population (Oliver).

The density of adherent P. gingivalis cells were significantly decreased by using erythromycin at very low dosing called “sub-MIC levels.” One strain was not affected by erythromycin. Finally, erythromycin was not effective for inhibition of P. gingivalis biofilm cells at very low dosing.

Erythromycin Key Findings

- Low doses actually grew some biofilms
- Penicillin also grew some biofilms
- It enhanced strains of dangerous C. diphtheriae
- Gum disease from P. gingivalis cells was much less sticky at very low dosing.
- Erythromycin was not effective for inhibition of P. gingivalis biofilm cells at very low dosing.

Contacting Dr. Schaller

Should you wish to talk to Dr. Schaller he offers individualized education consults, which can be arranged by calling 239-263-0133. Please leave all your phone numbers, a working email and a fax number. These consults are typically in 15 minute units and can last as long as you wish. All that is required is the completion of a short informed consent form.

If you would like a full diagnostic consult or to see Dr. Schaller as a patient, know he treats patients from all over the USA and from outside the country. He meets with you first and then does follow-up care with you by phone.

If you would like to fly in to see Dr. Schaller, his staff are very familiar with all the closest airports, and we have special hotel discounts.