

*"Providing a forum to exchange information
on protecting the food supply"*

BCFPA Grapevine

2017 May Spring Speaker's Evening Sanitation and Biofilm Challenges in the Food Industry - A Chemical Company's Perspective

Your BCFPA will be organizing a Spring Speaker's Evening this May. The event will take place at the Langara Clubhouse (Golf Course) (6706 Alberta Street, Vancouver, BC) on **Wednesday, May 31, 2017**. Our event has been generously sponsored by **Sani Marc**.

The Speaker's Evening will be presenting topics on food safety challenges and real life examples from a sanitation perspective, and microbial challenges that biofilms present to food manufacturers. There will be an opportunity to network with local food safety professionals from academia, government and industry.

Benoît Gagnon, and **Brian March**, both from **Sani Marc Inc**, will be our two guest speakers. Our event topic will be, **"Sanitation and Biofilm Challenges in the Food Industry - A Chemical Company's Perspective"**.

Chemical companies are often asked to assist with troubleshooting sanitation problems or contamination investigations. As a result, they gain broad experience and knowledge of the unusual places that issues can hide. This

presentation will focus on real life examples of issues involving *Listeria*, allergens, dismantling of equipment and drains and cooling units in places you may not have considered. Benoît will present on **"Food Safety - A Chemical Company's Perspective"**.

Biofilms have been an industry buzzword for many years. However, recent developments in research on the science of biofilms has resulted in a greater understanding of how they form, their characteristics and effect of their presence. This presentation will focus on understanding the microbial challenges they present to food manufacturers and the impact on food safety. Recent advances in detection and eradication methods will also be discussed. Brian will present on **"Biofilm in Food Production Environments"**.

Online registration, schedule, registration fees, speakers and topic abstracts can be found on our website:

www.bcfoodprotection.ca

Early bird registration deadline:
May 15, 2017.



**BC FOOD
PROTECTION
ASSOCIATION**

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President's Report



Hello fellow members, thank you for your continuing support of the BC Food Protection Association!

I am honoured to serve as President of BCFPA for the second consecutive year. This year, we welcome new board members to our executive team – Justin Falardeau (2016 Student Scholarship Award Recipient), Siyun Wang (Assistant Professor of Food Safety Engineering, University of British Columbia) and Neda Rahimi (Senior Quality Control Manager, Sunrise Poultry Processors Ltd.). With the support of the executive and volunteers, I hope to bring another exciting year with the anticipated two Speaker's Evening. More information about your executive is available on our website www.bcfoodprotection.ca.

Our 2016 Annual General Meeting was a success with 35 attendees earlier this year. Do visit page 7 of the newsletter for the event summary written by our student volunteer.

We will be hosting the 2017 Spring Speaker's Evening at the Langara Clubhouse (Golf Course) in Vancouver, BC on May 31, 2017. Sponsored by Sani Marc, the event will include two interesting speakers who will present on "Food Safety - A Chemical Company's Perspective" and "Biofilm in Food Production Environments". More details about the event and registration can be found in the newsletter as well as on our website. Please be sure to register early and take advantage of our early bird rates!

I would like to invite you to attend the IAFP Annual General Meeting on July 9 - 12, 2017 Tampa Convention Center in Tampa, Florida. The IAFP Annual Meeting is attended by more than 3,400 of the top industry, academic and governmental food safety professionals from six continents. The meeting provides attendees with information on current and emerging food safety issues, the latest science, innovative solutions to new and recurring problems, and the opportunity to network with thousands of food safety professionals from around the globe. More information about the conference and registration can be found at <https://www.foodprotection.org/annualmeeting/>

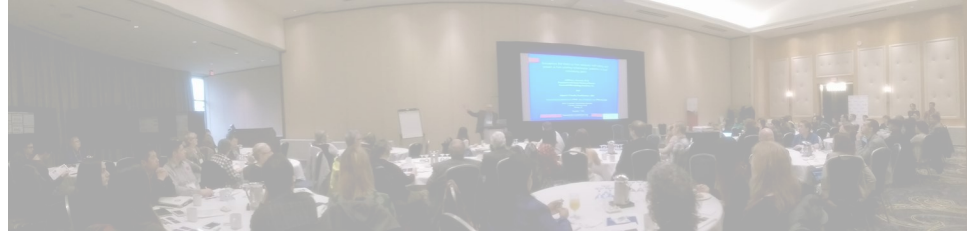
If you are interested in getting involved in our committees or events or if you have any topics of interest you would like us to pursue for our events, please contact me at president@bcfpa.net

We look forward to seeing you at our events this year!

*Sincerely,
Stephanie Nadya
President of BCFPA*



BC FOOD PROTECTION ASSOCIATION



2017 Spring Speaker's Evening: Sanitation and Biofilm Challenges in the Food Industry - A Chemical Company's Perspective

**Featured Speakers:
Brian March & Benoît Gagnon**

**Event generously sponsored by
Sani Marc**



SANI MARC

May 31 2017

Langara Clubhouse
6706 Alberta Street, Vancouver, BC

Complimentary Parking Available

Visit our website to register
and for more information
www.bcfoodprotection.ca

**Register by May 15 to
take advantage of our
early bird rate!**

- 5:00-5:30 PM Registration
- 5:30-6:15 PM Welcome Remarks & First Speaker: **Benoît Gagnon** on *Food Safety - A Chemical Company's Perspective*
- 6:15-6:45 PM Nutrition Break
- 6:45-7:30 PM Second Speaker: **Brian March** on *Biofilm in Food Production Environments*
- 7:30-7:45 PM Closing Remarks & Door Prizes

	Early Bird Rate (by May 15)	Regular Rate (after May 15)
BCFPA Member	\$40	\$50
Student/ Retired	\$20	\$30
Non-Member	\$65	\$75



BC FOOD PROTECTION ASSOCIATION

2017 Spring Speaker's Evening: Sanitation and Biofilm Challenges in the Food Industry - A Chemical Company's Perspective

May 31, 2017

Langara Clubhouse
6706 Alberta Street, Vancouver

FEATURED SPEAKERS



Benoît Gagnon

Technical Manager, Food & Beverage Division, Sani Marc

Graduated from Laval University, in Biochemistry (1991) and Food Science (1994), Benoît has gained food manufacturing experiences for several years, working for International Multifoods (Robin Hood flour mill), Kraft Foods (cheese plant) and Burns Philp (Fleischmann's baker's yeast). He then decided to get involved in the Sales aspect of our industry and joined General Mills (industrial baking mixes) in a Sales Technical supporting role. Then came the Sanitation world; he became a Technical Sales Manager for Sani Marc Inc. in 2004. During the first 10 years, Benoît has been in charge of managing a National agreement in the retail business sector (food preparation), until joining the Food and Beverage division 6 years ago, assuming a dual position. In his current role as a Technical Manager, he supersedes all technical aspects like new chemical development and introduction to market with Lab personnel, assessment and support of Customers (cleaning/sanitizing and micro related issues) as well as improving the Sanitation software (CEPS) of the F&B division. Benoît has now been with the Sani Marc Group for 12 years.

Benoît will present on: "Food Safety - A Chemical Company's Perspective".

Abstract: Chemical companies are often asked to assist with troubleshooting sanitation problems or contamination investigations. As a result, they gain broad experience and knowledge of the unusual places that issues can hide. This presentation will focus on real life examples of issues involving Listeria, allergens, dismantling of equipment and drains and cooling units in places you may not have considered.

FEATURED SPEAKERS



Brian March

Sales Director, Ontario & Western Canada for the Food & Beverage Division, Sani Marc

Brian started working in 1997s providing sanitation products and support services in the agriculture, dairy and seafood industries in Atlantic Canada, with a primary focus on high risk foods such as ready-to-eat crab, cooked-and-peeled shrimp and sushi products. Brian was involved developing and supporting sanitation programs that met or exceeded the quality standards of EU audit protocols (BRC, M&S, etc) as well as Far East sushi markets. Supporting these customers occasionally required investigating and resolving micro and biofilm issues, re-training sanitation personnel in troubled facilities and research and development trials for new applications of sanitizers and disinfectants. His current role is Sales Director, Ontario & Western Canada for the Food & Beverage Division of Sani Marc Inc. He supervises a team of seven specialists that support the sanitation and food safety programs in major food manufacturers across the country.

Brian will present on: “Biofilm in Food Production Environments”.

Abstract: Biofilms have been an industry buzzword for many years. However, recent developments in research on the science of biofilms has resulted in a greater understanding of how they form, their characteristics and effect of their presence. This presentation will focus on understanding the microbial challenges they present to food manufacturers and the impact on food safety. Recent advances in detection and eradication methods will also be discussed.

**This event has been generously sponsored by
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BCFPA



2016 Annual General Meeting - January 31, 2017 - Event Summary

The BCFPA 2016 AGM was successfully hosted on **January 31, 2017** at Shadbolt Centre for the Arts in Burnaby, BC. A total of thirty-five members attended this event, enjoyed two practical and informative presentations, and had a great opportunity to network. The event was opened by BCFPA president **Stephanie Nadya**. Stephanie chaired the Annual General Meeting by reviewing the 2016 annual report. The meeting minutes from the 2015 AGM was also accepted by the members.

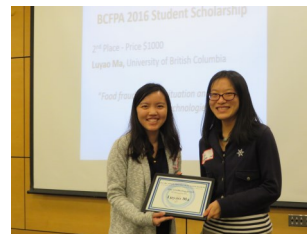


Upon the approval of the 2015 AGM meeting minutes by attendees, Stephanie introduced the first speaker of the night: **Yasmin Yorish**. Working as a food policy liaison officer

in Health Canada, Yasmin presented a talk on **“Nutrition Labelling – Healthy Eating Strategy”** in order to provide an overview of updates to nutrition labelling within the context of Health Canada’s Healthy Eating Strategy. According to Yasmin, several challenges are faced by Canadian people in promoting healthy eating patterns in Canada and Health Canada is playing a significant role in coping with these challenges. Updating the food labelling regulation including the nutrition information and ingredients list is one of the resolutions proposed by Health Canada. This presentation provided a thorough summary of these changes and equipped attendees with sufficient information to apply and adapt the new food labelling regulation.



A nutrition break following Yasmin’s presentation provided attendees with a delicious dinner and a good opportunity for networking. After the break, Stephanie announced the winners of the 2016 Student Scholarship. **Justin Falardeau**, a MSc food science candidate of the University of British Columbia, won first place for his essay on **“Metagenomics and the Future of Food Safety”**; and **Luyao Ma**, a MSc food science



candidate of the University of British Columbia, won the second place for her essay on **“Food Fraud: Current situation and advanced detection technologies”**.

The second presentation was given by **Karen Fong**, the winner of 2015 Student Scholarship. As a PhD food science candidate of the University of British Columbia, Karen presented the proposal of her PhD thesis project with some preliminary results. Her research topic and presentation is on **“Characterization of virulent bacteriophages for control of *Salmonella* in fresh produce”**. Traditional techniques including the usage of sanitizers and antimicrobials both have some disadvantages. In addition to the residues of these chemicals that pose health threats to consumers, the rapid resistance evolved from *Salmonella* resulted in reduced effectiveness of the treatments and potentially lead to more prevalent outbreaks of food-borne illnesses. Therefore, as a potential alternative method, bacteriophages are studied to treat *Salmonella* on fresh produce as a non-thermal processing technique. Attendees showed great interest in seeing the preliminary results of Karen’s research.



The evening finished with door prizes and a closing remark by Stephanie.

Prepared by Yaxi Hu, PhD Candidate in Food Science, UBC

2016 Scholarship Award First Place Essay Winner - Metagenomics and the Future of Food Safety

Metagenomics is the study of the function, diversity, and/or composition of microbial communities through sequencing of the collective genome (Riesenfeld et al. 2004). While it is not yet widely used in the food safety realm, advancements in next-generation sequencing and the introduction of third-generation sequencing suggest the potential for more widespread applications in the future. The objective of this essay is to demonstrate how metagenomics will eventually be a worthy addition to the food safety tool kit due to its ability to (i) detect and characterize pathogens within a food matrix, (ii) predict the presence of pathogens by observing changes in community structure, (iii) identify as yet unknown foodborne pathogens, and (iv) investigate native bacteria that may act as biocontrol agents within high-risk foods. While true metagenomic analysis refers to sequencing of all the DNA in a sample, it can also be used more loosely to describe community analysis through 16S or 18S rRNA sequencing (Stasiewicz et al. 2015). I will use the term metagenomics to refer to both methods.

The primary research of metagenomics in food safety has been to detect and characterize foodborne pathogens within a food matrix without the need for a pure isolate. A recent study used metagenomics to increase the detection of *Salmonella* in tomatoes; a fruit associated with several outbreaks despite the rarity of ever isolating the pathogen from the tomato phyllosphere (Ottesen et al. 2013). The researchers were able to detect the presence of *Salmonella* in samples despite them being found negative after enrichment by traditional methods. Interestingly, community analysis of the tomato matrix showed that the genus *Paenibacillus* co-enriched with, and can inhibit or kill *Salmonella*, suggesting a reason for the lack of detection of the pathogen post-enrichment. Another study used metagenomic sequencing to detect and characterize shiga-

toxin producing *Escherichia coli* (STEC) in spinach (Leonard et al. 2015). Post-enrichment, the STEC was detectable at concentrations as low as 0.1 CFU/g, and enough STEC reads were assembled to allow significant characterization through typing and virulence gene identification; all without requiring recovery of a pure STEC isolate.

Community analysis may also help to predict the risk for presence of foodborne pathogens. In the effort to find reliable indicator organisms for irrigation water safety, metagenomics provides a means to rapidly correlate pathogen occurrence with a vast number of microbes, but also with changes in the population structure. Indeed, a current project sponsored by the Center for Produce Safety is using 16S and 18S rRNA sequencing to investigate population changes in irrigation water which correlate with the presence of STEC and *Salmonella* (Bright & Ikner 2016). This concept may also be proven useful in the food processing sector. Computational biologists at IBM have teamed up with Mars Inc. to sponsor the Consortium for Sequencing the Food Supply Chain. This project will use metagenomics to catalog the typical genes that exist at any particular stage along the farm to farm continuum, both with and without pathogen contamination. If differences can be perceived, risk can be monitored throughout production rather than through individual random sampling (Weeks & Institute of Food Technologists 2016).

Metagenomics also provides the potential to discover previously unknown foodborne pathogens as this method allows researchers to observe the presence of microbes not culturable by traditional means, which are estimated to make up more than 99% of naturally occurring microorganisms in the environment (Streit & Schmitz 2004). This is of interest as an estimated 60% of foodborne illnesses in Canada are the result of

unspecified agents (Thomas et al. 2013), and at least a portion of those may be due to as yet unknown causative agents. For an example, through metagenomic sequencing, researchers in Japan were able to discover that a group of foodborne illnesses associated with eating raw fish were the result of a recently discovered parasite, *Kudoa spetempunctata*, which had previously not been known to be pathogenic to humans (Kawai et al. 2012).

Lastly, metagenomics can be used to investigate the biocontrol potential of native food microbial populations. Despite previous work on this front in other fields, such as how the survival of *Listeria monocytogenes* in soil is inhibited through increased biodiversity (Vivant et al. 2013), only limited work has been done within the food environment. One study found that while the native microflora of spinach can increase the ability of STEC to attach and form a biofilm on stainless steel surfaces, in the long run, these bacteria actually inhibit the STEC survival by increasing competition for nutrients (Carter et al. 2012). Additionally, as discussed above, increasing concentration of *Paenibacillus* spp. can inhibit *Salmonella* during enrichments of tomato samples (Ottesen et al. 2013). In an effort to further advance this field of research, I have proposed a project for my PhD to investigating the antilisterial effects of the native microbiota found within soft-ripened cheeses. These cheeses are a higher risk for foodborne pathogens due to their higher moisture and lower acidity compared to their harder cousins, and have been the cause of two listeriosis outbreaks in British Columbia (McIntyre et al. 2015). Through metagenomic sequencing, I intend to probe the microbial communities of these cheeses to discover particular strains and/or genes which can provide added protection against contamination with *L. monocytogenes*. These findings may help the cheese industry to provide increased protection against pathogen contamination.

Metagenomics within food matrices is still in its infancy, and certain limitations still exist, such as the detection of DNA of dead organisms, which can result in false positives (Stasiewicz et al. 2015). Despite these limitations, I believe that metagenomics demonstrates great potential for food safety as continuing advancements will eventually make it affordable for routine use. Now is the time to begin thinking about how we can most effectively take advantage of this technology for when that time comes.

[References available upon request]

Written by: Justin Falardeau



Justin Falardeau received his BSc in Food Science at Carleton University in 2014. He spent his undergraduate studying antifungal lipopeptides produced by particular strains of the bacterium *Bacillus subtilis*. His current research involves monitoring the occurrence of VTEC, *Salmonella* & *Listeria monocytogenes* in the irrigation water of produce farms around the Lower Mainland of British Columbia. Justin is a recipient of NSERC CGS-M scholarship. He is also a BCFPA student member and one of the 2016 IAFP Student Travel Scholarship Recipients.

Follow us on LinkedIn, Twitter and Facebook!

Did you know we have a [LinkedIn](#), [Twitter](#) and [Facebook](#) page? You can follow us and be the first to know about the latest food safety news, postings and announcements!

Upcoming Events

Do you know of an event or holding one of interest to our members? Then please submit details of the event(s) to newsletter@bcfpa.net for inclusion in the next newsletter.

May 8-11, 2017 **Food Safety Summit**
www.foodsafetysummit.com

May 24-25, 2017 **International Nonthermal Processing Workshop** www.eventbrite.com/e/2017-ift-effost-international-nonthermal-processing-workshop-registration-31269929200

May 31, 2017 **BCFPA Spring Speaker's Evening**
<http://www.bcfoodprotection.ca/event-2538000>

June 25-28, 2017 **IFT Annual Conference** www.ift.org

July 9-12, 2017 **International Association for Food Protection Annual General Meeting**
<https://www.foodprotection.org/annualmeeting/>

July 13-14, 2017 **FSPCA Annual Conference**
fspca-annual-conference.eventbrite.com

Sep 19-22, 2017 **Process Expo**
www.myprocessexpo.com



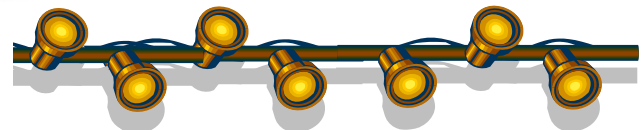
Save time later by registering now to attend IAFP 2017! This year's meeting will be held July 9–12 at the Tampa Convention Center in Tampa, Florida. Housing is going quickly, so book your hotel room NOW at our group rate to avoid anticipated sell-outs! For more information, including registration and housing, go [here](#)

Spotlight on the Web

Websites have become great resource tools and are the library of choice for many of us. If you have a favourite link that you find helpful in your line of work, please share it with us: newsletter@bcfpa.net

This issue will contain 3 article links.

Food Recall System Effectiveness: Industry and Government Perspectives within Canada
<https://www.foodprotection.org/publications/food-protection-trends/archive/2017-05-food-recall-system-effectiveness-industry-and-government-perspectives-within-canada/>



Food Safety Knowledge and Attitudes: Investigating the Potential Benefits of On-site Food Safety Training for Folklorama, a Temporary Food Service Event
http://www.ciphi.on.ca/images/stories/conf12/presentations/investigating_the_potential_benefits_of_food_safety_training.pdf

IAFP Affiliate View- Spring 2017
<https://www.foodprotection.org/upl/downloads/publications/affiliates-view/spring%202017.pdf>

Calling All Volunteers!



The BCFPA is always looking for enthusiastic individuals to join our BCFPA Executive Board or Committees. Have you considered becoming more involved with the BCFPA? Get involved and serve on a Committee!

We are looking for volunteers to provide a small but valuable portion of their time to work on special Committees or even become a part of the Executive. If you are interested, please contact any of our Executives who will be more than happy to answer your questions!

BCFPA Executive and Committee Members

President: Stephanie Nadya
E: president@bcfpa.net

Vice President: Justin Falardeau
E: vicepresident@bcfpa.net

Treasurer: Peter Taylor
E: treasurer@bcfpa.net

Secretary: Yaxi Hu
E: secretary@bcfpa.net

Membership: Simon Cowell (Regular Members); Peter Taylor (Sustaining Members)
E: members@bcfpa.net

Communications Committee: Stephanie Chiu
E: publicrelationscommittee@bcfpa.net

By-Law & Resolutions Committee: vacant

Past President: N/A
E: pastpresident@bcfpa.net

Program and Special Events: Simon Cowell & Neda Rahimi
E: events@bcfpa.net

Awards & Scholarships Committee: Justin Falardeau
E: vicepresident@bcfpa.net

IAFP Affiliate Council Delegate: Siyun Wang
E: affiliatecouncildelegate@bcfpa.net

SPDG Coordinator: Yaxi Hu
E: studentgroup@bcfpa.net

Newsletter Editor: Stephanie Chiu
E: newsletter@bcfpa.net

Webmasters: Peter Taylor, Stephanie Chiu
E: treasurer@bcfpa.net



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To learn more about the IAFP, go to: www.foodprotection.org



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- Sustaining Member - Silver Level: \$250
- Sustaining Member - Gold Level: \$500

For More Information

President, BCFPA
E: president@bcfpa.net

To Renew

E: treasurer@bcfpa.net

Biofilms - What You Need To Know - By Sani Marc

No, we're not talking about biographical films depicting the life and times of famous individuals. We're referring to a community of microorganisms that typically forms a thin, slimy layer on a given surface.

Role and implications of biofilms

Biofilms protect bacteria, enabling them to survive under adverse environmental conditions. Biofilm bacteria can withstand host immune responses and are highly resistant to antibiotics and disinfectants. The presence of biofilms during infections means that prevention, diagnosis and treatment have to be approached differently.

This natural method by which bacteria adhere to surfaces greatly changes the way in which they can be disinfected, which is why recurrent contaminations of some surfaces have to be managed carefully.

How microorganisms survive

In nature, microorganisms go "with the flow." They go wherever the fluid surrounding them goes. When they encounter a surface, however, they can sometimes get stuck to it – at which point they will focus their energy elsewhere. This reaction will depend on their environment. If nutrients abound, the microorganisms will grow and multiply. If nutrients are beginning to run out, the microorganisms will form a cocoon to protect themselves and will build a viable community. This cocoon, called an "extracellular polymeric matrix," is the main difference between planktonic bacteria and a biofilm.

4 protective mechanisms

This difference may seem insignificant, but it has huge implications for the microorganisms and for how surfaces containing a biofilm may be disinfected. That's because the microorganisms contained inside a biofilm are protected from the environment. The following four protective mechanisms are widely accepted:

1. The matrix forms a physical barrier that blocks hazardous agents from reaching the microorganisms.
2. The close proximity of the bacteria in the biofilm

makes it easier for them to communicate with one another to cope with stress.

3. Metabolic activity is reduced, which in turn may reduce the bacteria's susceptibility to antimicrobial agents.

4. The surviving (persister) cells accumulate in the biofilm, since they revert less readily and are physically retained by the biofilm matrix.

These four protective mechanisms increase the bacteria's resistance to the most widely used disinfectants. This creates a false sense of security, which increases the risk of infection.

What products work against biofilms?

When manufacturers seek approval for the efficacy claims of a disinfectant, they must show that the results have been obtained through a variety of methods. Although these methods test the rate at which planktonic bacteria are destroyed, they do not take into account the bacteria that are hiding inside the biofilm. What's more, microorganisms that are unable to form a biofilm on their own (such as viruses) can hide inside an existing biofilm, which increases their protection. In other words, even if a product demonstrates excellent results for eliminating bacteria, it does not necessarily mean it will be effective against biofilms.

Attack the root problem behind biofilms

Various strategies have been devised to attack biofilms, but to halt biofilm contamination, both the surface of the biofilm and the microorganisms inside it must be destroyed. If you kill the bacteria but leave the biofilm in place, you could create a new home for other bacteria, which will quickly form another biofilm. On the other hand, if you eliminate the biofilm without killing the bacteria, they can spread everywhere.

More strategies for fighting biofilm: www.sanimarc.com/biofilm



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- RJW Consulting Canada
- Silliker JR Laboratories
- Small Scale Food Processor Association