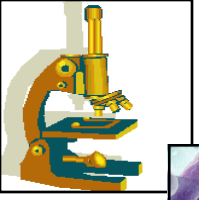
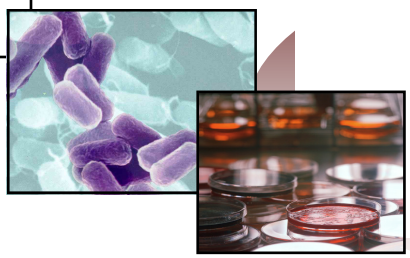




IBASM NEWSLETTER

Volume 15, Issue 2
February, 2013

Greetings from the President: Becky Sparks-Thissen

I hope everyone is excited to start getting ready for our annual Spring IBASM meeting. This year's meeting will be held at McCormick's Creek State Park at the Canyon Inn April 12-13. In this edition of the newsletter, you will find all the information you need to prepare for and register for what should be another great meeting.

We will have ample opportunities for student presenters to present poster and oral presentations. This is a great opportunity to present your latest research to your colleagues. Oral presentations are highly encouraged. In addition, we are privileged to have Dr. Tom Schwan from the NIH as our branch speaker and David Hooper, ASM president joining us. It promises to be two days of good science and conversation!

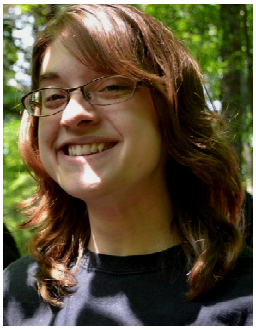
We encourage you to register and reserve accommodations early. You will find all the needed information on the registration form in this edition of the newsletter. Accommodations can be reserved at www.indianainns.com or by calling 1-877-922-6966. Our group code is 0412MB**. Note that you must make your reservations by March 12!** There are 2 other conferences at the Inn that weekend and the Inn will likely fill up fast! If you want to eat your meals at the Inn, I will need to have your meal reservations and payment by April 1.

McCormick's Creek State Park has lots of hiking and nature trails for you to explore (http://www.in.gov/dnr/parklake/2978.htm).

I look forward to seeing you all in April. Please do not hesitate to contact me if you have any questions (rlsparksth@usi.edu).

In this issue:

Message from Undergraduate Student Representative - Breanna Brenneman



Hello, members! I hope all is going well for you this spring semester. Now is the time to focus on the future! The IBASM Spring Meeting is fast approaching. If you wish to participate in the meeting, begin thinking about your project and posters now before the deadline for abstracts arrives in March. Even if you do not have results yet, you can begin writing your introduction and methods sections. It is no fun trying to throw together a poster or presentation for IBASM when other class deadlines are looming!

While on the subject of deadlines, summer internship programs usually stop accepting applications in February or March. A summer internship position is a great way for students to improve their research skills, gain experience, and possibly publish in a peer-reviewed journal. In addition, many of these internships are paid! At my NSF sponsored Research Experience for Undergraduates (REU) at Western Kentucky University, I earned several thousand dollars and have a publication in progress with my mentor, Dr. Ajay Srivastava. Aside from the fiscal and professional benefits, working at this REU has solidified my passion for scientific research and encouraged me to be relentless in my pursuit of knowledge. Do not let these awesome opportunities pass you by. If you need assistance in applying or finding internships, please contact me!

In preparation for the IBASM Spring Meeting, Sarah Griffith, M.S. student representative, and Ruijie Huang, Ph.D. student representative, are contacting universities in Indiana to expand our attendance this year. These universities include Rose-Hulman, Valparaiso, Earlham, Depauw, Norte Dame, and many more. As president of the Ball State chapter of ASM, I have been spreading the word to our members. In fact, one of our chapter meetings has been allotted for student presenters to practice their talk in front of an audience. You can help spread the word at your institution, too! Word-of-mouth can be the best way to advertise. I hope to see lots of new faces this year!

Please feel free to contact me at brbrenneman@bsu.edu if you have any questions or suggestions.

Message from Graduate Student Representative - Sarah Griffith

Hello, my name is Sarah Griffith, and I am a graduate student representative for the IBASM. I am currently a Master's student at Purdue University (West Lafayette campus), and my research investigates the effects of light on the metabolism of cyanobacteria. I became interested in microbiology as an undergraduate student at Purdue University, which is where I obtained my B.S. in Microbiology. I am very excited to be a student representative, and I have many goals for the annual spring meeting. One of my goals is to increase attendance at the spring meeting by encouraging more universities to attend the IBASM annual meeting, as it is important to know what research is occurring in the state of Indiana. I will also urge companies in Indiana that perform research related to microbiology, or that have microbiology divisions to attend as this can create collaborations between faculty, students and industry. In addition to collaborations, it has the potential to be a good networking event for students for future career opportunities and internships.

The IBASM is an organization that strives to foster the professional development of undergraduate and graduate students, and provides the invaluable experience of allowing them to present their research at the annual spring meeting in the form of a poster or an oral presentation. I encourage everyone to participate, as this will allow you to develop better presentation skills, as well as receive feedback from other microbiologists that will help further your research. I am very passionate about microbiology and look forward to the upcoming year, working with the executive committee and representing the students. If you have any suggestions or questions, please contact me at griffits@purdue.edu.

From the Desk of Jim Mitchell-...Educational Representative

Student Poster Competition

Abstract submission form will be distributed by email separately and is also located at IBASM website: http://ibasm.iweb.bsu.edu/. We will be utilizing 4x4 sq.ft. tri-fold styrofoam poster boards and each student is limited to one board. Tacks will be supplied but it wouldn't hurt to bring some extras in case we run short. You may participate in both oral (limited # of slots available) and poster sessions but you will only be judged for an award in the poster session. Oral presentations are informal and an excellent venue to gain lecture experience with a small audience. Awards will be presented in the following divisions: Undergraduate, MS graduate and Ph.D. graduate. Post-Doctoral Fellows are welcome to participate in either session but are not eligible for the award competition.

Students will be judged in 5 categories:

***Professional Appearance*:** Jeans and sweat pants are unacceptable; torn, dirty, or frayed clothing is unacceptable. Business casual dress is the standard dress code. (20 points)

***Scientific Thought*:** Is there a clear hypothesis? Are the goals of the study defined? Were data correctly analyzed? Were statistical analyses performed? Did a logical conclusion result? (20 points)

***Creativity*:** Was the topic original? Is there anything new in the approach to answering the question? Were new methods developed? (20 points)

***Thoroughness*:** Was the study as complete as possible? Does the student understand the background material? Were subject headings (e.g. Introduction, Materials & Methods, etc.) presented? Is the student aware of the drawbacks of the study? (20 points)

***Presentation (poster)*:** Were the results/conclusions clearly presented? Was the student's verbal expression clear and concise? Was the student able to answer questions? How well did the poster convey the information? (20 points)

2013 IBASM Spring Meeting

Tentative Agenda

McCormick's Creek State Park

Canyon Inn, Sycamore Room

Friday April 12, 2013

5:00-7:00 PM	Registration
6:00-7:00 PM	Dinner
7:00-8:00 PM	**ASM Branch Lecture**- Tom Schwan, Rocky Mountain Laboratory, NIH
8:00-10:00 PM	Welcome reception

Saturday April 13, 2013

7:30-8:30 AM	Breakfast
8:30-10:00 AM	Poster Judging
10:00-11:30 AM	Poster Viewing
10:30-11:30 AM	Student Oral Presentations and/or Award Winner Presentation
11:30-12:30 PM	IBASM Business Meeting
12:30-1:30 PM	Lunch
1:30-2:30 PM	Student Oral Presentations
2:30-3:30 PM	Presentation by David Hooper, Chief of the Infection Control Unit and Associate Chief and Fellowship Program Director, Division of Infectious Diseases, Massachusetts General Hospital, ASM president
3:30-4:00 PM	Announcement of Student Award Winners and Closing Remarks

ABSTRACT FORM FOR THE 2013 IBASM ANNUAL MEETING

Complete all appropriate boxes of this form and email by **March 11th** to: jkmitchell@bsu.edu (Dr. Jim Mitchell). Abstracts should be prepared according to the National ASM guidelines. All abstracts should include the title, authors, and institutional address. Abstracts will be published in the meeting program if submitted by deadline. Limited funding will be available to subsidize lodging and food for student presenters (see registration form). Abstract Form also located at http://ibasm.iweb.bsu.edu/

Name and mailing address of presenting author:

Name **Phone**
Address **Fax**
E-mail

Subject Category
(i.e. pathogenesis, DNA viruses, etc.)

Are you a student presenter? ☐ Yes or ☐ No (check one)

☐ Oral and/or ☐ Poster presentation (check appropriate boxes)

If you are not selected for an oral presentation, are you willing to present a poster? ☐ Yes ☐ No ☐ Does not apply

Check if presenting author is a student competing for:
☐ Undergraduate ☐ M.S. Graduate ☐ or Ph.D. Graduate Student Award (a short paper is required from award winners).
If competing for an award student must present a poster. (If left blank student will not be judged in competition).

Check if presenting student will also be presenting at the 2012 ASM General Meeting: ☐
Are you competing for the national travel award to the 2012 ASM General Meeting? : ☐ Yes ☐ No

ABSTRACT

IBASM Annual Meeting Registration and Meal Reservation Form

April 12 and 13, 2013
McCormick's Creek State Park, Spencer IN

Please use this form to register for the IBASM meeting and reserve your room and meals. The meeting registration fee is $25 for regular members and $5 for student members. **You must be an IBASM member to participate in the meeting.** Family members are encouraged to attend, however, they do not have to pay registration fees. Upon completion, **e-mail** this form to Becky Sparks-Thissen (rlsparksth@usi.edu) no later than March 12, 2013. If necessary, forms may also be mailed to Becky Sparks-Thissen at the address given at the end of the form. **Registrations received after March 17h will be subject to a $7.00 late fee (regular members) or a $4.00 fee (student members).** Please feel free to contact Becky at the email address provided above if you have any questions.

Please fill in the requested information.

Name:_____ **#Adults** _____ **#Children**_____

Address:_____

Phone:_____ **Fax:**_____ **Email:**_____

IBASM member: ___Yes ___No If you are not a member, you will need to become a member and include your dues with your payment for the meeting.

Please indicate which sessions you plan to attend:

___ Friday evening session
___ Saturday morning session
___ Saturday afternoon session

If you are a student presenter, do you request travel assistance?

___ Yes
___ No

Lodging

A block of rooms have been reserved at the Canyon Inn at McCormick's Creek State Park. You should contact them directly at 1**-877-563-4371 or www.indianainns.com** and reference **group code 0412MB** to make your reservation. Note that payment is due at the time of your reservation. **You must make your reservation by 4/12/13**. The rooms will be released on 4/12/13 and we will not be able to guarantee you a room.

Payment

Registration

Member ($25)	$_____
Student ($5)	$_____

Dues (if applicable)

Non-student ($15)	$_____
Student ($5)	$_____

Meals:

Dinner ($16.11)	$_____
Breakfast ($11.15)	$_____
Lunch ($11.15)	$_____

Late fees (if applicable) $_____

Total Enclosed $_____

A check payable to "Indiana Branch ASM" for the total costs of registration, dues (if applicable), and meals must be sent by mail by **March 18, 2013** to: Becky Sparks-Thissen, Biology Department, University of Southern Indiana, 8600 University Blvd, Evansville, IN 47712.

Please Note:

Abstracts for the Annual IBASM Meeting are due by March 11, 2013

2013 Membership Application/Renewal

If you have not done it already, it is time to pay your IBASM dues for 2013. You can do it either online when you pay your dues to the ASM National Organization (www.asm.org) or by using this form. Dues are $15.00 for non-students and $5.00 for students (per year). Please return the completed form with check, payable to IBASM, to

Dr. Christian Chauret
School of Sciences
Indiana University Kokomo
2300 South Washington Street
Kokomo, IN 46904-9002
Phone: (765) 455-9371; email: cchauret@iuk.edu

Please check:
_____ New Member Application
_____ Renewal for 2013

and
_____ Student Member in 2013 ($5)
_____ Full Member in 2013 ($15)

Name:

Current Position & Title:

Institution:

Mailing Address (new address Yes / No?) :

Phone:
Email:
Fax:
National ASM Member #::

Background

Highest Degree:
Institution:
Professional Interests:

Second Place Undergraduate Winner

Pathogen Contamination of Rentable Forms of Licensed Entertainment

Nicholas Gallina, Zachary Turner and H. Kathleen Dannelly
Department of Biology, Indiana State University, Terre Haute, IN

Introduction

Transmission of disease occurs in various ways by direct and indirect contact between an infected and uninfected individual. Certain human pathogens lend themselves well to transmission via inanimate objects or fomites. Fomites could be personal items such as drinking glasses, eating utensils, toothbrush or contact lenses. Fomites can also be publicly used items such as door knobs, toilet seats, and paper or coin currency. We suspected that a potential source for human pathogen transmission would be rentable DVDs because they are passed from person to person in a relatively short period of time (Madigan). The intention of this study was to obtain DVDs from various sites, then isolate and identify potentially pathogenic Gram positive and Gram negative bacteria from the cases and disks.

Preliminary Results

An earlier study in this laboratory showed the presence of methicillin resistant *Staphylococcus aureus* (CA-MRSA) on touch screens such as those found on Redbox rental stations. The locations of the touch screens varied between indoor and outdoor rental stations. This study was limited to screening for *Staphylococcus aureus* and CA-MRSA but demonstrated the potential for transmission of serious pathogens on these publically used fomites.

Materials & Methods

Twenty seven DVDs were tested from Redbox rental stations located in Terre Haute, Indiana and fifteen DVDs were tested from the Indiana State University (ISU) Library. Sterile cotton-tipped applicators saturated in sterile distilled water were used to swab the outside of the case, the inside of the case, and the disk. Each sample was plated onto Levine Eosin Methylene Blue (EMB) (Becton Dickson, Sparks, MD), Mannitol Salt Agar (MSA) (Dot Scientific,Burton, MI), and sheep blood agar plates (BAP). Tryptic Soy Agar (TSA) (Dot Scientific, Burton, MI) was used for subculturing isolates. Once inoculated, plates were incubated at 37^0C for 18-24 hrs. The BAP plates were incubated under the same temperature conditions but in a candle jar (Madigan).

Once incubated, plates were examined for various fermentation reactions and hemolytic activity. Before any secondary identification measures took place, isolates were Gram stained and subcultured (Madigan).

MSA plates were examined for *Staphylococcus* sp. isolates and BAP plates were examined for typical *Staphylococcus* colony types especially with hemolysis. Possible positive *Staphylococcus* colonies were inoculated into rabbit plasma and tested for coagulase production (see below). Coagulase positive *Staphylococcus aureus* from the MSA plates were further tested by subculturing and placing an oxacillin disk (1 µg) on the plate to determine susceptibility (Leboffe).

The coagulase test was performed by inoculating reconstituted rabbit plasma with the culture, and incubating at 37^oC for 30 min. Samples that were negative at 30 min were re-incubated for 3.5 hrs at 37^oC and re-examined for clumping of the plasma.

Gram negative isolates were identified using API test strips (Biomerieux, France). After incubation and analysis of the test strip according to manufacturer's guidelines, an online database was consulted for the final identification (Leboffe).

Results

Four CA-MRSA strains were isolated from ISU library DVDs and no CA-MRSA were isolated from the Redbox DVDs. For two of the four isolates, numerous colonies of CA-MRSA grew on both the MSA and BAP plates from the source. On BAP these colonies could be distinguished by their β-hemolysis. (Leboffe) The locations of CA-MRSA contamination occurred on the outside of the case and the disk.

The Gram negative organisms were only isolated from Redbox DVDs. The Gram negative isolates were only found on the inside case of the DVDs. The isolates were as follows: *Pasteurella pneumotropica, Stenotrophomonas maltophilia, Vibrio fluvialis, Erwinia* spp, and *Enterobacter cloacae*.

Discussion

Gram positive organisms, because they lack the outer membrane, live longer on inanimate objects therefore it is not overly surprising to find *Staphylococcus* sp. surviving in a dry state on the surface of DVDs and cases.(Madigan) Though disconcerting, the reality of finding CA-MRSA on public rentable media is also not surprising since it is basically just a *Staphylococcus aureus*. However, the implications for the spread of this disease causing organism are tremendous. The fact is that even if we had not found CA-MRSA, the fact that we isolated *Staphylococcus aureus* indicates that the spread of CA-MRSA by this route is possible.

All of Gram negative bacilli isolated from the DVDs are potential human pathogens. However, because *Pasteurella, Stentrophomonas*, and *Erwinia* can be found in the environment it is not possible to determine that these were placed on the DVDs by human touch. It could be argued that they are merely environmental contaminants and in low numbers will likely be harmless to the handler (Charles River, Cunha, Merriam-Webster).

Enterobacter cloacae is a member of the Enterobacteriaceae. It can cause opportunistic infections but more importantly in our study, it indicates fecal contamination by a warm blooded animal. And the *Vibrio fluvialis* is the most telling of all. This is a salt water organism that causes food poisoning. Where you would find this organism in the Mid-West would most likely be contaminated seafood or on the hands of a person who has handled that seafood or experience the food poisoning (Fraser).

The importance of *E. cloacae, P. pneumotropica, S. maltophilia*, and *V. fluvialis* is that these organisms are opportunistic for the immunocompromised patient. Erwinia spp. is commonly described as a plant pathogen, but has been linked as a coliform. The presence of *Enterobacter cloacae* and *Vibrio fluvialis* on Redbox DVDs shows that our hypothesis is correct for Gram negatives, as well as, Gram positive organisms; rentable licensed media is a valid means of transmittance of pathogenic organisms from one person to another (Charles River, Cunha, Merriam-Webster, Fraser).

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Second Place Graduate (Ph.D. Division) Winner

Effect of Nicotine on Growth and Metabolism of *Streptococcus mutans*

R. Huang, M. Li, and R.L. Gregory
Indiana University School of Dentistry, Indianapolis, IN

Introduction

Dental caries is a chronic bacterial infection disease, which is one of the world's major diseases presenting in 60-90% of the school children population and most of the adult population. Under normal physical conditions, the surfaces of tooth hard tissues (enamel, dentin and cementum) demineralize and remineralize all the time. If demineralization exceeds remineralization, the tooth hard tissues will lose minerals and break down, causing caries. ***Streptococcus mutans*** is the chief pathogen for caries by producing lactic acid and dissolving tooth tissue minerals (4). *S. mutans* is a facultatively anaerobic, Gram-positive coccus-shaped bacterium. It is not a caries-specific bacterium and presents in both caries and caries-free populations. *S. mutans* has a very strong ability to metabolize sucrose to lactic acid, causing pH drop and obstructing remineralization of the tooth tissues (3). **Nicotine** is an alkaloid present in tobacco, accounting for about 0.6-3.0% of the dry tobacco weight. Tobacco use is strongly associated with periodontal diseases, but its association with caries is little investigated. Some research has revealed a positive relationship between **smoking and caries**. Higher decayed/missing/filled teeth (DMFT) scores of permanent teeth were detected in a Swedish smoking population than a non-smoking population (1). In addition, in the U.S. chewing tobacco was associated with root surface caries in a dose-dependent manner (5). The **specific aim** of this study is to assess the effect of nicotine on *S. mutans* growth and metabolism. Our **hypothesis** is nicotine will promote the growth and metabolism of *S. mutans*.

Materials & Methods

The **methods** we used to accomplish the goal were the minimal inhibition concentration (MIC), minimal bactericidal concentration (MBC), and minimal biofilm inhibition concentration (MBIC) tests of nicotine on seven different *S. mutans* strains (UA159, UA130, 10449, OMZ175, LM7, NG8, A32-2). Based on the MIC/MBC/MBIC results, we investigated the planktonic growth by a turbidity absorbance reading method, biofilm formation by a crystal violet stain method, and metabolism by an XTT test (2).

Results & Discussion

Our **data** indicate that the **MIC, MBC and MBIC** were 16 mg/ml (0.1 M), 32 mg/ml (0.2 M), and 16 mg/ml (0.1 M), respectively, for most of the *S. mutans* strains. The only exception was the MBIC of 10449 and OMZ175 was 8 mg/ml (0.05 M). The **planktonic growth** of UA159 and UA130 was not significantly affected by nicotine, the growth of 10449, NG8, A32-2, LM7, and OMZ175 was repressed by 2.0-8.0 mg/ml nicotine, and the growth of A32-2 was significantly upregulated by 0.25 and 0.5 mg/ml nicotine (Fig. 1.). *S. mutans* **biofilm formation** was increased in a nicotine-dependent manner, although the increase still varied from one strain to another (Fig. 2.). Generally, lower nicotine concentrations stimulated biofilm formation, while higher nicotine concentrations inhibited biofilm formation. *S. mutans* UA159, UA130, 10449, A32-2, LM7, and OMZ175 had increased biofilm mass in some nicotine concentrations between 0.5 to 4 mg/ml. At 8.0 mg/ml of nicotine, biofilm formation was increased in UA159, A32-2, and NG8 cultures, while decreased in 10449. The nicotine concentrations inducing maximum biofilm formation were 4.0-8.0 mg/ml, except strain LM7 (1.0 mg/ml).

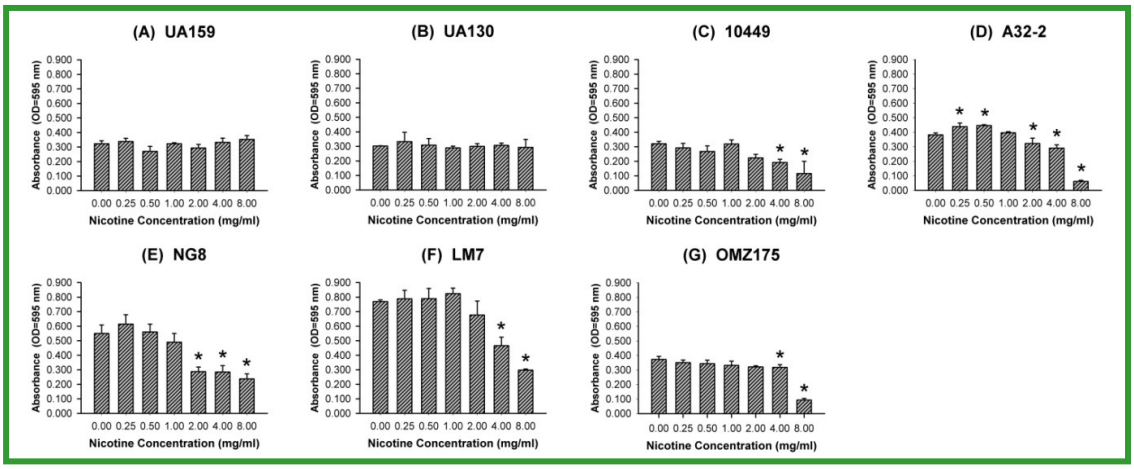

Fig. 1. Planktonic culture growth of seven strains of *S. mutans* after 24 h.

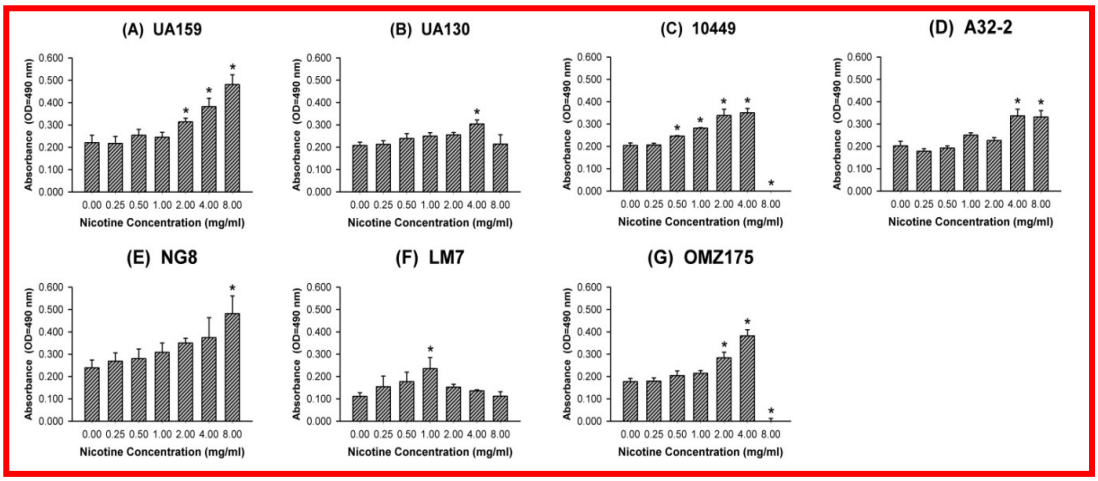

Fig. 2. Biofilm formation of seven strains of *S. mutans* after 24 h.

The **overall biofilm metabolic activity** of all seven *S. mutans* strains significantly increased in a nicotine dose dependent manner (Fig. 3.). The **metabolism relative to biofilm mass (MRBM)** of most strains (UA130, 10449, NG8 and OMZ175) was increased in a nicotine dose dependent manner up to 8.0 mg/ml and in others (UA159 and A32-2) up to 16.0 mg/ml (Fig. 4.). In **conclusion**, nicotine enhanced biofilm formation and biofilm metabolism of *S. mutans*, and, therefore, nicotine may be one of the contributors of caries development in smokers.

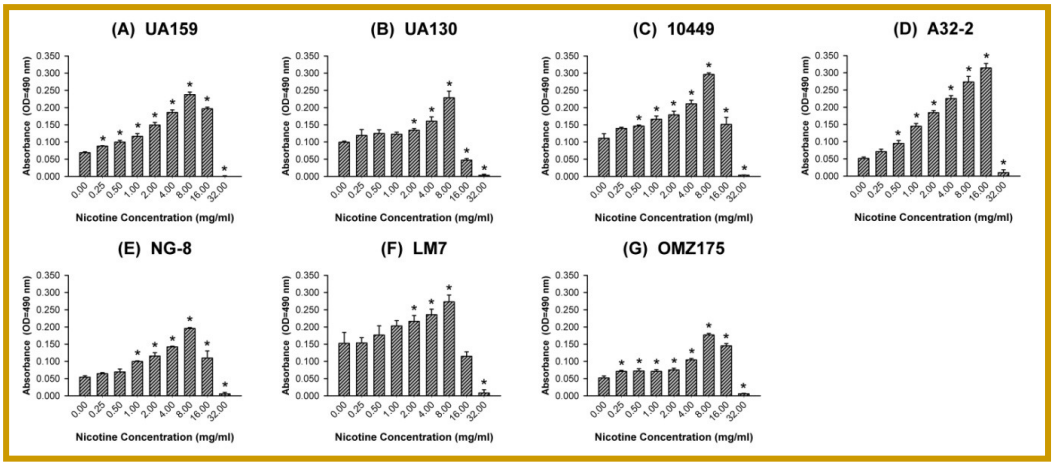

Fig. 3. Biofilm metabolic activity of seven strains of *S. mutans*.

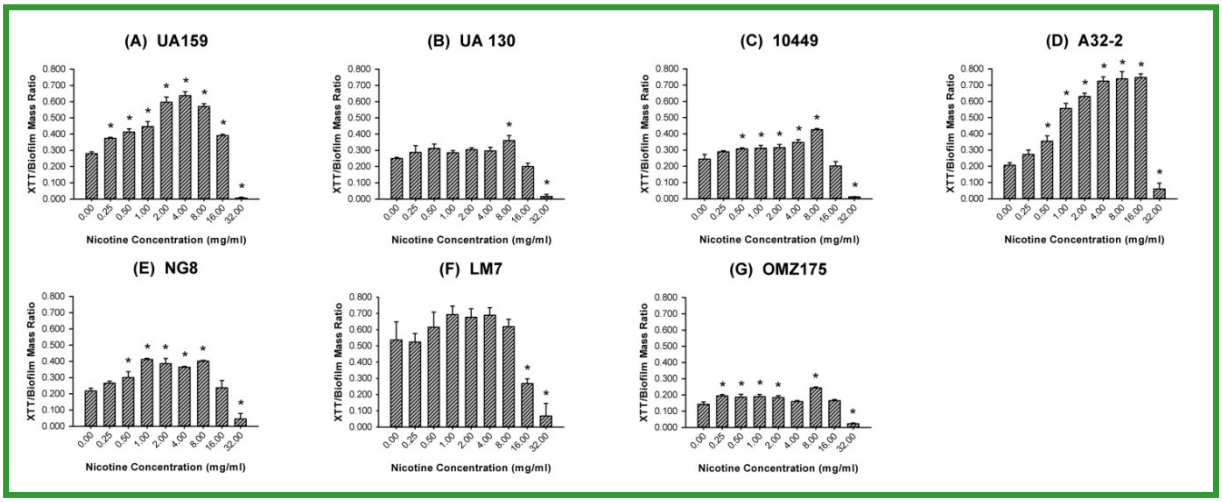

Fig.4. Metabolism relative to biofilm mass (MRBM) of seven strains of *S. mutans*.

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Nicholas Gallina receiving his award from IBASM's Education Representative **Dr. Jim Mitchell**

Ruijie Huang receiving her award from IBASM's Education Representative **Dr. Jim Mitchell**

Are Bacteria Making You Hungry?

Over the last half decade, it has become increasingly clear that the normal gastrointestinal (GI) bacteria play a variety of very important roles in the biology of human and animals. Now Vic Norris of the University of Rouen, France, and coauthors propose yet another role for GI bacteria: that they exert some control over their hosts' appetites. This hypothesis is based in large part on observations of the number of roles bacteria are already known to play in host biology, as well as their relationship to the host system. "Bacteria both recognize and synthesize neuroendocrine hormones," Norris et al. write. "This has led to the hypothesis that microbes within the gut comprise a community that forms a microbial organ interfacing with the mammalian nervous system that innervates the gastrointestinal tract." (That nervous system innervating the GI tract is called the "enteric nervous system." It contains roughly half a billion neurons, compared with 85 billion neurons in the central nervous system.)

"The gut microbiota respond both to both the nutrients consumed by their hosts and to the state of their hosts as signaled by various hormones," write Norris et al. That communication presumably goes both ways: they also generate compounds that are used for signaling within the human system, "including neurotransmitters such as GABA, amino acids such as tyrosine and tryptophan—which can be converted into the mood-determining molecules, dopamine and serotonin"—and much else, says Norris.

Furthermore, it is becoming increasingly clear that gut bacteria may play a role in diseases such as cancer, metabolic syndrome, and thyroid disease, through their influence on host signaling pathways. They may even influence mood disorders, according to recent, pioneering studies, via actions on dopamine and peptides involved in appetite. The gut bacterium, Campilobacter jejuni, has been implicated in the induction of anxiety in mice, says Norris.

But do the gut flora in fact use their abilities to influence choice of food? The investigators propose a variety of experiments that could help answer this question, including epidemiological studies, and "experiments correlating the presence of particular bacterial metabolites with images of the activity of regions of the brain associated with appetite and pleasure."

(V. Norris, F. Molina, and A.T. Gewirtz, 2012. Hypothesis: bacteria control host appetites. J. Bacteriol. Online ahead of print 9 November 2012.)

Mouse Menopause Model Sheds Light On UTIs In Post-Menopausal Women

Researchers from Washington University School of Medicine, St. Louis, show that reservoirs of uropathogenic *E. coli* within the bladder exist in higher numbers post-menopause than pre-menopause in a mouse model, a finding that could help explain the greater prevalence of urinary tract infections in post-menopausal women. They also found that estrogen supplementation reduced the numbers of such reservoirs dramatically.

Urinary tract infections (UTIs) afflict an estimated 13 million American women annually. Post-menopausal women are especially vulnerable to UTIs. The high incidence of UTIs in post-menopausal women has long been thought related to the menopausal fall in estrogen levels.

However, "estrogen therapy to help limit or prevent recurrent or chronic UTIs has not been consistently shown to be effective in reducing the burden of infections in this population," says Indira Mysorekar, a researcher on the study. "Given the increasing incidence of multidrug resistant bugs and the high incidence of UTIs in older women, it is vital that we fully understand the dynamics of estrogen interaction with uropathogenic *Escherichia coli*, and the course of UTIs, and model these to determine how they might intersect."

Uropathogenic *E. coli* also damage the bladder, says Mysorekar. "To repair the damage, new cells are produced that turn into specialized cells which make up the new bladder barrier," she says. "In the absence of estrogen," as in post-menopausal women, "this repair process was severely disrupted." Among other things, abnormally elevated levels of immune system cytokines may damage bladder cells. In the mouse menopause model, "the cytokine levels are very high," she says. However, the researchers found that estrogen supplementation can reduce the levels of cytokines, as well as the infectious reservoirs to levels found pre-menopausally, mitigating the infection and the resulting damage.

The goal of the current research was "to develop a definitive model of UTIs in menopause, to understand both the effect of loss of estrogen on the course of infection, and to determine whether estrogen therapy would be effective," says Mysorekar.

"The long term goal of my lab is to identify the molecular and genetic pathways that govern the estrogenic regulation of normal bladder function, and how it is altered during bladder disease and in menopause," says Mysorekar. "Our findings lay the groundwork for exploring the mechanism of estrogenic action and for testing hormone therapy efficacy in our animal model, and eventually in humans."

UTI symptoms include frequent urination, often accompanied by a burning sensation, cloudy, bad-smelling urine, and pelvic pain. They can be dangerous if they spread to the kidneys.

(C. Wang, J.W. Symington, E. Ma, B. Cao, and I.U. Mysorekar, 2013. Estrogenic modulation of uropathogenic *Escherichia coli* infection pathogenesis in a murine menopause model. Infect. Immun.)

MICROBIOLOGY IN THE NEWS

(from: http://www.eurekalert.org/bysubject/index.php?kw=33)

UNC scientists unveil a superbug's secret to antibiotic resistance

Proceedings of the National Academy of Sciences
January 30, 2013

Many strains of the bacterium *Staphyloccocus aureus* are already resistant to all antibiotics except vancomycin. But as bacteria are becoming resistant to this once powerful antidote, *S. aureus* has moved one step closer to becoming an unstoppable killer. Now, researchers at the University of North Carolina at Chapel Hill have not only identified the mechanism by which vancomycin resistance spreads from one bacterium to the next, but have suggested ways to potentially stop the transfer.

Forsyth scientists gain new understanding of latent tuberculosis

Science Translational Medicine
January 30, 2013

Scientists at the Forsyth have gained new insight on how Tuberculosis (TB) remains a global epidemic. The Forsyth team, and its collaborators from Stanford University, has recently discovered that Mycobacterium tuberculosis, the bacteria that causes TB, can lay dormant and thrive within bone marrow stem cells.

Discovery of sexual mating in *Candida albicans* could provide insights into infections

Nature
January 30, 2013

Like many fungi and one-celled organisms, *Candida albicans*, a normally harmless microbe that can turn deadly, has long been thought to reproduce without sexual mating. But a new study by Professor Judith Berman and colleagues at the University of Minnesota and Tel Aviv University shows that *C. albicans* is capable of sexual reproduction. The finding, published online by Nature Jan. 30, represents an important breakthrough in understanding how this pathogen has been shaped by evolution.

Important Dates

March 11, 2013:	Abstract form due for Annual IBASM meeting
March 12, 2013:	Registration form due for Annual IBASM meeting
April 12-13, 2013:	Annual IBASM meeting at McCormick's Creek State Park
May 18-21, 2013:	113th Annual Meeting of the ASM, Denver, CO

2012-2013 IBASM OFFICERS

Rebecca Sparks-Thissen, Ph.D., President. Biology Department, University of Southern Indiana, Evansville, IN 47712. Phone: (812) 465-1642; e-mail: rlsparksth@usi.edu

Christian Chauret, Ph.D., Secretary/Treasurer. Department of Biology, Indiana University Kokomo, Kokomo, IN 46904. Phone: (765) 455-9290; e-mail: cchauret@iuk.edu

Jennifer Metzler, Ph.D., Councilor. Department of Biology, Ball State University, Muncie, IN 47306. Phone: (765) 285-8848; e-mail: jametzler@bsu.edu

John McKillip, Ph.D., Alternate Councilor. Department of Biology, Ball State University, Muncie, IN 47306. Phone: (765) 285-8830; e-mail: jlmckillip@bsu.edu

Jim Mitchell, Ph.D., Educational Representative. Department of Biology, Ball State University, Muncie, IN 47306. Phone: (765) 285-8820; e-mail: jkmitchell@bsu.edu

Shivi Selvaratnam, Ph.D., Newsletter Editor. Office of Water Quality, Indiana Department of Environmental Management, Indianapolis, IN 46219. Phone: (317) 308-3088; e-mail: sselvara@idem.in.gov