Final Program
### Friday, May 21, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 9:00 AM</td>
<td>Breakfast</td>
<td>Holiday Inn Superdome Ballroom A/B</td>
</tr>
<tr>
<td>7:30 AM</td>
<td>Badge &amp; Program Pick-Up</td>
<td>UC Third Floor Lobby</td>
</tr>
<tr>
<td>8:00 – 11:30 AM</td>
<td>Pre-Conference Workshops</td>
<td>NCF Rooms 102 &amp; 105 &amp; NCF-A Room 470</td>
</tr>
<tr>
<td>11:30 AM – 1:00 PM</td>
<td>Lunch</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td>11:30 AM – 1:00 PM</td>
<td>Faculty Leaders Orientation</td>
<td>UC Room 315 (Lunch will be served)</td>
</tr>
<tr>
<td>1:00 – 2:00 PM</td>
<td>Opening Plenary</td>
<td>UC Ballroom B</td>
</tr>
<tr>
<td></td>
<td>Microbes at Work in Nature</td>
<td>James M. Tiedje</td>
</tr>
<tr>
<td>2:30 – 3:00 PM</td>
<td>Breakout Introduction</td>
<td>UC Ballroom B</td>
</tr>
<tr>
<td></td>
<td>Best Laboratory Exercises</td>
<td>Erica Suchman and Mark Martin</td>
</tr>
<tr>
<td>3:00 – 5:00 PM</td>
<td>Breakout Sessions</td>
<td>UC Various Locations</td>
</tr>
<tr>
<td>5:30 – 7:00 PM</td>
<td>Dinner</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td>7:00 – 8:00 PM</td>
<td>Entertainment</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td></td>
<td>Creative Best Practices – Encore Performance</td>
<td>Helen Davies</td>
</tr>
<tr>
<td>8:00 – 9:00 PM</td>
<td>Reception</td>
<td>(sponsored by Benjamin Cummings) – UC 2nd Floor Terrace</td>
</tr>
</tbody>
</table>

### Saturday, May 22, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 8:00 AM</td>
<td>Breakfast</td>
<td>Holiday Inn Superdome Ballroom A/B</td>
</tr>
<tr>
<td>7:30 AM</td>
<td>Badge &amp; Program Pick-Up</td>
<td>UC Third Floor Lobby</td>
</tr>
<tr>
<td>8:30 – 9:30 AM</td>
<td>Plenary Session</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td></td>
<td>The Latest Research on the Biological Basis of Thinking and Learning</td>
<td>Kenneth Wesson</td>
</tr>
<tr>
<td>9:45 – 10:45 AM</td>
<td>Concurrent Sessions I</td>
<td>LRC, UC &amp; NCF</td>
</tr>
<tr>
<td>10:45 – 11:15 AM</td>
<td>Break</td>
<td>UC Third Floor Lobby</td>
</tr>
<tr>
<td>11:15 AM – 12:15 PM</td>
<td>Concurrent Sessions II</td>
<td>LRC, UC, NCF &amp; NCF-A</td>
</tr>
<tr>
<td>12:15 – 1:15 PM</td>
<td>Lunch</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td>1:30 – 2:30 PM</td>
<td>Plenary Session</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td></td>
<td>Moving from Research to Practice: A Focus on Learning in Biology Courses</td>
<td>Barbara Millis</td>
</tr>
<tr>
<td>2:45 – 5:30 PM</td>
<td>Breakout Sessions</td>
<td>UC Various Locations</td>
</tr>
<tr>
<td></td>
<td>Finding Solutions to Biggest Challenges</td>
<td></td>
</tr>
<tr>
<td>5:30 – 7:00 PM</td>
<td>Dinner</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td>7:00 – 9:15 PM</td>
<td>Posters/Exhibits and Reception</td>
<td>UC Ballroom B</td>
</tr>
</tbody>
</table>

### Sunday, May 23, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 8:00 AM</td>
<td>Breakfast</td>
<td>Holiday Inn Superdome Ballroom A/B</td>
</tr>
<tr>
<td>7:30 AM</td>
<td>Badge &amp; Program Pick-Up</td>
<td>UC Third Floor Lobby</td>
</tr>
<tr>
<td>8:30 – 9:30 AM</td>
<td>Plenary Session</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td></td>
<td>Adaptive Mutation: Selection Can Speed Appearance of Mutants Without Changing the Mutation Rate</td>
<td>John R. Roth</td>
</tr>
<tr>
<td>9:45 – 10:45 AM</td>
<td>Concurrent Sessions III</td>
<td>LRC, UC &amp; NCF</td>
</tr>
<tr>
<td>11:00 – 11:30 AM</td>
<td>Conference Wrap-Up and Evaluation</td>
<td>UC Ballroom A</td>
</tr>
</tbody>
</table>

### Legend

<table>
<thead>
<tr>
<th>Building</th>
<th>Campus Map Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC</td>
<td>University Center</td>
</tr>
<tr>
<td>NCF</td>
<td>Norman C. Francis Academic Science Complex</td>
</tr>
<tr>
<td>NCF-A</td>
<td>NCF/ASC Addition</td>
</tr>
<tr>
<td>LRC</td>
<td>Library Resource Center</td>
</tr>
</tbody>
</table>
Conference Welcome

We are pleased to welcome you to the 2004 ASM Conference for Undergraduate Educators, “Facilitating Student Learning in Diverse Environments.” The ASM staff and many volunteers have worked hard over the last ten months to develop and build a program that is informative and content-rich. We hope that you enjoy the outstanding plenary lectures, concurrent sessions, roundtable discussions, poster presentations and exhibit program. Please take time to connect with friends and, if you’re a “veteran,” make certain to welcome “first-timers” who make up nearly 55% of the attendees this year.

Words of appreciation go to the co-sponsors at Xavier University of Louisiana: the Center for the Advancement of Teaching and the Department of Biology. We would like to thank our abstract and travel grant reviewers for the time they spent contributing to the quality of the conference. Also, we are pleased to announce that Benjamin Cummings is generously co-sponsoring the Friday evening reception.

As you will see, the conference is continually growing and word-of-mouth is spreading. Previous attendees have been our best marketers. We have a record number of attendees, exhibitors and poster presentations this year. In fact, for the first time, posters have been separated into Teaching Approaches, Hands-on Projects, Independent Projects, Outreach and Teaching Tools.

Thank you for your dedication to microbiology education and your obvious commitment to continue educating yourself. We look forward to your active participation and hope you enjoy the conference.

Respectfully,

JEFFREY POMMERVILLE
Department of Biology
Maricopa Community College

LUCY KLUCKHOHN JONES
Life Science Department
Santa Monica College

The Twelfth Annual ASM
Conference for Undergraduate Educators
June 3 -5, 2005
Atlanta, Georgia

Conference Co-Chairs:
Sue Merkel
Cornell University

Kristine Snow
Fox Valley Technical College

Watch www.asmcue.org for further information as it becomes available.
Conference Planning Committee

11th ASM Conference for Undergraduate Educators
"Facilitating Student Learning in Diverse Environments"
May 21 - 23, 2004
Xavier University of Louisiana, New Orleans, LA

Committee Co-Chairs

JEFFREY POMMERVILLE
Dept. of Biology
Maricopa Community College
Glendale, AZ

LUCY KLUCKHOHN JONES
Life Science Dept.
Santa Monica College
Santa Monica, CA

Abstract Reviewers

BRUCE M. ALEXANDER
Dept. of Microbiology & Immunology
University of North Carolina
Chapel Hill, NC

MIN-KEN LIAO
Dept. of Biology
Furman University
Greenville, SC

DAVID WESTENBERG
Dept. of Biological Sciences
University of Missouri-Rolla
Rolla, MO

Xavier University of Louisiana Hosts

TODD STANISLAV
Director, Center for the Advancement of Teaching
and Associate Professor, Dept. of Biology
Xavier University of Louisiana
New Orleans, LA

WILLIAM WHALEN
Dept. of Biology
Xavier University of Louisiana
New Orleans, LA

Education Board
American Society for Microbiology

CLIFFORD W. HOUSTON
Chair, ASM Education Board
University of Texas Medical Branch
Galveston, TX

NEIL BAKER
Chair, ASM Committee on Undergraduate Education
Dept. of Microbiology
The Ohio State University
Columbus, OH

Education Department
American Society for Microbiology

AMY CHANG
Director, Education Dept.
achang@asmusa.org

KELLY GULL
Manager, Faculty Programs
kgull@asmusa.org

KRISTEN CATLIN-LEBARON
Coordinator, Education Resources
klebaron@asmusa.org
2004 ASMCUE General Information
“Facilitating Student Learning in Diverse Environments”

Meeting Statistics
There are 247 total registrants representing 234 attendees and 13 exhibitors. A breakdown of the registrations follows:

- 137 First-time attendees (55%)
- 14 International Attendees:
  - Canada – 8
  - France – 1
  - Netherlands – 1
  - Philippines – 1
  - United Kingdom – 3
- 205 ASM Members
- 29 Non-members

Travel Awards
Ten Early-Career travel grant applications were funded (out of 11 received). Recipients receive a travel subsidy to present posters at the meeting.

Seven Faculty Enhancement Program travel grant applications were funded (out of 7 received). Recipients receive a travel subsidy and a one-year introductory membership to ASM.

Check-in and Name Badges
The central information desk and check-in area will be in the lobby of the third floor of the University Center. Please visit the information desk to direct any questions you may have to ASM staff members.

Name badges permit attendees’ entrance into all sessions, conference meals and bus transportation. Please wear your name badge to all conference functions.

XULA Campus
Campus maps have been provided. All sessions for the conference will be held in one of four buildings, the University Center (UC), Library Resource Center (LRC) and the Norman C. Francis Academic Science Complex (NCF) and the NCF/ASC Addition (NCF-A).

Meals
Breakfast will be available in Ballroom A/B of the Holiday Inn Superdome Friday through Sunday. Lunch and dinner Friday and Saturday will be served in Ballroom A of the University Center. The registration fee covers all meals, as well as the Friday night reception to be held on the second floor Terrace of the University Center and the Saturday night reception during the Exhibit and Poster session in Ballroom B of the University Center. Guests are not permitted at meals.
Bus Service
Shuttle buses will run between the 2004 ASMCUE headquarters hotel (Holiday Inn Downtown Superdome) and XULA Friday-Sunday. Please note that service will run each morning and at the end of the day, but will not be continuous throughout the day. At the end of the conference Sunday, the final bus will leave XULA at 12:30pm and drop-off at the Holiday Inn. Participants are responsible for transportation to their next destination. The schedule is as follows:

Friday, May 21
7:00am – 3:00 PM
7:00pm – 10:00 PM

Saturday, May 22
7:00am – 10:00 AM
7:00pm – 10:00 PM

Sunday, May 23
7:30am – 12:30 PM

Poster Presentations
A poster session will be held Saturday, May 22 from 7:00 – 9:15pm in Ballroom B of the University Center. Authors may set up their posters beginning at 12:00 noon on Saturday. All poster presentations should be ready by 7:00pm. Authors must remove their posters between 9:15 – 9:45 PM.

Exhibits
The Exhibit Showcase will be held Saturday, May 22 from 7:00 – 9:15pm in Ballroom B of the University Center. Exhibitors may set up from 12:00 – 7:00pm on Saturday. All exhibits must be dismantled between 9:15 – 9:45 PM.

Meeting Evaluation
A conference evaluation will be sent via email to attendees immediately following the conference. Please take time to fill out the survey so that we may serve your future needs.
The American Society for Microbiology and the Committee on Undergraduate Education Would Like to Congratulate the 2004 Faculty Enhancement Program and Early-Career Travel Grant Awardees!

**Faculty Enhancement Program Awardees:**

- **Connie Chow**  
  Simmons College, Boston, MA
- **Marc Daniels**  
  William Carey College, New Orleans, LA
- **Alenka Hlousek-Radojcic**  
  Richard Bland College, Petersburg, VA
- **Veronica Neumann**  
  Milwaukee Area Technical College, Milwaukee, WI
- **Randy Strobel**  
  Metropolitan State University, St. Paul, MN
- **Joel Stryker**  
  Evergreen Valley College, San Jose, CA

**Early-Career Travel Grant Awardees:**

- **Pia Marie Albano**  
  La Consolacion College, Manila, Phillipines
- **Jean Cardinale**  
  Alfred University, Alfred, NY
- **Josephine Ebomoji**  
  University of North Colorado, Greeley, CO
- **Mary Farone**  
  Middle Tennessee State University, Murfreesboro, TN
- **Janelle Hare**  
  Morehead State University, Morehead, KY
- **Steven Lipson**  
  St. Francis College, Brooklyn, NY
- **Iruka Okeke**  
  Haverford College, Haverford, PA
- **Elise Sullivan**  
  University of New Hampshire, Durham, NH
- **Sattiraju Sundari**  
  Jaypee Institute of Information Technology, Uttar Pradesh, India
- **Davis Treves**  
  Indiana University Southeast, New Albany, IN
The American Society for Microbiology would like to thank the following sponsor of the Friday Evening Reception:

**BENJAMIN CUMMINGS**  
San Francisco, CA  
www.aw-bc.com

The American Society for Microbiology would like to thank the following exhibitors for their participation in the Conference:

**AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY**  
Bethesda, MD  
www.asbmb.org

**BIOSciEdNet (BEN) COLLABORATIVE**  
Washington, D.C.  
www.biosciednet.org

**BENJAMIN CUMMINGS**  
San Francisco, CA  
www.aw-bc.com

**EAGLE VISION EDITIONS**  
Vista, CA  
daphne.palomar.edu/galderson/

**EDVOTEK**  
Bethesda, MD  
www.edvotek.com

**EAGLE VISION EDITIONS**  
Vista, CA  
daphne.palomar.edu/galderson/

**HAYDEN-MCNEIL SPECIALTY PRODUCTS**  
Plymouth, MI  
www.hmpublishing.com

**JONES AND BARTLETT PUBLISHERS**  
Sudbury, MA  
www.jbpub.com

**LI-COR**  
Lincoln, NE  
www.licor.com

**McGRAW-HILL HIGHER EDUCATION**  
New York, NY  
www.mhhe.com

**MIT, CENTER FOR GENOME RESEARCH**  
Cambridge, MA  
www.broad.mit.edu/broad/wicgr.html

**NATIONAL CENTER FOR BIOTECHNOLOGY INFORMATION**  
Bethesda, MD  

**PRENTICE HALL**  
Upper Saddle River, NJ  
www.prenhall.com

**U.S. DEPARTMENT OF ENERGY GENOME PROGRAMS**  
Oak Ridge, TN  
www.doegenomes.org

**WILEY**  
Hoboken, NJ  
www.wiley.com

The Exhibit Showcase will be held from 7:00 – 9:15 p.m. on Saturday, May 22 in the University Center, Third Floor, Ballroom B.
Facts about Xavier University of Louisiana

Established: 1915 by Saint Katharine Drexel and the Sisters of the Blessed Sacrament

Type of Institution: The only Historically Black Catholic University in the Western Hemisphere

Mission: Xavier University of Louisiana is Catholic and historically Black. The ultimate purpose of the University is the promotion of a more just and humane society. To this end, Xavier prepares its students to assume roles of leadership and service in society. This preparation takes place in a pluralistic teaching and learning environment that incorporates all relevant educational means, including research and community service.

Accreditation: Accredited by Commission on Colleges of the Southern Association of Colleges and Schools

Major Divisions: College of Arts and Sciences, College of Pharmacy, Graduate School

Degrees Offered: Bachelor of Arts, Bachelor of Science, Bachelor of Music, Master of Arts, Master of Science, Master of Theology, Doctor of Pharmacy

Affiliations: New Orleans Consortium – Xavier, Loyal Notre Dame Seminary
M.B.A. Program – Tulane University
M.S. in Statistics – L.S.U. Medical Center
Dual Degree Engineering Program – Louisiana State University, University of Detroit-Mercy, Georgia Institute of Technology, Southern University-Baton Rouge, University of New Orleans, University of Wisconsin, and Tulane University

President: Dr. Norman C. Francis
Senior V.P. for Academic Affairs: Dr. Deidre Labat
Senior V.P. for Administration: Mr. Calvin Tregre
Senior V.P. for Resource Development: Dr. Gene D’Amour
V.P. for Fiscal Services: Mr. Edward Phillips
V.P. for Institutional Advancement: Mr. Karl Turner
V.P. for Student Services: Mr. Joseph K. Byrd
Interim Dean, College of Arts and Sciences: Dr. Kenneth Boutte
Dean, College of Pharmacy: Dr. Wayne Harris
Dean, Graduate School: Dr. Alvin J. Richard

Enrollment: 3,994 (2002-2003); including College of Arts & Sciences (3,143), College of Pharmacy (485), and Graduate School (325). 51% of students are from in-state; the remaining 49% come from 41 other states, D.C., the Virgin Islands, and 14 countries. 85% of students are African American, 3% White, and 12% Asian, Hispanic or other.

Colors: Gold and White

Mascot: Gold Rush (Men) and Gold Nuggets (Women)

Motto: “Deo Adjuvante, Non Timendum”
With God Helping Us, There is Nothing to Fear
### FRIDAY, MAY 21, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 9:00 AM</td>
<td>Breakfast</td>
<td>Holiday Inn Superdome Ballroom A/B</td>
</tr>
<tr>
<td>7:00 AM – 3:00 PM</td>
<td>Bus Service</td>
<td>Holiday Inn - XULA</td>
</tr>
<tr>
<td>7:30 AM</td>
<td>Badge &amp; Program Pick-Up</td>
<td>UC Third Floor Lobby</td>
</tr>
<tr>
<td>8:00 – 11:30 AM</td>
<td>Pre-Conference Workshops</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Behind Closed Doors: The Clinical Microbiology Laboratory and What REALLY Goes On in There</td>
<td>NCF-A Room 470</td>
</tr>
<tr>
<td></td>
<td>Rebecca Buxton, University of Utah</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Punam Verma, Rush-Presbyterian-St. Luke’s Medical Center</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lisa Skodack-Jones, ARUP Laboratories</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Creating Positive Learning Environments for Your Students: Strategies for Teaching the Psychology of Learning</td>
<td>NCF Room 105</td>
</tr>
<tr>
<td></td>
<td>Todd Zakrjasek, Central Michigan University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electronic Classrooms: Instant Feedback to Bioinformatics</td>
<td>NCF Room 102</td>
</tr>
<tr>
<td></td>
<td>Nitsa Rosenzweig, Xavier University of Louisiana</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marion Carroll, Xavier University of Louisiana</td>
<td></td>
</tr>
<tr>
<td>11:30 AM – 1:00 PM</td>
<td>Lunch</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td></td>
<td>Faculty Leaders Orientation and Lunch</td>
<td>UC Room 315</td>
</tr>
<tr>
<td>1:00 – 2:00 PM</td>
<td>Opening Plenary: Microbes at Work in Nature</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UC Ballroom B</td>
<td></td>
</tr>
<tr>
<td></td>
<td>James M. Tiedje, Michigan State University</td>
<td></td>
</tr>
<tr>
<td>2:30 – 3:00 PM</td>
<td>Breakout Introduction: Best Laboratory Exercises</td>
<td>UC Ballroom B</td>
</tr>
<tr>
<td></td>
<td>Erica Suchman, Colorado State University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mark O. Martin, Occidental College</td>
<td></td>
</tr>
<tr>
<td>3:00 – 5:00 PM</td>
<td>Breakout Sessions: Best Laboratory Exercises</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breakout Groups A – E</td>
<td>UC Ballroom B</td>
</tr>
<tr>
<td></td>
<td>Breakout Group F</td>
<td>UC Room 201</td>
</tr>
<tr>
<td></td>
<td>Breakout Groups G, H &amp; I</td>
<td>UC Room 205</td>
</tr>
<tr>
<td></td>
<td>Breakout Groups J &amp; K</td>
<td>UC Room 205C</td>
</tr>
<tr>
<td></td>
<td>Breakout Group L &amp; M</td>
<td>UC Third Floor Lobby</td>
</tr>
<tr>
<td></td>
<td>Breakout Group N</td>
<td>UC Room 315</td>
</tr>
<tr>
<td>5:30 – 7:00 PM</td>
<td>Dinner</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td>7:00 – 10:00 PM</td>
<td>Bus Service</td>
<td>XULA - Holiday Inn</td>
</tr>
<tr>
<td>7:00 – 8:00 PM</td>
<td>Creative Best Practices – Encore Performance</td>
<td>UC Ballroom A</td>
</tr>
<tr>
<td></td>
<td>Helen Davies, University of Pennsylvania</td>
<td></td>
</tr>
<tr>
<td>8:00 – 9:00 PM</td>
<td>Reception</td>
<td>UC Second Floor Terrace</td>
</tr>
</tbody>
</table>

### SATURDAY, MAY 22, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 8:00 AM</td>
<td>Breakfast</td>
<td>Holiday Inn Superdome Ballroom A/B</td>
</tr>
<tr>
<td>7:00 – 10:00 AM</td>
<td>Bus Service</td>
<td>Holiday Inn - XULA</td>
</tr>
<tr>
<td>7:30 AM</td>
<td>Badge &amp; Program Pick-Up</td>
<td>UC Third Floor Lobby</td>
</tr>
<tr>
<td>Time</td>
<td>Concurrent Sessions I</td>
<td>Concurrent Sessions II</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8:30 – 9:30 AM</td>
<td>Plenary Session: The Latest Research on the Biological Basis of Thinking and Learning</td>
<td>11:15 AM – 12:15 PM Biofilms in the Undergraduate Microbiology Curriculum</td>
</tr>
<tr>
<td></td>
<td>UC BALLROOM A</td>
<td>LRC ROOM 501 John Lennox, Penn State Altoona College</td>
</tr>
<tr>
<td></td>
<td>Kenneth Wesson, Education Consultant: Neuroscience</td>
<td></td>
</tr>
<tr>
<td>9:45 – 10:45 AM</td>
<td>Concurrent Sessions I</td>
<td>* So You Want to Develop a Virtual Biology Laboratory Course?</td>
</tr>
<tr>
<td></td>
<td>Biofilms in the Undergraduate Microbiology Curriculum</td>
<td>LRC ROOM 502 Michael Dennis, Montana State University – Billings Sue Merkel, Cornell University</td>
</tr>
<tr>
<td></td>
<td>LRC ROOM 501 John Lennox, Penn State Altoona College</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* So You Want to Develop a Virtual Biology Laboratory Course?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LRC ROOM 502 Michael Dennis, Montana State University – Billings Sue Merkel, Cornell University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hidden in Plain Sight</td>
<td>* Engaging Students in Undergraduate Research</td>
</tr>
<tr>
<td></td>
<td>UC ROOM 205 Betsey Dexter Dyer, Wheaton College</td>
<td>NCF-A ROOM 130 Alix Darden, The Citadel</td>
</tr>
<tr>
<td></td>
<td>Student Incivilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UC ROOM 205C Terri Hamrick, Campbell University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incorporating Math and Chemistry into Your Microbiology Course</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NCF ROOM 105 Judith Kandel, California State University – Fullerton</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fermentation and Active Learning Strategies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NCF ROOM 102 Robin Patterson, Butler County Community College</td>
<td></td>
</tr>
<tr>
<td>10:45 – 11:15 AM</td>
<td>Break</td>
<td>12:00 – 7:00 PM Poster and Exhibitor Set-Up</td>
</tr>
<tr>
<td></td>
<td>UC THIRD FLOOR LOBBY</td>
<td>UC BALLROOM B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12:15 – 1:15 PM Lunch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UC BALLROOM A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:30 – 2:30 PM Plenary Session: Moving from Research to Practice: A Focus on Learning in Biology Courses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UC BALLROOM A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barbara Millis, U.S. Air Force Academy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2:45 – 5:30 PM Breakout Sessions: Finding Solutions to Biggest Challenges</td>
</tr>
</tbody>
</table>

* Seating limited, please register at Check-In Desk, UC Third Floor Lobby

2
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 – 10:00 PM</td>
<td>Bus Service</td>
<td>XULA – Holiday Inn</td>
<td></td>
</tr>
<tr>
<td>7:00 – 9:15 PM</td>
<td>Poster Session and Exhibit Showcase</td>
<td>UC Ballroom B</td>
<td></td>
</tr>
<tr>
<td>8:00 – 9:15 PM</td>
<td>Reception</td>
<td>UC Ballroom B</td>
<td></td>
</tr>
<tr>
<td>9:15 – 9:45 PM</td>
<td>Poster and Exhibits Breakdown</td>
<td>UC Ballroom B</td>
<td></td>
</tr>
<tr>
<td>9:45 – 10:45 AM</td>
<td>Concurrent Sessions III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5:30 – 7:00 PM</td>
<td>Dinner</td>
<td>UC Ballroom A</td>
<td></td>
</tr>
<tr>
<td>7:00 – 10:00 PM</td>
<td>Bus Service</td>
<td>XULA – Holiday Inn</td>
<td></td>
</tr>
<tr>
<td>7:00 – 9:15 PM</td>
<td>Poster Session and Exhibit Showcase</td>
<td>UC Ballroom B</td>
<td></td>
</tr>
<tr>
<td>8:00 – 9:15 PM</td>
<td>Reception</td>
<td>UC Ballroom B</td>
<td></td>
</tr>
<tr>
<td>9:15 – 9:45 PM</td>
<td>Poster and Exhibits Breakdown</td>
<td>UC Ballroom B</td>
<td></td>
</tr>
<tr>
<td><strong>Sunday, May 23, 2004</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:00 – 8:00 AM</td>
<td>Breakfast</td>
<td>Holiday Inn Superdome Ballroom A/B</td>
<td>Erica Suchman, Colorado State University</td>
</tr>
<tr>
<td>7:30 AM – 12:30 PM</td>
<td>Bus Service</td>
<td>Holiday Inn - XULA</td>
<td></td>
</tr>
<tr>
<td>7:30 AM</td>
<td>Badge &amp; Program Pick-Up</td>
<td>UC Third Floor Lobby</td>
<td></td>
</tr>
<tr>
<td>8:30 – 9:30 AM</td>
<td>Plenary Session: Adaptive Mutation: Selection Can Speed Appearance of Mutants Without Changing the Mutation Rate</td>
<td>UC Ballroom A</td>
<td>John R. Roth, University of California – Davis</td>
</tr>
<tr>
<td>11:00 – 11:30 AM</td>
<td>Conference Wrap-Up and Evaluation</td>
<td>UC Ballroom A</td>
<td>Jeffrey Pommerville, Lucy Kluckhohn-Jones, Sue Merkel, and Kristine Snow</td>
</tr>
<tr>
<td>12:30 PM</td>
<td>Last Bus to Holiday Inn</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Microbial life originated about 3.8 billion years ago and through evolutionary time and under a tremendous variety of conditions, has explored all types of catalytic capacities, physiologies, chemistries, morphologies and life strategies. Eighty-five percent of prokaryotic history occurred before Pangaea broke up! What an opportunity for innovation, which we explore today as biodiversity. The microbial world is the largest unexplored biological resource; this is of interest for fundamental discoveries about the strategies and limits of life, for new biotechnology products and for understanding emerging disease challenges. Microbes are the by far the most numerous organisms on Earth and have a biomass that is equal to that of all plants. Their most important role is in recycling the elements of life, sustaining the biogeochemical cycles and hence maintaining the habitability of our planet. As examples, I will describe unusual microbes that live by halorespiration, i.e. using some of our most serious water pollutants as terminal electron acceptors for respiratory growth, microbes that live at -10C in Siberian permafrost and others that carry novel antibiotic resistances. I will also show how our knowledge has grown through 16S rRNA gene sequences, now at over 80,000 such sequences in the ribosomal database. Furthermore, with 140 microbial genomes published, we can explore the microbial world from its blueprint and I will show what we have learned about the prokaryotic species concept from genomic insight.

Dr. James Tiedje is a University Distinguished Professor of Microbiology and Soil Science, and is Director of the Center for Microbial Ecology at Michigan State University. He received his B.S. degree from Iowa State University and his M.S. and Ph.D. degrees from Cornell University. He has 30 years experience leading research in microbial ecology and physiology, especially regarding the nitrogen cycle and biodegradation of environmental pollutants. His group has discovered several new microbes that live by halorespiration on chlorinated solvents. Some of the dechlorination processes carried out by these microbes have reduced the environmental burden of PCB, DDT, and chlorinated solvents. He has been Editor-in-Chief of Applied and Environmental Microbiology and Editor of Microbial and Molecular Biology Reviews. He has over 300 refereed papers including 7 in Science and Nature. He has received Environmental Award from the American Society of Microbiology and shared the 1992 Finley Prize given by UNESCO for research contributions in microbiology of international significance. He is Fellow of the AAAS, the American Academy of Microbiology, and the Soil Science Society of America, and is past president of the International Society of Microbial Ecology. He is a member of the U.S. National Academy of Sciences and President-Elect of the American Society for Microbiology.
The Latest Research on the Biological Basis of Thinking and Learning
PLENARY SESSION: SATURDAY, MAY 22, 8:30 AM, UC BALLROOM A

Kenneth A. Wesson
Education Consultant, Neuroscience
San Jose, CA

If it's your job to develop the mind, shouldn't you know how the brain works? The biologically based operating principles by which the human brain organizes, stores and retrieves information were previously well-guarded neurological secrets. Not only are these unraveling mysteries undergoing long overdue disclosure, but they are also receiving an increased amount of attention from educators. In years past, we would thoroughly scrutinize human learning and knowledge acquisition, while seldom ever mentioning the dominant role of the human brain. The most recent advances in the fields of molecular biology, medicine, brain-imaging and the emerging branches of the cognitive neurosciences, have merged allowing for a more coherent look at the structural, functional and chemical aspects of just how the brain does "work." Through the brain's impressively elastic ability to reshape itself as it agilely responds to its environment, the human brain may expand, contract or recast itself based on the quantity and richness of the experiences it encounters, including learning.

However, there are still several fundamentally important incongruities wedged between this new knowledge reservoir and contemporary educational practices. Classroom learning can be enhanced when educators are cognizant of the processes by which the brain best operates. Traditional instructional practices in higher education seem to warrant revisiting. A "brain-considerate" (consistent with the brain's natural inclinations for learning) restructuring of classroom environments to accommodate the brain's preferred processing strategies will enhance student success regardless of age.

It has been said that the next great journey of discovery for humankind will not take place in outer space, but inside the inner space of the human brain. Higher education should reserve a first-class ticket on that voyage.

Kenneth Wesson delivers keynote addresses on the neuroscience of learning for educational organizations and institutions throughout the United States and overseas. His audiences range from preschool and early childhood specialists to college and university-level administrators and faculty members. His recent international audiences have included educators and chief administrative officers from South America, Asia, Eastern Europe, the Middle East, Northern Africa, and sub-Saharan Africa. Wesson regularly addresses educational organizations, counseling associations, school districts and civic groups, as well as parenting organizations on establishing "brain-considerate" learning environments. In addition to his speeches on the neuroscience of learning, Wesson also speaks on the subjects of early brain development, emotional intelligence, contextual learning, diversity in learning, design and engineering, and curriculum development. He is also frequently asked to serve as an expert witness in court cases involving brain trauma and memory. Last year, he spoke to educators and administrators from 6 of the world's 7 continents including audiences in Asia, Eastern Europe, the Pacific Islands and Great Britain.

Each year, Shell Oil Company sponsors five "Shell Science Seminars" at the National Science Teachers Association's annual conference. Recent Shell Science Scholars include the winner of the 1998 Nobel Prize for Physics and the Co-director of the Human Genome Project. Wesson was selected by the NSTA and Shell Oil Company as one of the 2003 Shell Science Scholars.

Wesson's most recent articles on the brain include: "What Recent Brain Research Tells Us About Learning," "Where is God in the Brain?" (The Neurophysiological Correlates of Religiosity) and "Memory and the Brain."
Moving from Research to Practice:
A Focus on Learning in Biology Courses
PLENARY SESSION: SATURDAY, MAY 22, 1:30 PM, UC BALLROOM A

Barbara Millis, Ph.D.
Director, Faculty Development
U.S. Air Force Academy
Colorado Springs, CO

During this session, participants will gain insights into how students learn with practical implications and examples for biology courses. There will be biology-specific examples related to sound student learning. Participants will learn at least three specific classroom techniques they can apply immediately to strengthen student learning of their discipline. This session is planned for participants who like a little theory but a lot of practical activities.

Dr. Barbara J. Millis, Director of Faculty Development at the US Air Force Academy, who will begin 1 July as Director of the Excellence in Teaching Program at the University of Nevada at Reno, received her Ph.D. in English literature from Florida State University. She frequently offers presentations at professional conferences (AAHE, AAC&U, Lilly Teaching Conferences, etc.) and for various colleges and universities and also publishes widely. Oryx Press published in 1998 a book, co-authored with Philip Cottell, Cooperative Learning for Higher Education Faculty. In 2002 Stylus Press published Using Simulations to Enhance Learning in Higher Education, co-authored with John Hertel. Her IDEA paper, “Enhancing Learning-and More!-through Cooperative Learning,” is available at http://www.idea.ksu.edu/papers/pdf/Idea_Paper_38.pdf.

In 1998 Dr. Millis received the US Air Force Academy's prestigious McDermott Award for Research Excellence in the Humanities and Social Sciences and the Outstanding Educator Award. After the Association of American Colleges and Universities selected the Air Force Academy as a Leadership Institution in Undergraduate Education in 2001, she began serving as the liaison to the AAC&U's Greater Expectations Consortium on Quality Education. In Fall 2002 Barbara loved being a Visiting Scholar at Victoria University, Wellington, New Zealand.

Related Session:
2004 ASMCUE Roundtable Discussion Groups:
Biggest Challenges

FOLLOWING PLENARY SESSION: SATURDAY, MAY 22, 2:45 PM, UC BALLROOM A

Although the Best Practices and Biggest Challenges sessions have been a favorite of past conferences, the challenges have often been overlooked. In 2004, a session will be devoted to identifying some of the challenges we share, and, with background tools provided by plenary speakers Kenneth Wesson and Barbara Millis, to finding solutions to some of those challenges. Barbara Millis’ paper, “Enhancing Learning – and More! – Through Cooperative Learning,” will be a cornerstone of this session.
Adaptive Mutation: Selection Can Speed Appearance of Mutants Without Changing the Mutation Rates
PLENARY SESSION: SUNDAY, MAY 23, 8:30 AM, UC BALLROOM A

John R. Roth, Ph.D.
Professor of Microbiology
University of California - Davis
Davis, CA

Since Darwin, it has been suggested that selective pressure (stress) might induce mutations. Classic experiments of Luria and Delbrueck demonstrated that some mutations arise without selection, but left open the possibility that others arise in response to stress. A system devised by Cairns suggested (to some) that stress induces mutagenesis of non-growing cells. We present evidence that this phenomenon is due to growth under selection and requires no increase in mutation rate. We propose that selection can detect mutations with very small effects on growth and allows the final revertant to be generated by a series of highly probably events -- amplification of the rate limiting allele. Sequence changes are made more frequent by growth under selection because more cells with more gene copies per cell are added to population. This increase in target number (rather than mutagenesis) is primarily responsible for the increase in revertant number. Thus the end-point is the reached by a series of nested clonal expansions. The process is made efficient in the Cairns system because the gene under selection is located on an F’plasmid, which stimulates the recombination rate and induces SOS mutagenesis. This mutagenesis is a side effect that contributes slightly but is neither sufficient nor necessary to explain the effect of selection. The process of amplification includes progressive shortening of the amplified unit (amplification focusing), which reduces the cost of amplification and allows a higher copy number to be attained.

Dr. John R. Roth earned his Ph.D. from The Johns Hopkins University in Baltimore, Maryland in 1965, working under Philip Hartman. He accepted a post-doctoral position with Bruce Ames at the National Institutes of Health, researching the control of histidine biosynthesis. His first faculty appointment was at the University of California – Berkeley, where he worked his way up to full professor. After nine years, he decided to move to the University of Utah to be in a big biology department to experience “all kinds of things.” After 25 years, he decided to move to the University of California – Davis, where he has taught the last two years.

His lab currently works on recombination and mutation, using chromosome rearrangements as the basis of recombination assays. Additionally, his lab is also researching cobalamin synthesis and its use. This has included work on the biosynthetic operon, but now the lab is mainly working on operon for the B-12 dependent degradation of ethanolamine. Another area of research in his lab is to learn about how NAD synthesis and recycling is controlled so as to do its essential jobs and avoid its toxic effects during oxidative stress.
2004 ASMCUE Round Table Discussion Session:
Best Laboratory Exercises
FRIDAY, MAY 21, 2:30 PM, UC BALLROOM B

Erica Suchman, Ph.D.
Department of Microbiology
Colorado State University
Fort Collins, CO

Mark O. Martin, Ph.D.
Department of Biology
Occidental College
Los Angeles, CA

At previous ASM undergraduate conferences, many participants have mentioned special laboratory exercises that they have found to be innovative, effective, and exciting. During this session we will meet in groups to discuss a selection of the "blue ribbon" laboratory exercises. Our goals are simple. We want to share your exercises and experiences with the entire group. We want to help you develop those exercises into a format that fits the ASM MicrobeLibrary (www.microbelibrary.org). Through group discussions, we can help you publish your best laboratory exercises for worldwide distribution through the ASM MicrobeLibrary.

Dr. Erica Suchman received her BA in biology from the University of California San Diego, and her Ph.D. in Molecular Biology and Biochemistry from the University of California, Irvine, where she worked on the role of retroviral promoters in pathogenesis and cellular tropism. Dr. Suchman is an associate professor of Microbiology at Colorado State University, and teaches general microbiology, general microbiology lab, virology and cell culture lab, and guest lecture in graduate and undergraduate virology.

Dr. Mark Martin is currently an assistant professor of Biology at Occidental College in Los Angeles, California. He and his undergraduate researchers study the genetics of the bacterial predator, *Bdellovibrio*. Mark received his B.A. degree from UCLA, and his Ph.D. from Stanford University. After several post-docs and a stint in industry, Mark remains a True Believer in what he calls "prokaryotic pride": that microbiologists are lucky enough to work on the most interesting and fun part of science.

2004 ASMCUE Creative Best Practices
Encore Performance
FRIDAY, MAY 21, 7:00 PM, UC BALLROOM A

Dr. Helen Davies, University of Pennsylvania Medical School professor of microbiology, former big-band song lady, and only woman winner of the American Medical Student Association's National Golden Apple Award for Teaching Excellence will present a light-hearted (...but deadly serious!) Medical Microbiology sing-along. The presentation will include such familiar tunes as "Hello, Herpes, Our Old Friend", "No Paeans for Prions", "Leprosy" ("...bits and pieces falling off of me"). Her personal warmth will charm you, and her words will ring in your ears for years to come. She has been interviewed by National Public Radio and Voice of America, on her innovative ways of teaching about emerging infectious diseases.
Biofilms in the Undergraduate Microbiology Curriculum

John Lennox, Penn State Altoona College
SATURDAY, MAY 22, 9:45 AM, LRC ROOM 501
SATURDAY, MAY 22, 11:15 AM, LRC ROOM 501

The past decade has seen a dramatic increase in our understanding of how bacteria exist in nature. It is now clear that most bacteria live in complex communities attached to surfaces and embedded in an extra-cellular polysaccharide that they themselves produce. These biofilm-grown cells have properties quite distance from their planktonic counterparts. This paper will serve to introduce biology teachers to this interesting topic. Each participant in the session will receive materials to help them construct equipment, master techniques and carry out exercises that will permit them to introduce biofilms to their classes. These materials will include methods for the construction of biofilm reactors and flow cells, techniques for growing, measuring and quantifying biofilm populations and exercises for determining the unique properties of biofilm associated cells such as antimicrobial resistance.

This session will also introduce participants to a new free educational resource for biofilm related materials, the website of the Biofilm Institute located at http://www.biofilm.org/. This site will be a growing source of educational materials related to biofilm microbiology.

John E. Lennox is a professor of Microbiology at the Penn State Altoona College and has been on the faculty at Penn State since 1968. Dr. Lennox received his Ph.D. from the University of Chicago. He has served as the chair of the education division (W) of the American Society for Microbiology and the two-year college division of the National Association of Biology Teachers. He received the Amoco Foundation Award for Excellence in Teaching Performance (1984), the Continuing Education Award for Academic Excellence (1992) and the National Association of Biology Teacher's Two-year College Biology Teaching Award. Dr. Lennox's research interests lie in the area of science teaching and the conversion of contemporary research into new pedagogical methods. He is currently writing curriculum materials based on recent research in biofilm microbiology. And serves as the education editor of the Biofilm Institutes web site Biofilms On-line.

Biosafety in the Teaching Laboratory

Erica Suchman, Colorado State University
SATURDAY, MAY 22, 11:15 AM, NCF ROOM 105
SUNDAY, MAY 23, 9:45 AM, UC BALLROOM A

Dr. Suchman led a session on TA training and laboratory safety at the 2002 ASM Undergraduate Educator's Conference (now ASMCUE). During this session a list of recommendations about TAs and laboratory safety was developed, but during the group’s discussions it became obvious that many instructors were unsure that they knew what constitutes a safe microbiology laboratory course. Therefore, at last year’s Conference, there was a session on general laboratory safety where general safety issues were discussed, but it again became clear that participants wanted to know more specifics about what constitutes a BSL-1 or BSL-2 organism, and what the Centers for Disease Control and Prevention recommendations are regarding how these should be handled. Therefore, during this session we will review the outcomes of the last two safety sessions, as well as familiarize participants with the organisms that are considered by ATCC and the CDC to be BSL-1 and 2 and the CDC guidelines surrounding the use of these organisms. Based on the CDC recommendations and the proposals developed over the last two years, participants will prepare a list of safety guidelines intended for new instructors to use when preparing new courses. This session is planned for participants who teach laboratory courses.

Erica Suchman received her BA in biology from the University of California San Diego, and her Ph.D. in Molecular Biology and Biochemistry from the University of California, Irvine, where she worked on the role of retroviral promoters in pathogenesis and cellular tropism. Dr. Suchman is an associate professor of Microbiology at Colorado State University, and teaches general microbiology, general microbiology lab, virology and cell culture lab, and guest lecture in graduate and undergraduate virology.

Engaging Students in Undergraduate Research

Alix Darden, The Citadel
SATURDAY, MAY 22, 11:15 AM, NCF ROOM 130
SUNDAY, MAY 23, 9:45 AM, LRC ROOM 502

Engaging undergraduate students in research projects can be an extremely rewarding as well as extremely frustrating experience for both student and faculty advisor. Both faculty and students have many demands on their time. Research projects require a commitment of time and patience that often conflicts with these demands.
and students often get frustrated when experiments don’t work as expected. In this session, we will discuss how to provide rewarding undergraduate research experiences using examples and suggestions from the literature as well as personal experiences from the group.

Alix Darden is Associate Professor of Biology at The Citadel, Charleston, SC where she teaches Microbiology, Genetics, Immunology and Molecular Genetics. Her two areas of research focus on 1) development of abstract thinking in college students and 2) molecular biology of phototransduction in the salamander. As a Carnegie Scholar, 2001-2002, she studied how modeling activities impact on students’ abilities to think abstractly. She is also co-founder of The Citadel Academy for the Scholarship of Teaching, Learning and Evaluation, an inter-disciplinary, campus-wide program.

Extreme Halophiles: Models for Teaching Undergraduate Microbiology and DNA Microanalysis
Richard Shand, Northern Arizona University
SATURDAY, MAY 22, 11:15 AM, NCF ROOM 102
SUNDAY, MAY 23, 9:45 AM, LRC ROOM 501

Extremely halophilic (salt-loving) microorganisms are found in all three domains (Archaea, Bacteria and Eucarya) and thrive in hypersaline environments that are saturated or nearly saturated with salt (e.g., the Dead Sea and the Great Salt Lake). Moreover, they have been shown to survive inside of salt crystals that are dated to 250 million years! Haloarchaeons (extreme halophiles from the domain Archaea) are excellent models for teaching molecular microbiology and DNA microarray analysis as (i) they are interesting to students as they are “extremeophiles” (ii) they are easy to culture; (iii) cultures are not easily contaminated; (iv) cells are easily lysed liberating DNA, RNA and proteins; (v) mRNA half-lives are much longer than bacterial mRNA half-lives; (vi) they produce small, robust protein antibiotics (called “microhalocins”) that have been well characterized; (vii) they are easily recovered from surface salt deposits or from hypersaline brines; and (viii) the Halobacterium NRC-1 genome has been sequenced and microarrays have been made. An entire Molecular Techniques Laboratory course has been designed around haloarchaeons. Some of the laboratory experiments include: (i) resuscitation of novel extreme halophiles from samples from a nearby open-pit salt mine and characterization by amplification of 16S rDNA by PCR; (ii) partial purification of a microhalocin by gel filtration chromatography; (iii) cloning a microhalocin gene; (iv) correlation of microhalocin production and microhalocin transcript levels with growth physiology; and (v) designing and executing an experiment that compares two different physiological conditions or states (e.g., exponential growth vs. stationary phase) and comparing gene expression using DNA microarrays.

Richard Shand received his B.S. degree in Biological Sciences at the University of California–Davis. He then entered the Peace Corps and served as a secondary science teacher in Western Samoa for two years. Upon completion of his Peace Corps service, he earned his M.S. degree in Microbiology with Dr. David Carlberg at California State University–Long Beach, where he was introduced to and worked on extreme halophiles. He returned to U.C. Davis to earn his Ph.D. and, under Dr. Stan Arzt, studied regulation of the histidine biosynthetic operon in response to the alarmone ppGpp. Dr. Shand was a post-doctoral fellow at the University of California–San Francisco in Herb Boyer’s lab where he returned to extreme halophiles and studied the regulation of the bacterio-opsin gene cluster. He joined the faculty in the Department of Biological Sciences at Northern Arizona University in 1990, where he is currently a Professor of Microbiology. The main research focus in Dr. Shand’s lab is haloarchaeal gene expression using halocin genes as models. He has written the laboratory curricula for introductory microbiology, advanced cellular and molecular biology, and molecular techniques. His research on extreme halophiles is the foundation for the molecular techniques lab.

Fermentation and Active Learning Strategies
Robin Patterson, Butler County Community College
SATURDAY, MAY 22, 9:45 AM, NCF ROOM 102
SUNDAY, MAY 23, 9:45 AM, NCF ROOM 102

Using fermentation as an example, participants will employ ten simple active learning techniques that can be modified easily to teach a wide variety of concepts.

Robin Patterson has been teaching microbiology, anatomy & physiology, and biology at Butler County Community College for thirteen years. Over the years, her teaching style has evolved from teacher-centered to student-centered. Realizing that "Rome wasn’t built in a day", she shares her transformation with others through speaking engagements and workshops, encouraging educators to examine their teaching.
through the lens of educational theory and to make changes a little at a time. She also emphasizes the importance of collecting data to assess the effects those changes have made. Patterson’s presentations reflect her teaching style, involving a balance of lecture and audience participation. She shares the pedagogy and pedagogical content knowledge needed to effectively teach science and provides easy, practical activities to bring back to the classroom. Patterson is actively involved with the American Society for Microbiology as former chair of the Education Division, co-vice-chair of the 1999 Gordon Research Conference on Microbiology Education, and chair of the Committee for Precollege Education. In 2003 she received the Outstanding Faculty Educator Award at Butler County Community College.

Hidden in Plain Sight  
Betsey Dexter Dyer, Wheaton College  
SATURDAY, MAY 22, 9:45 AM, UC ROOM 205  
SATURDAY, MAY 22, 11:15 AM, UC ROOM 205

Bacteria are the most abundant and most diverse of all organisms on Earth but they are also the tiniest and thus are easily overlooked by the untrained (and unassisted) eye. Yet bacteria reveal themselves in a wide range of habitats including your own backyard. They can be recognized by their specific smells and flavors, colorful sediments, slimes and scums, and even sounds. Participants will learn to interpret and identify major groups of bacteria using field marks visible to the unaided eyes or other senses.

Betsey Dexter Dyer earned her PhD in the laboratory of Lynn Margulis at Boston University. For the last twenty years she has taught cell biology, genetics, and parasitology at Wheaton College in Norton, MA. She is the author of Tracing the History of Eukaryotic Cells (with husband, Robert Obar) and A Field Guide to Bacteria. Her research interests include symbiosis, with a focus on termite microbes, and genomic analyses of intergenic regulatory sequences.

Incorporating Math and Chemistry into Your Microbiology Course  
Judith Kandel, California State University – Fullerton  
SATURDAY, MAY 22, 9:45 AM, NCF ROOM 105  
SUNDAY, MAY 23, 9:45 AM, NCF ROOM 105

This session is planned for participants who wish to expand students’ understanding of microbial concepts by integrating underlying mathematical and/or chemical relationships. Emphasis will be placed on using the primary literature as a source of data to design active learning experiences that incorporate math and chemistry as they are applied in the profession.

Judy Kandel is a professor at California State University – Fullerton and teaches General Microbiology, Virology, and Biology of Sexually Transmitted Diseases with research interest in Microbiology education and assessment of student learning.

So You Want to Develop a Virtual Microbiology Laboratory Course?  
Michael Dennis, Montana State University – Billings  
Sue Merkel, Cornell University  
SATURDAY, MAY 22, 9:45 AM, LRC ROOM 502  
SATURDAY, MAY 22, 11:15 AM, LRC ROOM 502

Distance education, primarily in the form of correspondence courses, has been with us for decades. Now, online courses from traditional and online universities are the norm. Some institutions even offer entire degrees online. Should the sciences, with their hallowed hands-on laboratory exercises, be left out of ‘progressive’ education? If online education is not likely to disappear, then scientists should be responsible for development and delivery of online courses including virtual laboratory experiences to ensure their quality and validity.

In this session we will discuss the necessary components of a quality science laboratory experience. We will compare these characteristics in traditional and virtual labs and debate whether there is a legitimate place for virtual labs in the curriculum. We will also discuss various strategies to accomplish individual and institutional goals. We’ll conclude with a demonstration of an original virtual lab exercise. One of us (SM) has developed a series of web-based case studies that use the power of microscopy to explore current issues in microbial ecology and public health. The goal is to help students to better understand how the new microscopy techniques that are used in research have practical applications. We will present a case study on Cryptosporidium in the New York City Watershed and the SARS outbreak. We will discuss the development, implementation and evaluation of these case studies.

This session should be of interest to anyone who is currently teaching, or wishes to develop a virtual laboratory experience for students.
Michael Dennis received his Ph.D. from the Department of Microbiology at Colorado State University. His primary interests include infectious disease and cancer immunology. He has been on the faculties of Weber State University, the Primate Research Institute at New Mexico State University, and now Montana State University in Billings. Although he has always retained immunology as a primary focus, his work in New Mexico included work in toxicology (specifically carcinogenesis) and development of genetically engineered immunomodulators. Most of Dr. Dennis’ efforts in Montana are directed to teaching microbiology. His current research involves development of antimicrobial compounds that destroy biofilms and microbial spores. On a personal level, he enjoys good food and wine, good books and movies, good skiing, hiking and backpacking, and - above all - good fly-fishing.

Susan Merkel discovered microbiology as an undergraduate in the Department of Environmental Sciences at UNC-Chapel Hill. She did research for a while in microbial ecology, before going to Cornell University, where she received a M.S. in Microbiology. Sue is now a senior lecturer in Microbiology at Cornell. While most of her energy goes toward teaching the General Microbiology Lab and Lecture, she enjoys her involvement in undergraduate and graduate courses that help students learn how to teach. Over the years, Sue has developed a number of computer-based teaching tools. This interest led her to ASM, where she serves as Chair of the ASM MicrobeLibrary Visual Collection.

Student Incivilities
Terri Hamrick, Campbell University
SATURDAY, MAY 22, 9:45 AM, UC ROOM 205C
SUNDAY, MAY 23, 9:45 AM, UC ROOM 205C

Classroom incivilities are disruptive to learning, and their emotional impact can be devastating for both students and faculty. Whereas many have reported an increase in the incidence of incivilities in the classroom, the purpose of this session is not to debate whether or not rude behavior is actually on the rise. The goal of this session is to address faculty member’s concerns regarding incivilities in the classroom and provide realistic, practical solutions. It is easy to point a finger at students and say that they are “less respectful than they used to be”. However, the more important issue is that we as educators have a great influence over whether incivilities occur in our classrooms. In this session we will examine strategies for teaching and learning that can influence the occurrence of incivilities. We will discuss tactics to promote civility in the classroom and appropriately respond to incivilities in various educational settings. Additionally, we will examine examples of incivilities that are often encountered in academia and develop a plan of response. Faculty members need to be prepared to both prevent incivility and manage it when it happens. We are most vulnerable to incivilities when we are unprepared to deal with them.

Terri Hamrick earned a B.A. in Biology and Religious Studies from the University of Virginia, and a Ph.D. in Microbiology from the University of North Carolina at Chapel Hill. She completed a postdoctoral position at North Carolina State University in the laboratory of Dr. Paul Orndorff, where she began her studies on the pathogenesis of Listeria monocytogenes. She began her teaching career as a lecturer at the University of North Carolina at Chapel Hill where she taught medical microbiology to undergraduate students. She is currently an assistant professor in the School of Pharmacy at Campbell University. Her research effort at Campbell continues to focus on listerial pathogenesis, and she involves undergraduates in her research whenever possible. In addition to teaching medical microbiology and immunology to first year pharmacy students, she is active in promoting science education within the public school system. In conjunction with other faculty members, she leads laboratory workshops for middle school students, hosts middle school interns during the summer, and conducts workshops for public school teachers to encourage the incorporation of hands-on microbiology exercises into middle and high school science courses.

Fellowship Programs in Microbiology

ASM Undergraduate Research Fellowship
Encourages undergraduate students to conduct research in ASM members’ labs at their home institutions.

ASM Minority Undergraduate Research Fellowship
Encourages minority undergraduate students to conduct research in ASM members’ labs.

Both fellowships offer students the opportunity to present their work at the ASM General Meeting.