

Acknowledgments

The success of the *Base Pair* Summer Research Institute depends upon the hard work of a number of individuals. Foremost among these are Ms. Lisa McCammon, Department of Pharmacology and Toxicology and Ms. Rose Willis, School of Health Related Professions. The program is deeply indebted to their efforts.

The cover was developed by Mr. Cliff Leverette of the Department of Public Affairs, University of Mississippi Medical Center.

Large Background: In controlled drying experiments with high molecular weight calf thymus DNA, the liquid crystalline phases reach a maximum concentration of about 650 milligrams per milliliter, approximately the same density as observed in prokaryotic and viral genomes. The image above is a liquid crystalline DNA phase that reached the highest density observed with high molecular weight DNA. The DNA concentration for this specimen is approximately 600 milligrams per millimeter, and the magnification is approximately 150x. The digital image presented above was originally recorded on Fujichrome 64T transparency film using a Nikon Optiphot-Pol microscope with crossed polarized illumination. Exposures were recorded about 2.5 f-steps under the recommended value given by an in-camera photomultiplier and were push-processed approximately 1.5 f-steps in the first E-6 developer.

Small Insert - Left: One of the most beautiful photomicrographs in our DNA collection, this specimen displays a color transition from yellow to purple in the focal conic texture. Heavy striations also indicate that the specimen is approaching the concentrations observed in single crystals. The DNA concentration for this specimen is approximately 475 milligrams per millimeter, and the magnification is approximately 350x. The digital image presented above was originally recorded on Fujichrome 64T transparency film using a Nikon Optiphot-Pol microscope with crossed polarized illumination. Exposures were recorded about 2.5 f-steps under the recommended value given by an in-camera photomultiplier and were push-processed approximately 1.5 f-steps in the first E-6 developer.

Small Insert - Right: With striations that are beginning to resemble chevron patterns, this highly concentrated DNA specimen is probably a single crystal. The DNA concentration for this specimen is approximately 550 milligrams per millimeter, and the magnification is approximately 350x. The digital image presented above was originally recorded on Fujichrome 64T transparency film using a Nikon Optiphot-Pol microscope with crossed polarized illumination. Exposures were recorded about 2.5 f-steps under the recommended value given by an in-camera photomultiplier and were push-processed approximately 1.5 f-steps in the first E-6 developer.

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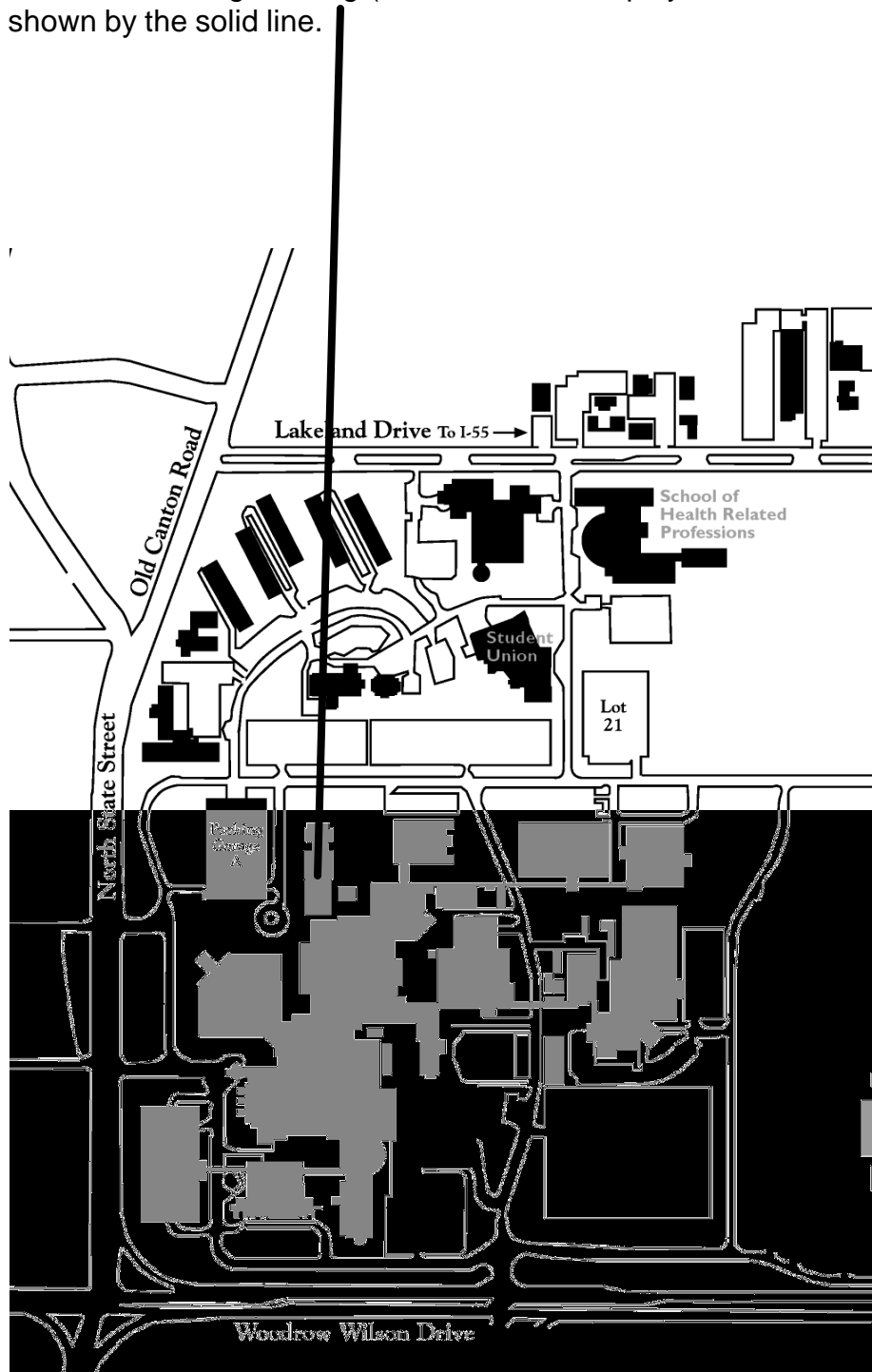
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UMC Campus Map

The School of Health Related Professions building, the Norman C. Nelson Student Union, parking lot 21 and the parking garage are identified.

The School of Nursing building (room A103 for employee orientation on Monday, June 16) is shown by the solid line.



**2003 *Base Pair*
Summer Teacher Training**

**June 16 – July 25
9:00 a.m. – 5:00 p.m.**

The ***Base Pair*** Program at the University of Mississippi Medical Center, with funding from the Howard Hughes Medical Institute, is sponsoring a 6-week program of laboratory training and curriculum development for middle and high school science teachers this summer. Each teacher will be “paired” with a UMC faculty member to mentor and assist the teacher in his/her professional development.

Program objectives include:

- 1) acquainting science teachers with modern skills in biological and chemical laboratory techniques, in a manner that will facilitate utilization in routine science courses;
- 2) familiarizing teachers with the fundamental knowledge required to incorporate www-based inquiry as an essential component of science teaching;
- 3) assisting teachers in the development and funding of specific, inquiry-based exercises that will be incorporated at their home schools.

A maximum of six (6) teachers will be selected to participate in the summer institute. Preference will be given, initially, to teachers from target high schools from the Jackson Public School District (JPSD), to teachers from other JPSD middle and high schools, and when appropriate, to personnel from other Jackson Metro area secondary schools. Selection criteria include a review of a **current resume**, a **letter that states how an applicant would apply the concepts of biotechnology and information technology within their classroom**, and a **personal interview** by Dr. Rob Rockhold, the Program Director.

The ***Base Pair*** program is committed to building the capacity of secondary schools in the Jackson Metro area to implement and sustain high-quality curricular and instructional programs for all students. Emphasis will, therefore, be on the selection of individuals who are proven academic leaders and have the initiative and willingness to work for implementation of the activities developed in the summer program.

An honorarium will be available.

If you are interested in participating in the *Base Pair* Summer Research Institute,

- **contact Dr. Rockhold by May 1, 2003, by phone (984-1634), by e-mail rockhold@pharmacology.umsmed.edu, and**
- **fax a current resume to 984-1637, attention Dr. Rob Rockhold.**

Program Description

The **Summer Research Institute at the University of Mississippi (UMC) School of Health Related Professions (SHRP)**. *Base Pair*, a biomedical research mentorship program, pairs faculty from the UMC with students and educators from the largest Mississippi public school system, the Jackson Public School District (JPSD). Initiated in 1992, *Base Pair* seeks also to meet an increasing demand for the teacher training that it provides in the area of laboratory-based science instruction in biology and chemistry. The primary objective is to establish a state-of-the-art laboratory science training facility at the UMC-SHRP (the **Summer Research Institute**) to enhance professional development of high school science teachers and stimulate inquiry-based science curriculum formulation. Teachers are recruited from programs directed toward the current *Base Pair* target site, Murrah High School, a second JPSD site, Jim Hill High School, and from other Jackson Metro area secondary schools. The impact of the **Summer Research Institute** is documented by continuation of a record of high school teacher presentation/publication of science research in professional scientific forums; submission by, and awarding of external education grants to, science teachers; adoption of a *Base Pair*-created science course, *Biomedical Research*, at high school sites; and utilization of laboratory activities fostered by **Summer Research Institute** graduates. Use of the inquiry-based course, *Biomedical Research* (Mississippi Department of Education Course Code 260502), by teachers is strongly encouraged. Research ethics, laboratory safety, electronic communications and information retrieval, grant writing and the use of contemporary popular literature about science and scientists as an integral resource for science teaching are actively promulgated.

The SHRP has provided access to a clinical laboratory science training facility for use by **Summer Research Institute** teachers. The space provided (Rooms SH149/259) includes approximately 1,840 ft² of bifunctional laboratory/classroom area with an additional 820 ft² of biotechnology preparatory laboratory space. These state-of-the-art laboratory facilities are designed specifically to teach biotechnology-oriented disciplines to clinical laboratory science professionals-in-training.

Objectives of the **Summer Research Institute** are to:

- 1) acquaint secondary school science teachers with modern skills in biological and chemical laboratory technique, in a manner that facilitates utilization in routine high school science courses. The skills include quantitative measurement and preparatory methods, centrifugation, use of preparatory and analytical chromatography (column and electrophoretic), sterile technique, microbiological culture, and protein analysis.
- 2) familiarize teachers with the fundamental knowledge required to incorporate web-based inquiry, by students, as an essential component of science teaching.
- 3) assist teachers in the development, and funding, of specific, inquiry-based, exercises that will be incorporated at their home schools. To the maximum extent possible, exercises are structured around simple, low-cost, commercially available biotechnology-oriented kits. Training in writing of proposals for funding of such activities for independent classroom use is provided and teachers are expected to prepare and submit a proposal as an outcome of the summer training.
- 4) propose web-based mechanisms by which teachers can communicate with one another, and have the ability to readily access biomedical expertise, information and equipment resources during the school year, and
- 5) promulgate adoption of the course, *Biomedical Research*, at each teacher's home school.

The program will take place within the SHRP research/teaching laboratory building, from 9:00 a.m. to 5:00 p.m., 5 days/week, during the summer of 2003. An overarching theme for participating teachers will be self-evaluation, with the goal of refreshing and enhancing classroom instruction. The use of the Myers-Briggs Type Indicator (MBTI) and other professional evaluation instruments and techniques will assist in this self-evaluation process, guided by a licensed clinical psychologist, Susan Neral, Ph.D., a Program Co-Investigator. Mornings will be devoted to didactic lectures in the biology and chemistry required to teach modern, biotechnology-oriented science curricula and practical training in safety, electronic communications, biomedical information retrieval, and professional skills development. Teachers will be familiarized with the objectives, design and implementation of inquiry-based learning using *Biomedical Research* as the model. A detailed reading list has been prepared of books that identify and present science, particularly relating to contemporary biomedicine and bioterrorism, in interesting, and informative ways. These include two books by the science journalist, R. Preston, including the best-selling depiction of exposure to Ebola and Marburg viruses (*The Hot Zone*, 1995), and *The Demon in the Freezer* (2002), a story of the science behind the smallpox virus; *Scourge: The Once and Future Threat of Smallpox* (J.B. Tucker, 2001), an examination of the history, ecology and biology of this disease, and *Germs: Biological Weapons and America's Secret War* (J. Miller, S. Engelberg and W. Broad, 2001). In addition, the video, *Medicine Man*, starring Sean Connery, that fictionalizes discovery of a unique anticancer drug in the endangered Amazonian rain forest, will be shown. This video will set the stage for a laboratory exercise in which teachers will participate. Based on presentations, by trainees, of these examples, one session/week (of the last 5 weeks) will be devoted to group discussions of the perception of scientists by the lay public, by themselves, and by students. This forum will be used to present discussion concerning ethics in science and encourage teachers to utilize similar material in teaching efforts in their home schools. Afternoon sessions will be laboratory-oriented, with emphasis being placed on development of quantitative laboratory skills and acquiring familiarity with selected kit-based biotechnology laboratory exercises. These latter exercises will be focused on BioTechnology Explorer™ kits developed by Bio-Rad Laboratories in conjunction with the San Francisco Bay Area Biotechnology Education Consortium, <http://www.explorer.bio-rad.com>. Several of these kits have been tested by **Base Pair** teachers, and are being used in Murrah High School. One such kit formed the basis for a successful grant application by a **Base Pair** teacher. The kits are inexpensive (generally less than \$100/kit), serve groups of 8-10 students each, are extremely well documented, and dramatically capture the interest of teachers and students alike. These, more than any other single strategy tested by **Base Pair**, seem to fulfill existing needs of secondary science teachers. The low cost will enable teachers and districts to realistically maintain usage when **Base Pair** support ceases. A considerable component of the summer training will be in grantsmanship, with the expectation that **Summer Research Institute** alumni will be able to gain external funds to support the use of such kits at their home schools. Again, experience from the existing **Base Pair** activities indicates that this is a very realistic expectation. Participants will engage in two web-based e-learning courses; one of which (LabMath) is a tutorial for health professions-related mathematics skills, the other of which is formatted using a commercially available e-learning software platform (www.blackboard.com) and which provides instruction in assessment of information resources. Faculty mentors who will participate in the teaching program include A. Haaland, M.L.S. (Assist. Professor, Academic Information Services, Rowland Medical Library), L. McDaniel, Ph.D. (Assoc. Professor, Microbiology), S. Neral, Ph.D. (Assistant Prof., Psychiatry and Human Behavior, Co-Director of the UMC Office of Academic Counseling and **Program Co-Investigator**) R. Rockhold, Ph.D. (**Program Director**; Professor, Pharmacology & Toxicology), L. Spence, Ph.D. (Assoc. Professor, SHRP), D. Sullivan, Ph.D. (Assoc. Professor, Medicine and **Program Co-Investigator**), and T. Wiggers, M.S. (Assoc. Professor, SHRP).

Parking will be available at no cost on campus (details to be provided).

University of Mississippi Medical Center Participants

Summer Research Institute Oversight Committee

Dr. David Fowler is Chairman of the Department of Clinical Laboratory Sciences in the School of Health Related Professions at UMC. He holds a Ph.D. in Information Systems and Quantitative Sciences from Texas Tech University and has held administrative and teaching positions at Texas Tech University, the University of Southern Mississippi, and UMC. He has been awarded a variety of citations for Scientific Creativity, Service, Achievement and Excellence in Teaching.

Ms. Janis Quinn serves as the Associate Director of the Department of Public Affairs at UMC and has a distinguished record of accomplishment in Public Affairs and news reporting. She is the author of several important publications, including the book, *Arthur C. Guyton: His Life, His Family, His Achievements*, Oakdale Press, Jackson, MS, 1989.

Ms. Ada Seltzer is the Chair of the Department of Academic Information Services and Director of the Rowland Medical Library at UMC. She holds an M.S. in Library Science from Florida State University and an M.A. in Community College Education from the University of South Florida. She has been awarded numerous grants to develop and disseminate library-based information resources in technologically-oriented and innovative ways. She was awarded a Phil Hardin Foundation Award for Innovative Uses of Computer Technology in 1996.

Faculty mentors

Faculty mentors who will participate in the Summer Research Institute teaching program include A. Haaland, M.L.S. (Asst. Professor, Academic Information Services, Rowland Medical Library), L. McDaniel, Ph.D. (Assoc. Professor, Microbiology), R. Rockhold, Ph.D. (Program Director; Professor, Pharmacology & Toxicology), S. Neral, Ph.D. (Asst. Professor, Psychiatry and Human Behavior, Co-Director of the UMC Office of Academic Counseling, and D. Sullivan, Ph.D. (Assoc. Professor, Medicine).

Ms. Haaland serves as a reference information research professional in the Rowland Medical Library, and has a primary responsibility for training over 500 medical and health-related personnel in biomedical information technology and retrieval each year. She has served as a major training resource in this capacity for the **Base Pair** program since 1993.

Dr. Neral maintains an active practice in Clinical Psychology and serves as Co-Director of the Office of Academic Counseling for the Medical Center campus. She has served as a **Base Pair** mentor for numerous high school students over the past decade.

Dr.'s McDaniel and Sullivan both maintain active research laboratories, in conjunction with extensive teaching responsibilities, within their respective departments of the medical school. Both have participated as mentors in the existing **Base Pair** program since its inception.

Other Participants

Including the individuals listed above, close to two dozen faculty and staff from the University of Mississippi Medical Center Schools of Medicine, Nursing, Dentistry and School of Health Related Professions will participate in teacher training activities. Those not previously mentioned include:

O. Allen, D.N.S.	T. Dellinger, Ph.D.	L. Serpa
R. Black, Ed.D.	S. Douglas, M.D.	L. Spence, Ph.D.
D.T. Brown, Ph.D.	S. Elkins, M.D.	T. Thigpen, M.D.
S.T. Case, Ph.D.	R.E. Lewis, Jr., Ph.D.	T. Tonore, M.D.
M. Coburn	J.C. Meade, Ph.D.	S. Wellman, Ph.D.
B. Couch, Ph.D.	S.M. Neral, Ph.D.	R. Vishwanatham
K. Crews, D.M.D.	S. Nolan, M.D.	T.B. Wiggers, M.S.

Teacher Resources to be Provided to Participants Free of Charge

- 1) Textbook: *Molecular Biology Made Simple and Fun:* Clark, D.P. and Russell, L.D., Cache River Press, Vienna, IL, 1997.
"Written primarily for the science student, but suitable for the non-scientist, the reader will gain a solid understanding of the fundamentals and tools of molecular biology. The book also details how this rapidly advancing field has and will continue to have and impact on health, law, agriculture, biotechnology and our understanding of the origins of the species."
- 2) CD-ROM: HyperCELL 1998: Williams, G., Garland Publishing, 1997.
"A powerful cell biology learning program with over 275 animated diagrams. Easy-to-follow animated diagrams illuminate and clarify kinetic cellular processes that are otherwise difficult to grasp."
- 3) 3-Ring binder and laboratory notebook:
- 4) Reading/Video material on using literature about science:
 - A. *The Hot Zone.* Preston, R., Anchor Books, New York, NY, 1995.
 - B. *Scourge: The Once and Future Threat of Smallpox.* Turner, J.B., Atlantic Monthly Press, 2001.
 - C. *The Demon in the Freezer: A True Story.* Preston, R., Random House, New York, NY, 2002.
 - D. *Germs: Biological Weapons and America's Secret War.* Broad, W., Miller, J., Engelberg, S., Touchstone Books, 2002.
 - E. *The Medicine Man.* VHS format, Hollywood Pictures, 1992.
- 5) Curriculum Material:
 - A. Career planning for the health sciences
 - B. Grant writing for high school teachers
 - C. Research and medical ethics
 - D. Laboratory safety
 - E. Science curriculum development
 - F. Use of Internet and medical library resources for science teaching
 - G. Laboratory mathematics – on-line tutorial
 - H. Introduction to molecular biology
 - I. Biotechnology laboratory kit use in the classroom
 - J. Drug abuse and health care information
- 6) Biotechnology Explorer Laboratory Kits:
Sets of 5 biotechnology oriented laboratory experiment kits, enough to serve a class of 25, available for classroom use during the academic year
- 7) Grant Application Program:
An opportunity to prepare individual, teacher-initiated grant proposals for funding of classroom activities.

Outcome Expectations for Participants

The overarching purpose for the *Base Pair* Summer Research Institute is to enhance the opportunities for science learning in the Jackson Metro area, utilizing the resources of the University of Mississippi Medical Center to foster incorporation of contemporary, laboratory-based and inquiry-oriented activities as the primary means to enhance learning. Having stated that as the objective, attention must next be focused on determination of the degree to which the program achieves that goal. Accordingly, a series of specific, task-oriented outcomes has been selected that participants are directed to address. Pursuit of these outcomes has distinct educational value within the context of the principal objective and provides measures that can be easily quantified. The outcomes that each participant is asked to accomplish are:

- Completion of the tasks identified in the **Personal Professional Philosophy Development Plan** (described below) , including,
 - Enumeration of personal learning objectives.
 - Listing behaviors/activities describing leadership qualities in education.
 - Formulation of methods to measure your success in enhancing personal leadership skills.
 - Description of lesson plan involving one or more activities generated from Summer Research Institute training, including evaluation of the effectiveness of that lesson plan.
- Preparation of a **teacher-initiated application for funding** from a granting agency of the participant's choice. Submission of the application will be coordinated by the Program Director. Participants will be asked to notify the Program Director of the final decision concerning funding of the application.
- Active participation in **weekly discussion of science-related literature**.
- Submission of **evaluation instruments** throughout the course of the program, including the
 - Myers-Briggs Type Indicator.
 - Pre- and post-program evaluations.
 - Exit interview with Program Co-Investigator.
 - University of Mississippi Medical Center Continuing Education evaluation form.

Development Plan

Personal Professional Philosophy

One of the most intellectually stimulating activities engendered by participation in programs sponsored by the Howard Hughes Medical Institute Precollege Science Education Initiative has been the development of methods for evaluation of the impact generated by individual sponsored programs. In order to do so, each Program Director underwent a process requiring us to rigorously articulate both the objectives he or she desires for their program and specific outcomes that would determine the degree to which those objectives are met. As a part of that process, it was necessary to review critically the arguments (need) for such a program, the facilities already available, additional resources that would be needed, and the impact anticipated on the local educational environment. Because this process has proven to be so valuable, you are being asked to engage in a similar activity, which can aptly be called enunciation of your individual philosophy towards education, career development and commitment to pursuit of teaching excellence.

The most important requirement for development of such a statement will be for you to devote a period of time for consideration of your attitudes and expectations with regard to these issues. It is for this reason that we ask you to prepare this worksheet prior to the first session of the summer program. Each of you will be expected to revisit, refine and reformulate this statement both during the program and, hopefully, throughout your future career. As this is intended as a personal manifesto, it is important for you to decide, and then clearly state, what you expect your goals to be and how you will measure their impact. You will be introduced to additional criteria for evaluation and standards to which contemporary educators can expect to be held during the program, which may help you shape your final document. Initially, however, you must create the foundation for a personal professional philosophy.

Your initial assignment will be to prepare a written response to items 1.a. and 2.a. and bring that with you on June 16th. If you wish, these may be prepared as Microsoft Word documents and e-mailed to me prior to that date at rockhold@pharmacology.umsmed.edu. They can also be faxed to me at 984-1637. If you do not have access to word processing/internet capability, you can use our facilities on campus to format your responses after the course has begun. You will be expected to complete the remaining questions and submit responses upon conclusion of the summer program.

1. Personal learning objectives

- a. Attempt to identify specifically why you chose to join this program. If it is to gain didactic content or laboratory ("hands-on") skills, outline or summarize the scope/detail that you realistically expect to carry with you upon completion of the program. You may wish to consider this in the form of test questions that you anticipate being able to answer at the end of the six-week sequence. Remember, the idea is to challenge yourself to achieve, with our guidance, realistic, attainable and quantifiable outcomes.

2. Personal career goals in education

- a. Consider the question "What constitutes leadership in education?". In doing so, first enumerate activities or behaviors that are demonstrated by classroom teachers whom you would consider educational leaders. Second, identify those characteristics that are common to all whom you view as educational leaders. Neither list need be expansive, but should summarize those attributes about which you feel most strongly.
- b. Identify, within the context of your lesson plan(s) for the 2003-2004 academic year, when, where and how you will incorporate one or more of the activities, behaviors or characteristics you have just listed.

- c. At the end of the 2003-2004 academic year, how will you measure the extent to which you have achieved this goal or goals?

3. Plan for incorporation of learned activities in daily classroom program

- a. Exposure to contemporary concepts of and activities in bioscience is meaningless unless the results translate into measurable enhancement of classroom learning. It is important to this program that we be able to document, for student learning, where, when and how you plan to incorporate one or more of the hands-on laboratory activities in your classroom during the upcoming academic year.
- b. Begin to develop a written plan through which you will measure the impact of such an activity or activities. These must take the form of observable demonstrations of future learning by your students.
- c. Previous participants in this program have suggested that a principal reason why “hands-on” laboratory activities and (to a lesser degree) incorporation of inquiry-based learning strategies are not used in the classroom is because they “detract from time needed to prepare for standardized exams” and “do not help meet required curriculum standards”. For each activity that you plan to incorporate, detail which curriculum standards that activity will fulfill.

Weekly Schedule

A. Week 1 – June 16-20: "A Contemporary Tool Kit for Bioscience"

Didactic section – Purpose:

1. The tools of modern molecular biology
2. Introduction to inquiry-based curriculum design
3. Introduction to granting (supporting your own teaching)
4. Introduction to web-based teaching using Blackboard

Laboratory section - Purpose:

1. General orientation
2. Introduction to needed laboratory techniques
 - a. Lab safety
 - b. Research ethics and note-keeping
 - c. Wet chemistry accuracy and precision
 - d. Pipetting skills
 - e. Protein concentration determination
 - f. Gel electrophoresis
 - g. Sterile culture

Friday literature of science section – Purpose:

1. Using literature to promote science learning
2. Introduction to reading list
3. Choice of weekly assignments

B. Week 2 – June 23–June 27: "Things That Bite Back"

Didactic section – Purpose:

1. Infectious diseases, parasites, travel medicine
2. Preliminary selection of teacher-initiated mini-grant proposals
3. Background information on bacterial transformation
4. Using computer-based biomedical information sources

Laboratory section - Purpose:

1. Biotechnology Explorer Kit/Bacterial Transformation - the pGLO system
2. Introduction to HyperCELL 98/Virtual Labs

Friday literature of science section – Purpose:

1. Presentation and discussion of "The Hot Zone"

C. Week 3 – June 30-July 4 (Friday, July 4 = Holiday): "Sippin', Snortin' and Swappin'"

Didactic section – Purpose:

1. The pharmacology of drug abuse
2. Purpose and use of library information resources
3. Blood banking, tissue typing and transplantation

Laboratory section - Purpose:

1. Biotechnology Explorer[®] Kit/DNA Fingerprinting

Friday literature of science section – Purpose:

1. Presentation and discussion of *“Scourge: The Once and Future Threat of Smallpox”*.

D. Week 4 – July 7-11: “Machining People”

Didactic section – Purpose:

1. Introduction to cell biology
2. Professional biomedical careers orientation
3. Cloning and paternity testing

Laboratory section - Purpose:

1. Biotechnology Explorer[®] Kit/Chromosome 8 PCR

Friday literature of science section – Purpose:

1. Presentation and discussion of *“The Demon in the Freezer”*

C. Week 5 – July 14-18: “Cancer – When Things Go Wrong”

Didactic section – Purpose:

1. Carcinoma: recognition, prevention, treatment and outcome
2. Grantsmanship

Laboratory section - Purpose:

1. Biotechnology Explorer[®] Kit/Secrets of the Rain Forest

Friday literature of science section – Purpose:

2. Presentation and discussion of the video, *“Medicine Man”*

D. Week 6 – July 21-25: “Ethics of Science and Medicine”

Didactic section – Purpose:

1. Practical applications and ethical implications of biotechnology/molecular biology
2. Presentation of finished grant proposals

Laboratory section - Purpose:

1. Biotechnology Explorer[®] Kit/Protein Fingerprinting Kit

Friday literature of science section – Purpose:

3. Presentation and discussion of *“Germs: Biological Weapons and America’s Secret War”*

Week 1 – June 16-20: “A Contemporary Tool Kit for Bioscience”

<u>TIME</u>	<u>TOPIC</u>	<u>FACULTY</u>	<u>LOCATION</u>
<u>Monday</u>			
8:00-11:00	MANDATORY UMC NEW EMPLOYEE ORIENTATION	UMC Staff	A102
11:30-1:30	Luncheon- Meet former participants, and Introduction: <i>Base Pair</i> and the Summer Research Institute	Rockhold Nelson Student Union	
1:30-2:20	MANDATORY COMPLIANCE TRAINING	UMC Staff	S123
2:30-3:20	Pre-course Evaluation	Neral	U172
3:30-4:20	Orientation to Rowland Medical Library	Vishwanatham	Library
<u>Tuesday</u>			
9:00-10:50	Student-Oriented Academic Research (SOAR): The High School Laboratory as an Academic Centerpiece	Rockhold/ Bender	SH149
11-11:50	Grantsmanship #1– Supporting your Own Curriculum (Orientation to Developing Projects for Grant Proposals)	Rockhold	SH149
12:00-1:30	Lunch		
1:30-4:20	Hazards in High School Laboratories/ Development of a Hazard Plan/ Introduction to Laboratory Safety	SHRP Staff- Fowler, Spence	SH259
<u>Wednesday</u>			
9-10:50	Introduction to LabMath	Wiggers	SH196
11-11:50	Myers-Briggs MBTI Test	Neral	SH149
12-1:30	Lunch		
1:30-2:20	Laboratory Techniques: Pipetting, Accuracy, Precision	SHRP Staff	SH259
2:30-3:20	Laboratory Techniques: Basic Chemistry (Molarity, w/w, w/v, v/v, etc.)	SHRP Staff	SH259
3:30-4:20	Laboratory Techniques: Sterilization (Autoclave vs. Sterile filtration)	SHRP Staff	SH259
<u>Thursday</u>			
9-9:50	Introduction to Biotechnology	Sullivan	SH149
10-10:50	Introduction to Biotechnology, Continued	Sullivan	SH149
11-11:50	Restriction Enzymes and Cloning	Sullivan	SH149
12-1:30	Lunch		
1:30-2:20	Laboratory Practicum: Using What You Forgot	SHRP Staff	SH259
2:30-4:20	Protein Determinations (2 hrs)	SHRP Staff	SH259
<u>Friday</u>			
9-9:50	Polymerase Chain Reaction (PCR) and Microarrays	Sullivan	SH149
10-10:50	Bioengineering a New Antibiotic	Sullivan	SH149
11-11:50	Introduction to Blackboard – Information Need and Research Process	Vishwanatham	SH196
12-1:30	Lunch		
1:30-3:20	Gel Electrophoresis: A Laboratory Demonstration of DNA/RNA, Protein, and Sequencing Rigs	Sullivan	N503
3:30-4:20	Biotechnology Explorer: <i>Genes in a Bottle</i> kit	Sullivan	N503

Week 2 – June 23-June 27: “Things That Bite Back”

<u>TIME</u>	<u>TOPIC</u>	<u>FACULTY</u>	<u>LOCATION</u>
<u>Monday</u>			
9-9:50	Introduction to Microbes	Sullivan	SH149
10-10:50	Essentials of Antimicrobial Therapy	Sullivan	SH149
11-11:50	Regulating Biohazards	Case	SH149
12-1:30	Lunch		
1:30-3:20	Bacterial Culture Plate Preparation (2 hrs)	Sullivan	N503
3:30-4:20	Overview of <i>Bacterial Transformation</i> Kit: Set up Plates	Sullivan	N503
<u>Tuesday</u>			
9-9:50	Emerging Infections	Sullivan	SH149
10-10:50	West Nile Virus	Sullivan	SH149
11-11:50	SARS (Severe Acute Respiratory Syndrome)	Sullivan	SH149
12-1:30	Lunch		
1:30-2:20	Introduction to HyperCELL 98/Virtual Labs	Rockhold	SH196
2:30-4:20	<i>Bacterial Transformation</i> Kit: Day 1	Rockhold/Sullivan	N503
<u>Wednesday</u>			
9-9:50	Curriculum Design – Using Biotechnology as a Tool	Rockhold	SH149
10-10:50	Mad Cows and Englishmen	Sullivan	SH149
11-11:50	Origin of HIV	Sullivan	SH149
12-1:30	Lunch		
1:30-2:20	Travel Medicine	Nolan	SH149
2:30-4:20	<i>Bacterial Transformation</i> Kit: Day 2	Rockhold/Sullivan	N503
<u>Thursday</u>			
9-9:50	OPEN		
10-10:50	Parasites: Don't Drink the Water	Meade	SH149
11-11:50	Bioterrorism	Sullivan	SH149
12-1:30	Lunch		
1:30-4:20	Grantsmanship #2– Supporting your Own Curriculum (Preliminary Review of Projects for Grant Proposals)	Rockhold	SH149
<u>Friday</u>			
9-9:50	Blackboard – Lesson #2: Information Organization	Vishwanatham	SH196
10-10:50	Fungus Among Us	McDaniel	SH149
11-11:50	OPEN		
12-1:30	Lunch – Book Discussion “ <i>The Hot Zone</i> ”	Rockhold	SH149
1:30-4:20	Analytical Toxicology – Urine Drug Screen Demonstration	Hume	R402

Week 3 – June 30- July 4: “Sippin’, Snortin’ and Swappin’”

FRIDAY WILL BE A HOLIDAY

<u>TIME</u>	<u>TOPIC</u>	<u>FACULTY</u>	<u>LOCATION</u>
<u>Monday</u>			
9-9:50	Transplantation: The Bone Marrow Experience	Coburn	SH149
10-10:50	Ethical and Moral Issues in Transplantation	Bigelow	SH149
11-11:50	Blackboard – Lesson #3: Information Storage and Retrieval in the Electronic Age	Vishwanatham	SH196
12-1:30	Lunch		
1:30-4:20	<i>DNA Fingerprinting Kit</i> – Overview and Day 1	Sullivan	N503
<u>Tuesday</u>			
9-11:50	Myers-Briggs Evaluation Discussion	Neral	SH149
12-1:30	Lunch		
1:30-2:20	<i>DNA Fingerprinting Kit</i> –Day 2	Sullivan	N503
2:30-3:45	MisHIN – Mississippi Health Sciences Information Network	Serpa	U117
<u>Wednesday</u>			
9-10:50	Grantsmanship #3– Supporting your own Curriculum (Present/Review Outline of Grant Proposal)	Rockhold	SH149
11-11:50	The Cell: The Basic Model (preface to Week 4, “ <i>Machining People</i> ”)	Brown	SH149
12-1:30	Lunch- Book Discussion “ <i>Scourge: The Once and Future Threat of Smallpox</i> ”	Rockhold	SH149
1:30-4:20	<i>DNA Fingerprinting Kit</i> –Day 3	Sullivan	N503
<u>Thursday</u>			
9-9:50	Drug Abuse – Stimulants/Hallucinogens	Rockhold	SH149
10-10:50	Drug Abuse – Anabolic/Androgenic Steroid Abuse	Rockhold	SH149
11-11:50	Drug Abuse – Opioids/Sedative-Hypnotics	Rockhold	SH149
12-4:20	OPEN		

FRIDAY IS A HOLIDAY

Week 4 – July 7-11: “Machining People”

TIME	TOPIC	FACULTY	LOCATION
<u>Monday</u>			
9-9:50	HHMI Holiday Lecture DVD Project	Rockhold	SH149
10-10:50	Cell Differentiation: What is a Stem Cell Anyway?	Couch	SH149
11-11:50	Allied Health Careers – Orientation	Fowler	SH149
12-1:30	Lunch- The Sociology of Science - “Scourge: The Once and Future Threat of Smallpox”	Rockhold	SH149
1:30-4:20	Chromosome 8 PCR Kit: Day 1	Sullivan	N503
<u>Tuesday</u>			
10-10:50	Pathway to Medical School	Case	SH149
11-11:50	Myers-Briggs Evaluation discussion	Neral	SH149
12-1:30	Lunch		
1:30-4:20	Chromosome 8 PCR Kit: Day 2	Sullivan	N503
<u>Wednesday</u>			
9-9:50	Cloning for Fun and Profit	Wellman	SH149
10-10:50	Gene Therapy: More Than What Mom and Dad Gave You	Wellman	SH149
11-11:50	Careers in Dentistry – Orientation	Dellinger	SH149
12-1:30	Lunch		
1:30-4:20	Chromosome 8 PCR Kit: Day 3	Sullivan	N503
<u>Thursday</u>			
9-9:50	Preventing Tobacco Use by Adolescents: What is the Educator’s Role?	Crews	SH149
10-10:50	Poster Presentation Skills	Schenk	SH149
11-11:50	Careers in Nursing – Orientation	Allen	SH149
12-1:30	Lunch		
1:30-2:20	Blackboard – Lesson #4: Critical Thinking Skills/Database and Funding Sources on the Web	Vishwanatham	SH196
2:30-3:20	Blood Banking: Should You Store Your Own?	Spence	SH149
3:30-4:20	Tissue Typing: One Size Does Not Fit All	Spence	SH149
<u>Friday</u>			
9-11:50	Final Presentation of MBTI Results	Neral	SH149
12-1:30	Lunch - Book Discussion “Demon in the Freezer: A True Story”	Rockhold	SH149
1:30-4:20	Behind the Scenes: Research at the Mississippi Museum of Natural History	Trip to Museum	

Week 5 – July 14-18: “Cancer: When Things Go Wrong”

TIME	TOPIC	FACULTY	LOCATION
<u>Monday</u>			
9-9:50	Cancer: “The Great Scourge?”	UMC Oncology	SH149
10-10:50	Cancer: “What Does it Look Like?”	UMC Oncology	SH149
11-11:50	Cancer: “Can We Prevent It?”	UMC Oncology	SH149
12-1:30	Lunch		
1:30-4:20	<i>Secrets of the Rain Forest Kit: Day 1</i>	Sullivan	N503
<u>Tuesday</u>			
9-9:50	OPEN		
10-10:50	Biochemistry of Cancer: What is Transformation?	Wellman	SH149
11-11:50	Biochemistry of Cancer: What is Transformation?	Wellman	SH149
12-1:30	Lunch		
1:30-4:20	<i>Secrets of the Rain Forest Kit: Day 2</i>	Sullivan	N503
<u>Wednesday</u>			
9-9:50	Managing Cancer: Surgical Options and Risks	UMC Oncology	SH149
10-10:50	Managing Cancer: Radiation Options and Risks	UMC Oncology	SH149
11-11:50	Managing Cancer: Chemotherapy Options and Risks	UMC Oncology	SH149
12-1:30	Lunch		
1:30-4:20	<i>Secrets of the Rain Forest Kit: Day 3</i>	Sullivan	N503
<u>Thursday</u>			
9-11:50	Curriculum Design – Using Biotechnology as a Tool	Rockhold	SH149
12-1:30	Lunch		
1:30-4:20	<i>“Medicine Man” – The Video</i>	Rockhold	SH149
<u>Friday</u>			
9-9:50	Mississippi and the Abuse of Drugs: MS Bureau of Narcotics		SH149
10-10:50	Group Discussion of <i>“Medicine Man”</i>	Rockhold	SH149
11:00-11:50	Grantsmanship #5– Supporting your own Curriculum (Refinement and Budgeting of Grant Proposal)	Rockhold	SH149
12-1:30	Lunch		
1:30-4:20	Grantsmanship #5 cont’d– Supporting your own Curriculum (Refinement and Budgeting of Grant Proposal)	Rockhold	SH149

Week 6 – July 21-25: “Ethics of Science and Medicine”

<u>TIME</u>	<u>TOPIC</u>	<u>FACULTY</u>	<u>LOCATION</u>
<u>Monday</u>			
9-9:50	Molecular Biology: On the Bright Side Better Medicine, Better Plants and Animals	Panel (Sullivan/Rockhold/Black)	SH149
10-10:50	Molecular Biology: On the Dark Side, Better Weapons, Less Privacy, More Restrictions	Panel	SH149
11-1:30	Lunch with Mentors		
1:30-4:20	<i>Protein Fingerprinting Kit: Day 1</i>	Sullivan	N503
<u>Tuesday</u>			
9:00-11:50	<i>Protein Fingerprinting Kit: Day 2</i>	Sullivan	N503
12-1:30	Lunch		
1:30-2:20	Research Ethics – Case Studies and Role playing	Rockhold	SH149
2:30-4:20	Medical Ethics (2 hr)	Douglas	SH149
<u>Wednesday</u>			
9-11:50	Grantsmanship #6– Supporting your own Curriculum (Identify Evaluation Process for Grant Proposal)	Rockhold	SH149
12-1:30	Lunch		
1:30-4:20	<i>Protein Fingerprinting Kit: Day 3</i>	Sullivan	N503
<u>Thursday</u>			
9-10:50	Curriculum Design – Using Biotechnology as a Tool <i>“Biomedical Research”</i>	Cook	SH149
11:00-11:50	Paternity Testing and Forensic Pathology	Lewis	SH149
12-1:30	Lunch – Book Discussion <i>“Germs: Biological Weapons and America’s Secret War”</i>	Rockhold	SH149
1:30-4:20	Sexual Health and the High School Teacher	Tonore	SH149
<u>Friday</u>			
9-11:50	Grantsmanship #7 Supporting your own Curriculum (Final Editing of Grant proposal)	Rockhold	SH149
12-1:30	Luncheon Banquet	Rockhold	G301
1:30-4:20	Final evaluation and networking planning	Rockhold	G301