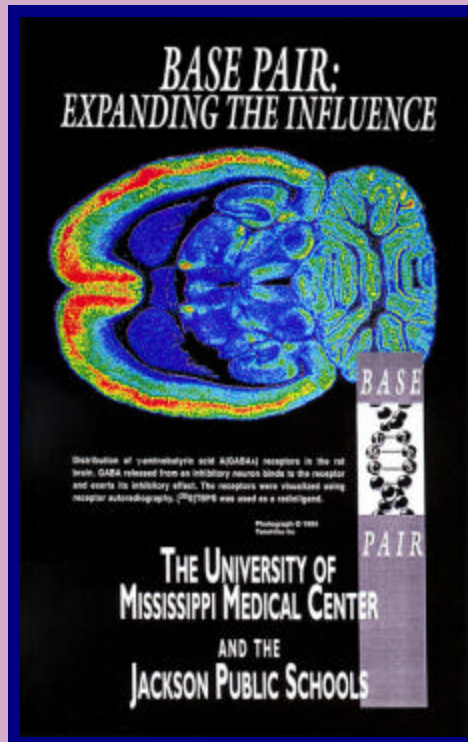


Base Pair

Handbook and Orientation Manual



Second Edition
Academic Year 2003-2004

R.W. Rockhold, Ph.D.
Program Director

Dedication

This manual is dedicated first and foremost to those who have received the least attention for their unflagging efforts in support of *Base Pair*, but without whom the program would be sorely lacking. The administrative professionals of the Department of Pharmacology and Toxicology, Pam Banks, Lisa McCammon, Margaret Nicholas, and Ann Pace, have been indispensable to the success of *Base Pair* and sincere appreciation is extended to them for their energy, initiative and good cheer in the face of often massive work loads.

Recognition must also be accorded to the numerous individual mentors, whose time, diligence, patience, intelligence and compassion have afforded *Base Pair* the national recognition that it enjoys today.

Finally, thanks must be given the highest levels of the University of Mississippi Medical Center administration, for the visionary and continued support of *Base Pair*.



“Picturing DNA” from <http://www.geneart.org-genome-title.htm>

Base Pair

Handbook and Orientation Manual

This manual was prepared as a guide to mentors, teachers, students, and parents who are involved in the *Base Pair* program. Mentoring is a difficult avocation, but one that is inherent in the philosophy of all scientists, and one that can bring enormous satisfaction to those who have the opportunity to observe the growth and development of their protégés. The information offered in this booklet is drawn from many sources, including prominently the “Project SEED – *Student, Mentor and Coordinator Handbook*” developed by the American Chemical Society (www.acs.org/education/SEED.html). It incorporates many of the guidelines espoused in the document “Mentoring: Elements of Effective Practice” (http://www.mentoring.org/framesets/frmset_resources.html), produced by the National Mentoring Working Group convened by the United Way of America and The National Mentoring Partnership.

The intent is to allow individuals wishing to participate in the *Base Pair* to have access to nationally accepted “best practices” related to mentorship activities.

Base Pair

Mission Statement

“To utilize the intellectual excitement inherent in a University Medical Center setting as an impetus for professional advancement of high school students and educators, as well as serving as a model for invigoration of secondary school science education.”

Visit *Base Pair* at <http://basepair.library.umc.edu/>

Table of Contents

Dedication	2
Preface and mission statement	3
Table of contents	4
What is Base Pair ?	5
What has Base Pair accomplished?	6
a. Base Pair scientific citations	6
b. Base Pair Web site	9
c. Newsletter, <i>Telemachian Notes</i>	10
d. Academic course, <i>Biomedical Research</i>	10
e. Teacher grants	10
f. Student Oriented Academic Research (SOAR)	11
g. Community Science Forum	11
Schedule for academic year 2003-2004	13
Class roster for academic year 2003-2004	14
Orientation	15
a. Mentors	
i. What advantages accrue from mentoring a Base Pair student?	15
ii. Are your activities amenable for mentoring a Base Pair student?	16
iii. What are the qualifications of a Base Pair student?	17
iv. What expectations should you have of a Base Pair student?	17
v. What are your responsibilities as a Base Pair mentor?	18
vi. Advice for new mentors	19
vii. Mentor checklist	20
b. Students and parents	21
i. Parent information	22
ii. What is Base Pair ?	22
iii. Who is qualified?	24
iv. What are typical projects?	25
v. What are the benefits for participation in Base Pair ?	25
vi. What are the responsibilities of students in Base Pair ?	26
Base Pair student list, 1992-2004	27
Evaluation questionnaires	
a. Mentor's questionnaire	30
b. Parent's perceptions	32
c. Student's perceptions	33

WHAT IS *BASE PAIR*?

Base Pair, initiated in 1992, is a successful biomedical research mentorship program that pairs faculty from the University of Mississippi Medical Center (UMC) with public high school students and educators. Oriented to interact primarily with participants from the largest public school district in the state of Mississippi, the Jackson Public School District (JPSD), the program has expanded to enlist students and/or teachers from school districts throughout central Mississippi, including Byram, Clinton, Madison, Mendenhall, and Northwest Rankin. This biomedical research mentorship program allows each student to experience the scientific field in a "hands-on" manner under the guidance and supervision of a faculty researcher at UMC.

In preparation for this mentoring, **Base Pair** created a novel, graduation credit-accruing high school course, *Biomedical Research*, that prepares students for laboratory research at UMC during the academic year. Sanction of this course by the Mississippi Department of Education permits any public high school in Mississippi to adopt the course. Currently, though, this course is only offered at Murrah High School in the JPSD. Mentors subsequently host students in active research, in their laboratories, during afternoons for a full semester. Teacher professional development during the summer and science curriculum enhancement activities throughout the year complement student participation to create a highly coordinated impetus for communication of contemporary biomedical science ethical concerns, techniques, and philosophies.

Base Pair has had the good fortune to have been (1994-2003) and to continue to be (2003-2007) funded by three consecutive awards from the prestigious **Howard Hughes Medical Institute** (<http://www.hhmi.org>), the largest private supporter of science education initiatives in the world. Through their Precollege Science Education Initiative for Biomedical Research Institutions, the Institute has awarded nearly \$1.3 million to support the **Base Pair** program.

Base Pair seeks to cultivate career awareness of high school students in areas related to health care/biomedical research, to train such students to function as effective "Communicators of Science" to lay persons, and to advance science curriculum development within the target school district. Additional funding support has been provided by the National Science Foundation and local groups, including Health Futures and the Community Foundation of Greater Jackson.

Success in communicating science is highlighted by the fact that close to four dozen scientific abstracts or publications have been co-authored or presented by high school students in professional scientific forums, while over a dozen teachers have accomplished similar professional goals. In addition, a web site, <http://basepair.library.umc.edu>, serves as a focal point to enhance communication with the general public and helps users locate web-based and library resources relating to biomedical research and mentorship. The program actively uses innovative communication devices, such as videophones, to impart greater flexibility for interactions among mentors, students and teachers. As of May, 2003, 108 students have participated or are participating in **Base Pair**. Of these, 53% have been African-American, and 62% have been women. Of those eligible (16 remain in high school), 100% have continued to an undergraduate experience, 55 of whom have chosen a science major. Thirty-two have completed undergraduate training, and of those, 26 have either enrolled in graduate training or have entered a science-related career. Eleven have entered a Ph.D., M.D. or an M.D./Ph.D. training program. A total of 34 teachers have participated actively in **Base Pair** training. Moreover, through curriculum development activities and participation in Web-based mentoring groups, the positive educational impact of the program has reached literally hundreds more students and educators.

WHAT HAS *BASE PAIR* ACCOMPLISHED?

1. Scientific citations

The fundamental purpose of *Base Pair* is to engage high school students and teachers in meaningful, productive biomedical research. Fulfillment of this objective proffers additional advantages, including enhancement of secondary school academic expectations and orientation of students towards diverse biomedical careers. As evidence of this, a substantial number of *Base Pair* students and teachers have established *bona fide* professional scientific credentials as co-authors and presenters of their research in one or more scientific forums. These credentials can be considered an important component of each participant's lifetime resume. A listing of these products is provided below.

Base Pair Student Citations, 1994-2003

Abstracts and Presentations

1. Siegel, S.*, Collier, B.J., Hardy, C.L. Growth factor-dependent adhesion of a murine multipotential progenitor cell to fibronectin (FN). J. Miss. Acad. Sci. 39: 36, 1994.
2. Piletz, J. E., Ivanov, T. R., Blackwell, H.**. Zhu, H. and Feng, Y.: Immunoreactive distribution of imidazoline receptors in rat brain. J. Miss. Acad. Sci. 41: 79, 1996.
3. Song, Y., Su, D., Evans, K**, Mamoon, N. and Wellman, S. Production of histone H1 variants in, and purification from *E. coli* cells. J. Miss. Acad. Sci. 41: 43, 1996.
4. Graham, C. O., Graham, T. L. **, Cossio, J. A. and Norcum, M. T.: Labeling of tRNA with three types of biotinylation reagents. J. Miss. Acad. Sci. 41: 42, 1996
5. Summers, S**, Petrini, M. F., Patel, R. and Norman, J. R.: Comparison of respiratory parameters during weaning from mechanical ventilation. J. Miss. Acad. Sci. 41: 57, 1996.
6. Wilson, M. T**, Taylor, A**, Das, S. K., Angel, M. F., Rajeswara, A. M., Kanji, V. K. and Cohly, H.: Effect of tumeric and its components on calcium, sodium/potassium adenosine triphosphatases. J. Miss. Acad. Sci. 41: 64, 1996.
7. Taylor, A**, Wilson, M. T**, Das, S. K., Mani-Sundaram, D., Angel, M. F., Kanji, V. K., Rao, K. M. R. and Cohly, H.: The effect of tumeric in NOS in acute and chronic wounds. J. Miss. Acad. Sci. 41: 64, 1996.
8. Manisundaram, D., Rajeswara, M., Wilson, M.T**, Taylor, A**, Talbot, P., Das, S. K. and Cohly, H. H. P.: Evaluation of nitric oxide synthase activity in patients with wounds. Southern Medical Journal, October 1995.
9. Anders, R., Summers, R. L. Woodward, L. H., Jenkins, A. K** and Galli, R. L.: Effect of routine pulse oximetry measurements on emergency department triage classification. Presented at the American College of Emergency Physicians Scientific Assembly, 1996.
10. Cohly, H. H. P., Smith, A., Paige, C**, Smith, R. A., Angel, M. F., Rogers, B.: Role of processed hair on hydrogen peroxide-induced human dermal fibroblast cell injury. Presented at the 7th Annual Meeting of the European Tissue Repair Society, 1997.
11. Priester, M**, Hiser, L., Norcum, M.T.: Green fluorescent protein as a folding substrate for eukaryotic cytosolic chaperonin. J. Miss. Acad. Sci. 42: 52, 1997.

12. Burke, S**, Tsao, A. K., Anderson, L., Tucci, M., Benghuzzi, H. A.: The effectiveness of targeted delivery of androgenic hormone on fracture healing. *J. Miss. Acad. Sci.* 42: 52, 1997.
12. Cohly, H. P. C., Hammett, C., Das, S., Angel, M. F., Kanji, V., Taylor, A.*, Benghuzzi, H., Markov, A. K.: Effect of turmerin on endothelial denudation by air drying. *J. Miss. Acad. Sci.* 43: 43, 1998.
13. Burke, S**, Tucci, M., Tsao, A. K. Hughes, J., Benghuzzi, H. A.: Physiological response associated with targeted delivery of androgenic hormone using traumatized rat femurs as a model. *J. Miss. Acad. Sci.* 43: 45, 1998.
14. Washington, N. T.**, Ray, L.: Neonatal outcome of infants born to mothers with systemic lupus erythematosus at UMC. *J. Miss. Acad. Sci.* 43: 48, 1998.
15. Cohly, H. P. H., Smith, A., Paige, C**, Allen, R. A., Blanchard, C., Rogers, B., Angel, M. F.: Role of processed on hydrogen peroxide-induced human dermal fibroblast (F) cell injury. *J. Miss. Acad. Sci.* 43: 50, 1998.
16. Nick, T. G., Lawrence, L.**, Bracey, J.**: Quantifying the predictive information on health-risk behaviors. *J. Miss. Acad. Sci.* 43: 63, 1998.
17. Yan, M., Greer, B**, Sinning, A.R.: Suppression of mesenchymal cell formation in the cardiac cushion tissue by retinoic acid is mediated by abnormal secretion of particulate matrix. *FASEB J.* 12: A46, 1998.
18. McNair, L., Moore, E**, Watt, J., Swiatlo, E., Cameron, J.A., McDaniel, L.S.: Activity of trovafloxacin against clinical isolates of pneumococci, staphylococci, and enterococci. Presented at the Joint meeting of Southeastern & South Central Branches of the American Society for Microbiology, 1998.
19. E. Moore**, L.B. Washington, McDaniel, L.S.: Analysis of pneumococcal clinical isolates by DNA hybridization using a fragment specific for *pspA*. *J. Miss. Acad. Sci.* 44: 53, 1999.
20. Cornelius, K**, Tucci, S., Benghuzzi, H.: The role of glucocorticoids on the proliferation rate of raw cells maintained at different cell densities. *J. Miss. Acad. Sci.* 44: 55, 1999.
21. Jones, A.E., Boes, B., Haymans, G**, West, R. Summers, R.L., Rockhold, R.W. Body weight gain and food intake following recurrent methcathinone intoxication. *Ann. Emerg. Med.*, In Press, 1999.
22. Bullock, J**, Benghuzzi, H., Tucci, M. Histopathological evaluation of kidney tissues exposed to sustained delivery of steroids in ovariectomized adult female rats. *J. Miss. Acad. Sci.* 45: 58, 2000.
23. Cornelius, K**, Thompson, L., Benghuzzi, H., Tucci, M., Hughes, J.L. The role of glucocorticoids on human pulmonary adenocarcinoma (A549 cells) in culture. *J. Miss. Acad. Sci.* 45: 55, 2000.
24. Vig, P.J.S., D'Ercole, J., Ye, P., Subramony, S.H., Qin, Z., Robertson., P**, Insulin-like growth factor-I (IGF-I)/spinocerebellar ataxia-1 (SCA-1) double transgenic mice: Role of IGF-I in pathogenesis of SCA-1. Abstract # 651804, American Academy of Neurology 2000 meeting.
25. Salahudeen, A., Huang, H., Ndebele, K., Jenkins, J. and A. Salahudeen. Heme oxygenase-1 (HO-1) reduces cell death during cold storage: Studies utilizing hemin induction and HO-1 gene transfer. *Acta Haematologica* 103 (Suppl. 1): 85, 2000.
26. Adams, R.G**, Dellinger, T., Kuhn, M., Streckfus, C. and Bigler, L. p53 as a diagnostic tool for the detection of cancer and its role in tumor progression. *The Pharmacologist*, 43: 102, 2001.
27. Alam, A**, Benghuzzi, H., Tucci, M. The effect of cinnamon extracts on human buccal epithelial cells in culture. *J. Miss. Acad. Sci.* 46: 49, 2001
28. Adams, R.G**, Bigler, L., and Streckfus, C. p53 protein detection as a diagnostic tool for cancer. *FASEB J.*, 15: A559, 2001.
29. Gui, L., Ringelberg, C.S., Sidhu, R., Larkin, B**, Kaelbling, M. Point mutations in PTEN in additional carcinoma and uninvolved tissue panels of various types. Presented at the UMC School of Health Related Professions annual research day, April, 2001.

30. Rhodes, S.C., Butler, T.** , McDaniel, O. IFN-Gamma gene polymorphism relevant to cytokine hyperexpression in African-Americans with hypertension. *Human Immunol.* 62 (Suppl. 1): S92, 2001.
31. Rockhold, R.W., Lampton, A.** , Lee, J., Yokum, D., Zhu, H. Does neonatal methyl parathion (MP) alter brain acetylcholinesterase and withdrawal from morphine dependence in adult rats? *J. Miss. Acad. Sci.* 47: 44, 2002.
32. Cornelius, K.** A discussion of glutaminy cyclase in the rat brain. *J. Miss. Acad. Sci.* 47: 24, 2002.
33. Butler, T.** , Rhodes, S., Colman, V., Oropeza, M., McDaniel, D.O. Cytokine promoter gene polymorphism in association with cytokine expression in patients with hypertension. *J. Miss. Acad. Sci.* 47: 46, 2002.
34. Cohly, H.H.P., Rao., M.R., , Kanji, V., Patlolla, B., Taylor, A.** , Wilson, M.T.** , Angel, M.F., Das, S.K. Effect of turmeric, turmerin and curcumin on Ca²⁺, Na⁺/K⁺ ATPases in conconavlin A-stimulated human blood mononuclear cells. Presented at RCMI Spring Symposium, 2002, Jackson, MS.
35. Cohly, H.H.P., Hammet, C., Das, S.K., Angel, M.F., Kanji, V., Taylor, A.** , Benghuzzi, H., Markov, A.K. Effect of turmerin on endothelial denudation by air drying . Presented at RCMI Spring Symposium, 2002, Jackson, MS.
36. Vig, P.J.S., Qin, Z., Subramony, SH., McKinsey, D.J.** Inositol 1,4,5-trisphosphate receptor binding in cerebellum in spinocerebellar ataxia-a (SCA-1) transgenic mice. To be presented 2003 Experimental Biology meetings.
37. Quilter, B.** , Averett, N.T., Hutchins, J.B. Methyl parathion intoxication alters the neurochemistry of the septohippocampal pathway. *J. Miss. Acad. Sci.* 48: 20, 2003.
38. Powell, L., Howell, T., Holloway, J., Jenkins, C.** , Lineberry, B., Yokum, D., Rockhold, R. In vivo antimuscarinic actions of the antihistaminergic agent, desloratadine. *J. Miss. Acad. Sci.* 48: 53, 2003.

Manuscripts

1. Cohly, H. H. P., Taylor, A.** , Angel, M. F., Salahudeen, A. K. Effect of turmeric, turmerin and curcumin on H₂O₂-induced renal epithelial (LLC-PK₁) cell injury. *Free Radical Biology & Medicine*, 24: 49-54, 1998.
2. Summers, R. L., Anders, R. M., Woodward, L. H., Jenkins, A. K.** , Galli, R. L. Effect of routine pulse oximetry measurements on emergency department triage classification. *American Journal of Emergency Medicine*, 16: 5-6, 1998.
3. Cohly, H. H. P., Rao, M. R., Kanji, V. K., Manisundram, D., Taylor, A.** , Wilson, M. T.** , Angel, M. K. and Das, S. K. The Effect of Turmeric in NOS in Acute and Chronic Wounds. Accepted for publication, *Wounds*, 1999.
4. Swiatlo, E., Moore, E.** , Watt, J. and McDaniel, L.S. In vitro activity of four fluoroquinolones against clinical isolates of *Pseudomonas aeruginosa* determined by the E test. *International Journal of Antimicrobial Agents* 15: 73-76, 2000.
5. Adams, R.G.** , Dellinger, T., Kuhn, M., Streckfus, C. and Bigler, L. p53 as a diagnostic tool for the detection of cancer and its role in tumor progression. *J. Mississippi Academy of Sciences* 46: 163-169, 2001.

Base Pair Teacher Citations, 1994-2003

1. Rockhold, R.W., King, T.* , Dick, L., Planck, J. **Base Pair**: A research mentorship program between Jackson Public Schools and the University of Mississippi Medical Center. *J. Miss. Acad. Sci.* 39: 75, 1994.
2. King, T.* , Rockhold, R. W. **Base Pair**: Evolution of a mentorship-driven curriculum. *J. Miss. Acad. Sci.* 40: 83, 1995.

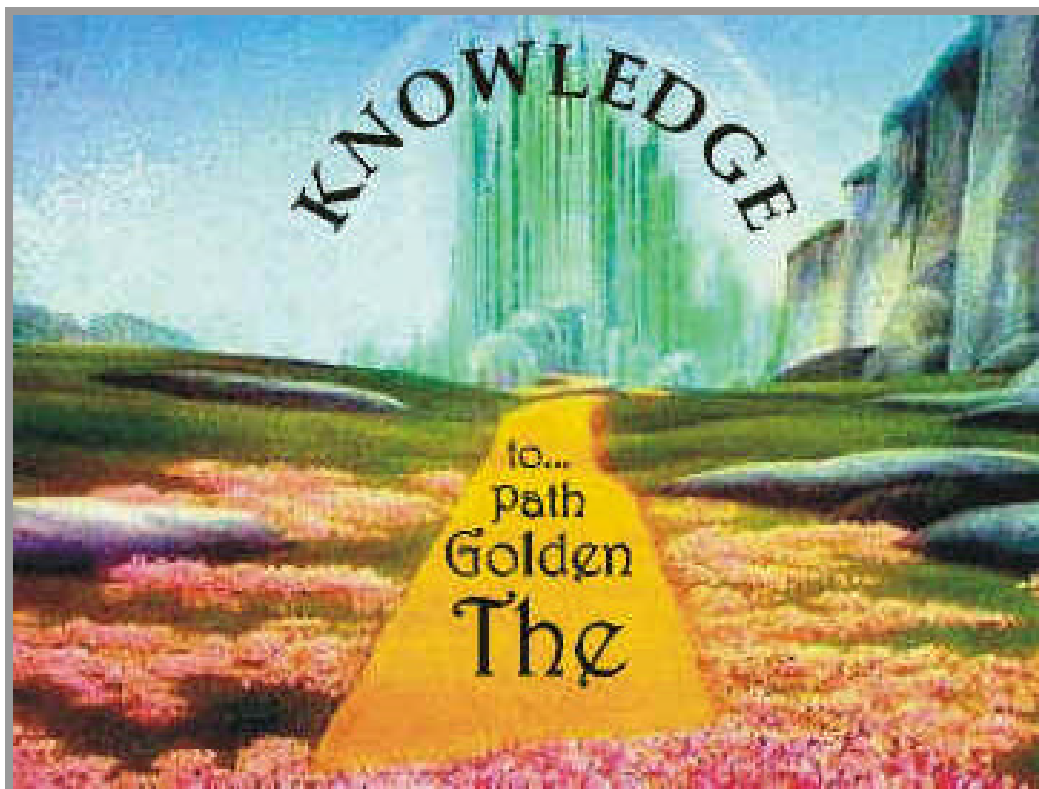
3. King, T.* and Rockhold, R. W: **Base Pair**. A mentorship-driven curriculum with physiological enhancements. J. Miss. Acad. Sci. 41: 87, 1996.
4. King, T.*, Planck, J., Rockhold, R. W. Evolution of a mentorship-driven curriculum beyond biomedical research. J. Miss. Acad. Sci. 42: 82, 1997.
5. King, T.*, Planck, J., Rockhold, R. W. Evolution of a mentorship-driven curriculum beyond biomedical research. Presented at the Mississippi Science Teachers Association Annual Meeting, 1997.
6. Rockhold, R. W., Johnson, W. Technology Plan – Jackson Public School District. J. Miss. Acad. Sci. 42: 82, 1997.
7. Farrish-Aseeri, H.* and Rockhold, R. W. **Base Pair**. Development of environmental science course content. J. Miss. Acad. Sci. 43, 82, 1998.
8. Lipscomb, J.*, Wellman, S., and Rockhold, R. W. **Base Pair**: Development of a lesson plan for implementing a high school molecular biology course. J. Miss. Acad. Sci. 43: 83, 1998.
9. Cook, C.* and Rockhold, R.W. Introducing biotechnology themes into a high school biomedical mentorship program. J. Miss. Acad. Sci. 45: 91, 2000.
10. Rockhold, R.W. and Cook, C.* **Base Pair**: A biomedical research mentorship collaboration among a medical center, a high school district, a state academy of science and a private foundation. Presented at the 2000 American Association of Academies of Science annual meeting and science innovation exposition. February 21, 2000.
11. Redhead, K.* and Rockhold, R.W. A high school humanities course incorporating biotechnology issues. J. Miss. Acad. Sci. 45: 93, 2000.
12. Rockhold, R.W. and Cook, C.* **Base Pair**: A biomedical research mentorship initiative at the high school level. The Pharmacologist 43: 102, 2001.
13. Cook, C.* and Rockhold, R.W. **Base Pair**: Biomedical research mentorship for high school students – A teacher’s perspective. J. Miss. Acad. Sci. 46: 80, 2001.
14. Rockhold, R.W., Bender, S.*, Scarff, T., Chambliss, D., Allen, F., Fahmy, N., Srinivasan, A., **Base Pair** “SOARS”s with help from the National Science Foundation (NSF). J. Miss. Acad. Sci. 47: 86, 2002.
15. Rockhold, R.W. **Base Pair**: A high school biomedical mentorship program. Presented at: Best Practices for Communicating Science and Technology to the Public, Gaithersburg, MD, 2002 http://www.nist.gov/public_affairs/bestpractices.
16. Rockhold, R., Cook, C.*, Bender, B.* **Base Pair**: A decade of mentorship collaboration enabling high school students in biomedical research. EB 2003 meeting, April, 2003.
17. Bender, S.* Genetic mystery: Electrophoresis Simulation. Mississippi Science Teachers Association Meeting, October, 2002.
18. Cook, C.* Sick School. Mississippi Science Teachers Association Meeting, October, 2002.

* **Base Pair** Teachers

** **Base Pair** Students

2. Web site

An interactive web site, hosted through the University of Mississippi Medical Center’s Rowland Medical Library (<http://basepair.library.umc.edu>), serves as the portal to deliver information about **Base Pair** to anyone with Internet access. In addition, this site is configured to provide detailed and comprehensive information and links concerning mentoring in a biomedical research institution.



As one example, “The Golden Path to Knowledge” is the entry page to a comprehensive series of links to information regarding information research, global databases, and sites dealing with both biomedical research issues and mentoring.

3. ***Telemachian Notes***

Beginning in June, 2001, a quarterly newsletter, entitled *Telemachian Notes*, was initiated. This newsletter is mailed to every participant and alumnus of **Base Pair**, as an additional means of maintaining communication with current and former participants. Increasingly, the preparation and production of this are being delegated to each **Base Pair** class.

4. **Course**

The science course, *Biomedical Research*, is designed to prepare high school students to participate in graduate level research activities in a university or medical center, under the direct supervision of a faculty mentor. It also provides instruction in the processes of information research, electronic communications, oral and written presentation, and use of contemporary computer-based presentation software. It is fully accredited with the Mississippi Department of Education for one Carnegie credit towards high school graduation and can be offered by any high school in this state.

5. **Teacher grants**

One aspect of summer teacher training offered by **Base Pair** is instruction in grant writing. The objective is to provide high school teachers with additional opportunities to support enhanced educational and laboratory-based activities in their classrooms, over and above that which can be provided through existing school funding. At this writing, fully 89% of all teacher-initiated grant proposals written following this training have been funded by external funding agencies and over \$40,000 new dollars have been acquired to support advanced science education activities.

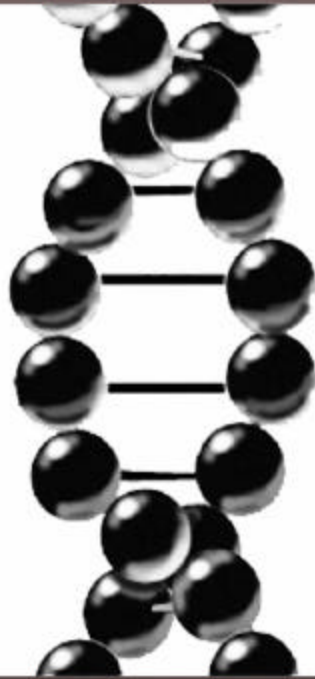
6. Student Oriented Academic Research (SOAR)

In 2002-2003, a new educational program, called Student Oriented Academic Research (SOAR) was implemented in Jim Hill High School by Ms. Susan Bender under the direction of the then Jim Hill Principal, Dr. Earl Watkins. The SOAR program engages mainstream students with an interest in science in a two-year course of academic study and development of a research project that will be completed at that school site. An offshoot of the **Base Pair** program and developed under the auspices of a supplemental K-12 Higher Education Partnership (KHEP) grant from the National Science Foundation, SOAR is intended to serve as a vehicle for expansion of **Base Pair**-initiated concepts of inquiry-based and laboratory-oriented science learning. With an initial enrollment of 60-odd students, SOAR is poised to enroll over 70 students for the 2003-2004 academic year. Plans to use Jim Hill as a training center to expand the SOAR program progressively to at least three other JPS school sites between 2003 and 2007 are being developed.

7. Community Science Forum

The Community Science Forum (CSF), initiated in 2002-2003, is a novel venue that addresses two major objectives of the **Base Pair** program, i.e. to prepare students to function as effective "Communicators of Science" to the general public, and to more directly involve the general community in science education. The CSF is a series of evening seminar-style presentations, held on the UMC campus and prepared and presented by high school students in the **Base Pair** and SOAR classes. The subjects for the CSF have been and will continue to be issues and controversial topics where contemporary biomedical/biotechnological science activities have a direct impact upon the society in which the students live and in which the general public has a critical stake in decision-making. Parents, other students and members for the community at large are invited. In October, 2002, the **Base Pair** class presented the inaugural session on the topic of "*West Nile Virus*", a particularly timely subject as the Jackson Metro area was experiencing the first season of human impact from this newly emerging, insect-borne, disease. This was followed in March of 2003 by a series of four presentations by the Jim Hill SOAR class on aspects of "*Bioterrorism Agents*". Again, this was an issue of direct relevance to the community in light of emerging terrorist threats and the need for public awareness in the wake of terrorist attacks on September 11, 2001. A series of three presentations are planned for 2003-2004 on the subjects of "*Health Risks for Type II Diabetes Mellitus*" (October, 2003); "*Bioengineered Foods*" (February, 2004); and "*Technology Training for Jackson Public School Parents*" (tentative, May, 2004).

BASE



PAIR

SCHEDULE FOR ACADEMIC YEAR 2003-2004



August 7, 2003	First day for JPSD teachers
August 13, 2003	Students report
August 18 - 29, 2003	Information research orientation at UMC and parent orientation to Base Pair (date to be announced)
September 1, 2003	Labor Day holiday (JPSD, UMC)
September 18, 2003	Parent/Teacher Conference Day (JPSD)
October 13, 2003	Fall break (JPSD)
November 26- 28, 2003	Thanksgiving Holiday (JPSD, UMC)
December 15 - 19, 2003	Selection of mentors by JSPD students
December 19, 2003 to January 6, 2004	Winter Holiday Break (JPSD)
January 8, 2004	UMC reception for students, mentors and parents
January 12- 16, 2004	UMC orientation for JPSD students
January 19, 2004	Martin Luther King Holiday (JPSD, UMC)
February 13, 2004	Professional development day (JPSD)
February 16, 2004	Parent/Teacher Conference Day (JPSD)
February 18 - 20, 2004	Trip to Mississippi Academy of Sciences meeting in Biloxi, MS
March 15-19, 2004	Spring Break
April 9 & 12, 2004	April Holidays
May 28, 2004	Last day for students (JPSD)

CLASS ROSTER FOR ACADEMIC YEAR 2003-2004

First Year Students

1. David Arrington
2. Gwen Ballard
3. Jordan Butler
4. Anderson Lampton
5. Chaffron McCarty
6. Austin Richardson

Mentors

- Lyle Zardiakas, Ph.D.
- Donna Sullivan, Ph.D.
- Rob Rockhold, Ph.D.
- Larry McDaniel, Ph.D.
- Charles Streckfus, D.D.S.
- Drew Hildebrandt, Ph.D.

Second Year Students

1. Janelle Alleyne
2. Brittney Archie
3. Jessica Bourne
4. Antoinette Dawson
5. Jonathon Priester
6. Candace Robertson
7. Tribetta Spires
8. Janelle Taylor
9. Raven Worthy

MENTORS

This portion of the handbook is provided to assist mentors and potential mentors. Mentors are essential to the success of **Base Pair** and must expect to devote a significant amount of time and direction to a mentored student. Mentors are compensated for their efforts by access to funds for purchase of laboratory/academic supplies, as well as by the personal satisfaction of assisting in the intellectual development of a young person interested in scientific research.

Any UMC faculty member who has an active research program, whether clinical or basic in nature, may participate as a mentor. Mentoring purely to provide students with an opportunity to “shadow” clinical activities, unrelated to a research project, is discouraged.

WHAT ADVANTAGES ACCRUE FROM MENTORING A **BASE PAIR** STUDENT?

A mentoring relationship is the basis for scientific education, particularly in the academic arena. Thus, mentoring is a professional imperative, as emphasized by the comments of Eugene Garfield, “*Mentoring is the major way in which scientists can nourish the taproot upon which future scientific achievement depends for its growth and full flowering.*” (*The Scientist*, Dec. 7, 1992). However, mentoring of a **Base Pair** student imposes unique constraints on the mentoring relationship in a laboratory environment. These constraints include most critically a relative lack of advanced technical knowledge on the part of the student, the necessity for interaction with a student who is unfamiliar with the routine, rigor and ritual customary to a professional working environment, and a relative lack of time for direct laboratory work by the student. Nevertheless, over a period of almost a decade and with a sample of 80 students, the consensus among mentors at the University of Mississippi Medical Center is that the mentoring program has been decidedly positive for the individual mentor, the mentor’s laboratory, and the Medical Center. Personal satisfaction in assisting the intellectual growth of students is an important criterion cited by mentors who repeatedly host students in their research endeavors. Community recognition, both the lay community and the Medical Center community, has been significant for **Base Pair** mentors. Professional productivity, while modest by some standards, has been achieved in many instances for those mentors who have co-authored scientific manuscripts, abstracts and presentations with a student (see citation list for a full record). Finally, with the support of the Medical Center administration and external funding agencies (most notably the Howard Hughes Medical Institute), hosting a **Base Pair** student has provided mentors with additional funds for maintaining their research operations. Currently, a mentor can request up to \$1,500/student in supply funds. Limited additional funding is available under special circumstances for purchase of small items of equipment, travel reimbursement, and publication costs. These monies are not specifically demarcated for support of a student project, but rather are intended to reimburse mentors for their time and effort in hosting a student.

ARE YOUR ACTIVITIES AMENABLE FOR MENTORING A *BASE PAIR* STUDENT?

Students participate in *Base Pair* as part of their regular high school curriculum and are subject to the attendance requirements of the Jackson Public School District and the Mississippi Department of Education. Their curriculum devotes two class periods to *Base Pair* activities, each weekday, for the entire school year. They are expected to be available for activities at UMC between the hours of 1:45 and 3:30 p.m for the period of January 12, 2004 to May 28, 2004. However, it is reasonable to expect that it may require between 10 and 15 minutes for students to shuttle between Murrah High School and UMC. They effectively have 90 minutes each weekday for activities at UMC. Recognizing the constraints that this limited period of time places on the pursuit of research, in most cases, a student will need to be assigned to assist in some aspect of an ongoing project in which you and your research staff are engaged. It is frequently difficult to design a separate and unique experimental problem for each student. Some of the most successful mentor-student pairings have been those in which the student learns to function as a member of a research team and learns the “research ropes” through cooperative pursuit of your laboratory’s research goals.

A mentor should consider the following criteria when evaluating whether their laboratory would serve as a good host for a *Base Pair* student:

- **Can a realistic laboratory experience be provided in 90 minutes, 5 days/week?**
- **Is such an activity appropriate for a high school science background?**
- **Can the mentor and/or laboratory staff devote regular time to the student?**

WHAT ARE THE QUALIFICATIONS OF A *BASE PAIR* STUDENT?

Most ***Base Pair*** students are selected from the Jackson Public School District Academic and Performing Arts Complex (APAC) program. The APAC program includes some of the highest achieving students in the district and generally provides a higher than average science background. Students most commonly participate during their junior year, although many seniors also are selected. On rare occasions, freshmen or sophomore students have participated and performed well. Each student will have participated in a one semester preparatory course at Murrah High School. That course introduces students to the UMC Rowland Medical Library information database and basic search strategies, provides advanced training in the most basic laboratory and presentation skills, and provides each student with a general knowledge of the research interest of potential mentors. The program has included at least two students from Murrah High School who were selected to be Presidential Scholars. One ***Base Pair*** student has progressed to the Westinghouse Science Competition as a semi-finalist. Based on research performed at UMC, many students have garnered regional and national attention in science fair competitions and have been awarded numerous scholarships for their work. However, many of these students have continued to work on their projects beyond the one semester nominally arranged for ***Base Pair*** activities. As mentioned earlier in this document, over three dozen presentations, published abstracts or full-length scientific publications have been produced with a ***Base Pair*** student as presenter or co-author. A complete list of these citations has been provided earlier in this document.

WHAT EXPECTATIONS SHOULD YOU HAVE OF A *BASE PAIR* STUDENT?

The basic assumptions concerning a ***Base Pair*** student are that they will be:

- **enthusiastic,**
- **curious and intellectually dynamic,**
- **well-behaved,**
- **punctual,**
- **expected to keep the mentor informed of absences,**
- **prepared to accept a reasonable degree of independence in daily activities, and**
- **willing and prepared to engage in directed, yet independent, study.**

WHAT ARE YOUR RESPONSIBILITIES AS A *BASE PAIR MENTOR?*

Your primary responsibility is to engage a student in a meaningful research experience, including taking active responsibility for technical and safety training. It is important that you clearly define the expectations that you have for your student. The student will need to be tutored to enhance their understanding of the laboratory activities and the way in which their project fits into those activities. Each mentor must take responsibility for allocating time to provide adequate guidance and supervision of their student. It is not unreasonable to engage technical staff, graduate students and post-doctoral fellows in the supervisory process, but, as a mentor, you are expected to devote personal time to meeting with the student. Each student is required to finish the academic year with a formal oral presentation of their experiences in the laboratory. That presentation will take place in a formal setting at which mentors, students, and parents are expected to attend.

In summary, the basic mentor responsibilities include:

- **clearly and formally defining expectations for each student,**
- **providing technical and safety training, with continued oversight in these areas,**
- **providing career guidance,**
- **meeting program deadlines,**
- **assisting student in preparation and delivery of a final report,**
and
- **listening and providing advice.**

The following material is taken from the American Chemical Society Project SEED Handbook and may be useful as a guide to those considering participation as a **Base Pair** mentor:

ADVICE FOR NEW MENTORS

For most people, good mentoring, like good teaching, is a skill that is developed over time. Here are a few tips for beginners:

Listen patiently. Give the student time to get to issues that are sensitive or embarrassing.

Build a relationship. Simple joint activities—walks across campus, informal conversations over coffee, attending a lecture together—will help to develop rapport. Take cues from the student about how close the relationship should be.

Don't abuse your authority. Don't ask students to do personal work, such as mowing lawns, baby-sitting, and photocopying.

Nurture self-sufficiency. Your goal is not to “clone” yourself but to encourage confidence and independent thinking.

Establish “protected time” together. Try to minimize interruptions by telephone calls or visitors.

Share yourself. Invite students to see what you do, both on and off the job. Talk about your own successes and failures. Let the student see your human side, and encourage the student to reciprocate.

Provide introductions. Help the student to develop a professional network and build a community of mentors.

Be constructive. Critical feedback is essential to spur improvement, but do it kindly and temper criticism with praise when deserved.

Don't be overbearing. Avoid dictating choices or controlling a student's behavior.

Find your own mentors. New advisers, like new students, benefit from guidance by those with more experience.

Base Pair Mentor Checklist

<u>ITEM/TASK</u>	<u>DATE NEEDED</u>
1. Submit summary (abstract) of research activities/ student opportunities to Program Director	Early September
2. Anticipate/respond to student requests for interviews	Mid-October-November
3. Expect confirmation of student appointment	Early December
4. Attend parent-student (evening) reception	January 8, 2004
5. Student joins laboratory	Week of January 12-16
6. Establish clear policies for student involvement For example: <ul style="list-style-type: none">• Who will function as daily lab “tutor”?• How will student and mentor communicate?• What schedule for regular meetings?	Second week in January
7. Submit orders for mentor reimbursement	Anytime, January to June
8. Determine schedule for final student presentation	Late March/early April
9. Attend final student presentation	Early May (date tentative)

STUDENTS AND PARENTS

This section of the handbook is intended to provide information to students and their parents concerning participation in the student component of the **Base Pair** program. An additional source of information is the **Base Pair** web site (<http://basepair.library.umc.edu>).

The Program Director is Rob Rockhold, Ph.D. Any questions, comments or concerns related to participation in **Base Pair** should be directed to this individual. He can be contacted through the following means:

Mailing Address

Rob Rockhold, Ph.D.
Professor,
Department of Pharmacology and Toxicology
Associate Professor (Research),
Department of Emergency Medicine
University of Mississippi Medical Center
2500 N. State St.
Jackson, MS 39216-4505

Telephone (Day)

(601) 984-1634 (24 hour voice mail)

(601) 984-1637 (**FAX**)

Telephone (Evening)

(601) 898-1122

E-mail

rrockhold@pharmacology.umsmed.edu

PARENT INFORMATION

Parental involvement is fundamental to academic success in any venue, but is particularly relevant to **Base Pair** activities. Parents must recognize, and support, the academic and behavioral challenges offered by participation in **Base Pair**. The level of academic performance demanded and facilitated by Ms. Cook, the lead teacher at Murrah High School, is extremely rigorous, and often requires a substantial investment of a student's time in development of independent projects. Many of these will require access to World Wide Web databases and/or information sources available through the Rowland Medical Library at the Medical Center. The understanding and support, by parents, of the time requirement for student participation in **Base Pair** is essential. Transportation and attendance issues related to activities at the Medical Center, allocation of a student's time between **Base Pair** activities and other curricular and extra-curricular studies, including after-school jobs, may require specific attention and assistance from parents. An overnight field trip, by the **Base Pair** class, to the annual meeting of the Mississippi Academy of Sciences (to be held in Biloxi, MS during February of 2004) is planned. This event has been a component of **Base Pair** since its inception and has been well received by students and parents in the past. Students are accompanied by the lead teacher, but any parent who is interested in participating as a chaperone should contact the Program Director.

Parental attendance is requested at three events, an informal evening information and orientation session for **Base Pair** students (both first and second year) and their parents in late August, 2003, a formal evening reception offered early in 2004 on the Medical Center campus, and at the end-of-year oral presentations by students, which will also be held on the Medical Center campus (see the program calendar for specific dates). Invitations for these events will be forthcoming. Formal evaluation, by parents, of the program has always been requested.

WHAT IS BASE PAIR?

Base Pair is an academically-based, graduation credit-accruing program in which high school students have an opportunity to engage in meaningful biomedical research on the University Medical Center campus and learn about careers in biomedical and health care research. It pairs students from the Jackson Public School District (and more rarely, from other high schools in the Jackson Metro area) with active research faculty from the University of Mississippi Medical Center. Academic training takes place primarily at Murrah High School, with some sessions on the Medical Center campus. All research activities occur on the Medical Center campus. A maximum class size of 15 students can be supported with current external funding from the Howard Hughes Medical Institute. Typically, each class consists of 8-12 first year students and 3-7 second year students.

First Year Students: Students must be enrolled in the Mississippi Department of Education-approved preparatory course, *Biomedical Research*, (or an acceptable substitute) prior to engaging in activities on the Medical Center campus. Currently, this course meets for two consecutive 50 minute class periods, five days per week on the Murrah High School campus

during the Fall semester. Ms. Cindy Cook is designated as the lead teacher for the **Base Pair** program and is responsible for all Murrah-based teaching and for supervision of all **Base Pair** student participants. The purpose of *Biomedical Research* is to prepare the student to participate safely and productively in the intensive, independent adult atmosphere of a Medical Center research laboratory. Laboratory, electronic information research, and presentation skills are emphasized in an academically rigorous course offered in the high school setting. Maintenance of a research journal, use of Powerpoint software, and frequent, detailed writing assignments are among the criteria used to evaluate (grade) student performance. Students are expected to use the information research skills to become familiar with the research interests of potential mentors and to relate those interests to other members of the class as part of their regular, graded course activities. Students are also expected to initiate contact with up to three Medical Center researchers with whom they have an interest in working. That contact will facilitate the formal selection process, in which both a student and a mentor agree to work together. Selection is normally completed prior to the year-end holiday vacation.

Beginning in 2003-2004, **Base Pair** students will also become involved in preparing and presenting at least two Community Science Forum events as well as submitting material for inclusion in the quarterly newsletter, *Telemachian Notes*.

Medical Center-based **Base Pair** research activities for students normally begin with the commencement of the high school academic calendar in January. Students are expected to be available for activities at the Medical Center between the hours of 1:45 and 3:30 p.m for the period of January 6, 2003 to May 23, 2003. This is an attendance policy of the Jackson Public School District and the Mississippi Department of Education. Any absence must be communicated both to a student's mentor and the high school attendance coordinator. However, it is reasonable to expect that it may require between 10 and 15 minutes for students to shuttle between Murrah High School and the Medical Center. Transportation is currently provided by bus for students between the high school and the Medical Center. Parking for students is also available for no cost in the Veteran's Memorial Stadium parking lot on North State St. or in pay parking garages on the Medical Center campus. Thus, students effectively have 90 minutes each weekday for activities at the Medical Center.

It is important to recognize that, although two class periods each day is a major commitment on the part of a student and the school district, meaningful biomedical research is exceedingly difficult to perform in this limited period of time. Recognizing the constraints that this limited period of time places on the pursuit of research, a student will, in most cases, be assigned to assist in some aspect of an ongoing project in their mentor's research laboratory. It is frequently difficult to design a separate and unique experimental problem for each student. Some of the most successful mentor-student pairings have been those in which the student learns to function as a member of a research team and learns the "research ropes" through cooperative pursuit of mentor's research goals. Parents should be willing to consider the possibility that some students may need to spend additional time, after normal school hours and/or on weekends, to complete critical experiments with their mentors. The time demands for a program such as **Base Pair** are such that students are often counseled, during the application process, that participation in other after-school programs and jobs is discouraged.

Academic Responsibilities

Base Pair, as a component of the APAC program, seeks out academically superior students and must maintain the highest academic standards. Participation in the academic courses associated with **Base Pair**, which are detailed below, is subject to assignment of specific academic responsibilities and deadlines. Adherence to these, and to the JPSD attendance requirements, must be maintained. The grade that is achieved by each student will be earned by the degree of completion of these requirements. It is possible to obtain a less than satisfactory grade (i.e., lower than a B), which is weighted according to the APAC

expanded scale. Both students and parents must be aware of these responsibilities and deadlines and recognize the additional commitments required by the program. It is particularly important to note that the academic responsibilities are equally important in the second (UMC mentorship) semester of the first year and during the second year, should a student participate in that component.

At the present time, **Base Pair** student participants at Murrah High School enroll in three academic courses. These are *Biomedical Research* (one Carnegie credit, two semesters), *Molecular Biology* (1/2 Carnegie Credit, Fall semester), and *Field Studies* (1/2 Carnegie credit, Spring semester). Each course is graded by the **Base Pair** lead teacher at Murrah High School and is academically rigorous. Students and parents can expect that completion of numerous independent projects, which require information to be obtained through the Rowland Medical Library at the Medical Center and/or through accessing resources available on the World Wide Web, will be required.

Second Year Students: Most commonly, junior and senior high school students are chosen to participate in **Base Pair**. In some cases, a student who begins participation as a junior may wish to engage in a second year of research activities at the Medical Center. To do so, that student must reapply for a second year, with formal agreement from their mentor, and must present evidence of an ongoing research project in which they are participating. Second year students are expected to devote two class periods, each day for a full year (both Fall And Spring Semesters), to working at the Medical Center in that mentor's research laboratory. Supervision by the **Base Pair** lead teacher will continue. Students will be expected to meet on a regular basis with that teacher at Murrah High School and will also be expected to prepare and present/submit assignments as defined by the lead teacher. Student grades will be determined by performance on such assignments as well as on the performance of the student in the mentor's laboratory.

WHO IS QUALIFIED?

Any student at Murrah High School may apply. Students from other JPSD high schools may also apply, but issues of transportation and enrollment in *Biomedical Research* (presently offered only at Murrah) must be worked out to the satisfaction of the appropriate JPSD staff and the Program Director. The same criteria are applicable to students from outside the JPSD who wish to enroll in **Base Pair**. Most commonly, students are selected to participate in **Base Pair** during their junior or senior year. A firm grounding in Biology and Chemistry is essential for students to become fully engaged in the process of biomedical research. High level skills in written and spoken English, and in reading are essential, as is the ability to utilize basic personal computer software (word processing, Powerpoint, spread sheets, etc.) and navigate the Internet with both insight and discrimination. Demonstration of a keen sense of curiosity and a strong record of academic proficiency are critical to selection into **Base Pair**. Each applicant must also undergo a personal interview with the Program Director and/or the lead teacher during the selection process. The final choice for selection remains the prerogative of the Program Director alone.

WHAT ARE TYPICAL PROJECTS?

Virtually all aspects of laboratory-based biomedical research have been encompassed by students working in the program. Gene transfection, protein and nucleotide separations, bacterial and mammalian cell culture, experimental animal surgery and handling, psychological testing, computer modeling, immunology, tissue transplantation and histological procedures are common to many of the projects in which students have engaged in past years. Students have worked under supervision of mentors in the Schools of Medicine, Graduate Studies, Nursing, Dentistry and Health Related Professions. Parents are referred to the list of student co-authored abstracts, presentations and publications provided earlier for more detailed descriptions of **Base Pair** student research.

Work in Medical Center laboratories carries potential risks not found in the normal high school environment. These include physical, chemical and radiation hazards, as well as exposure to experimental animals and blood-borne pathogens. The University of Mississippi Medical Center maintains a strict policy for formal training of employees, students and volunteers in such risks, and operates under state and national guidelines for purchase, handling and disposal of risk-related material. In addition, **Base Pair** mentors accept the responsibility for informal training of students in their laboratories, each of which may have unique hazards associated with it. Further training is provided by introduction of students to on-line training in laboratory and biomedical hazards, such as the *Safe Science* site provided by the Howard Hughes Medical Institute (<http://www.hhmi.org/research/labsafe/>). Parents should feel welcome to discuss any possible concerns with the Program Director.

WHAT ARE THE BENEFITS FOR PARTICIPATION IN *BASE PAIR*?

Base Pair offers students a highly engaging, rigorous, and well supervised introduction to contemporary biomedical research – the science for the new millennium. Students will receive both didactic and hands-on training in contemporary biological, chemical and information research techniques – for which academic credit towards high school graduation will be provided. Exposure to issues of biomedical research and clinical ethics, as well as training in advanced communication and presentation skills will accrue. Students will be trained both to understand the science in which they are engaged and to communicate the societal impact of that science with clarity to persons who have not had the benefit of such training. The concept of training **Base Pair** students to become “Communicators of Science” to the lay public is fundamental to the program. Students generally gain better discipline skills, as well as enhanced composure, confidence and self esteem by functioning as advanced students in an adult working environment. Many students (approximately one-third of all participants) have been sufficiently successful in their research as to serve as a co-author/presenter of their work in a professional scientific forum. Citations of such scientific presentations become part of the formal scientific literature and are credentials that will follow a student throughout his/her career – whether that career is directly related to science or not. Finally, and by no means of the least importance, the unique nature and

national stature of the **Base Pair** program is looked upon extremely favorably by college and university admissions officers.

In summary, the principal benefits for participation in Base Pair are:

- **advanced science training,**
- **career orientation,**
- **training as “Communicators of Science”,**
- **enhanced discipline and esteem,**
- **academic graduation credit, and**
- **the possibility of scientific presentation/publication.**

WHAT ARE THE RESPONSIBILITIES OF STUDENTS IN *BASE PAIR*?

A **Base Pair** student must be prepared to embark on a year-long period of rigorous academic learning, both in the classroom, in the mentor’s laboratory and particularly, as a result of independent, inquiry-based study. They must be willing to accept personal responsibility for their conduct, both during classroom activities at Murrah High School and at the University of Mississippi Medical Center. Attendance issues are of paramount importance. Students remain under State laws pursuant to school attendance, even during the time spent on the Medical Center campus. The **Base Pair** mentors devote a considerable portion of their time in supervision of the student participants. Students must be prepared to communicate on a regular basis with their mentors/mentor’s laboratory staff and keep those individuals apprised of the student’s schedule and any absences, planned or otherwise.

In summary, the basic assumptions concerning a *Base Pair* student are that they will be:

- **enthusiastic,**
- **curious and intellectually dynamic,**
- **well-behaved,**
- **punctual,**
- **expected to keep the mentor informed of absences,**
- **prepared to accept a reasonable degree of independence in daily activities, and**
- **willing and prepared to engage in directed, yet independent, study.**

Alphabetical **Listing of *Base Pair* Students**
1992-2004

Adams, Rander (Giovanni)
Akponwei, Camille
Alam, Ayesha
Alexander, J. Douglas
Alleyne, Janelle
Alleyne, Thelma
Archie, Brittney
Aregood, Jennifer (Joy) (Mrs. Jason Pierce)
Arrington, D.J.
Ballard, Gwendolyne
Bird, Joshua
Blackwell, Holley
Bourne, Jessica
Bracey, Jenelia Krishaun
Brent, Cheryl
Brown, Krystalyn Joi
Bullock, John E.
Burks, Stephanie M.
Butler, Ann Taylor
Bulter, Jonathon
Butler, Jordan
Campbell, Jasmine
Causey, Bill
Coppenbarger, Lee Ann
Cornelius, Kimberly Michelle
Davis, Monica
Dawson, Antoinette
Edwards, Ta-Tijera
Evans, Kathryn (Mrs. Cory Schnider)
Forbes, Jeri Michelle
Fortier, Octavia
Franklin, Cortlandt
Gibson, Angelea
Gilbert, Roderick J.
Graham, Tanitia
Greer, Brian Lee
Hardy, Lathan III
Haymans, George
Henson, Monica
Hudson, Ava
Irving, Morenike F.
Jackson, Octavia
Jenkins, Ayanna
Jenkins, Colibri Necole
Lampton, April Rozell
Lampton, Anderson

Larkin, Brianna Rose
Lawrence, Lakeshia
Lewis, Kyle
Li, Vivian
Lobb, Collin Jethro
Magee, Marcus Carvel
Marsh, Timothy Edward
May, Jeffrey
McCarty, Chaffron
McClure, Allison Brooke
McCool, Jason
McKinsey, Duriel
McMahan, Roger (Andy)
Mickens, Frank
Miller, Lance
Mitchell, Maegan
Moffett, Shemeka
Moore, Edward C.
Nguyen, Trung Ba
Oatis, Andromeda Jineane
Owen, Colin
Pace, John
Paige, Crystal Rochelle
Palmer, Corey Leigh
Palmer, Lena
Pates, Adam
Peters, Princess Michelle
Powell, Vernita
Prewitt, Greta
Priester, Jonathon
Priester, Melvin III
Quilter, Benjamin
Richardson, Austin
Rightmeyer, John (Jake)
Robertson, Candace
Robertson, Paul G.
Salahudeen, Amin
Sampson, Candice Marie
Schimmel, Elizabeth
Schwartz, Antony (Tony)
Seto, Christina
Sherwood, Erik
Siegel, Sandra
Simpkins, Ralene D.
Spires, Tribetta
Stallman, Martha
Stewart, Armond
Summers, Shundria
Taff, Philip C.
Taylor, Annelle

Taylor, Jamille
Tennin,.L. C., III
Tran, Thuy P. (Samantha)
Washington, Nina T.
Whitfield-Smith, Louisa L.
Wicks, Tonitric
Wilson, Cindy
Wilson, Melanie
Worthy, Raven
Young, Jerlen

The University of Mississippi Medical Center *Base Pair* Program

Mentor's Questionnaire

Name of Student _____ Date _____

Mentor _____ Department _____

Please check the appropriate choice.

Part I - STUDENT

- How would you rate the student's understanding of his/her duties and responsibilities?
Excellent () Good () Fair () Poor ()
- How would you rate the student's lab skills at the end of this internship?
Excellent () Good () Fair () Poor ()
- What is your estimation of the social maturity of your student?
Excellent () Good () Fair () Poor ()
- How would you rate student's responsibility to work, attendance, etc.?
Excellent () Good () Fair () Poor ()
- How would you rate the student's laboratory skills prior to the beginning of this internship?
Excellent () Good () Fair () Poor ()
- How would you rate the student's ability to communicate your research activities to the general public?
Excellent () Good () Fair () Poor ()
- Please suggest a letter grade for your student.
A () B () C () U () Unsatisfactory
- To what degree did the intern provide assistance to your project?
Greatly () Moderately () Minimally () Not at all ()
- Do you anticipate including your student as a co-author in any presentation/publication resulting from this semester's research?
Yes () No ()

If "Yes", please forward citation information to Dr. Rockhold as soon as practical.

Part II - Program

1. Did you receive sufficient advance information concerning the program?

Yes () No ()

2. Which area(s) of student preparation need to be improved, if any?

Lab skills _____ Communication skills _____ Other _____

Please suggest specific areas/techniques/skills for additional training:

3. What is your estimation of the abilities of secondary school students to adapt to professional laboratory activities?

Excellent () Good () Fair () Poor ()

4. Would you consider participating in this program again?

Yes () No ()

5. Please indicate any suggestion for improvement.

Thank you.

Please return to: Rob Rockhold, Ph.D., Pharmacology and Toxicology (984-1634)

The University of Mississippi Medical Center **Base Pair** Program

Parent's Perceptions

Parent's/Guardian's Name _____ Student's Name _____

For questions 1-8, please respond to the statements by choosing one of the following four categories:

4 = Strongly Agree, 3 = Agree, 2 = Disagree, 1 = Strongly Disagree

[UMMC = The University of Mississippi Medical Center, JPSSD = Jackson Public School District]

- | | Score |
|--|-------|
| 1. My child's understanding of science is greater. | _____ |
| 2. My child was able to effectively communicate to me the value and context of the research in which he/she was engaged. | _____ |
| 3. My/Our understanding of biomedical science-related issues has improved. | _____ |
| 4. My child's chances of attending his/her preferred college are greater. | _____ |
| 5. My child's interest in a science-related career is greater. | _____ |
| 6. The demand on my child's time was excessive/counterproductive. | _____ |
| 7. Training in safety issues/supervision at UMMC was adequate. | _____ |
| 8. If available, would you value greater direct parent involvement?
(If so, please append any suggestions for such involvement) | _____ |

For questions 9-13, please rate the various aspects of the program and program staff using a 10-point (10-1) scale, with

10 = Exceptional/Highest Quality, 5 = Neutral/No Opinion, 1 = Unacceptable /Poorest Quality.

- | | |
|---|-------|
| 9. Academic rigor (compared to other high school courses) | _____ |
| 10. Accessibility/Visibility/Responsiveness of Program Director | _____ |
| 11. Commitment of UMMC to its surrounding community. | _____ |
| 12. Instructional support/guidance offered by Lead Teacher. | _____ |
| 13. Attention offered by Murrah High School to academic innovation. | _____ |

Please return, with any additional comments, questions, or criticisms to:

**Rob Rockhold, Ph.D., Pharmacology and Toxicology (984-1634)
University of Mississippi Medical Center
2500 N. State St., Jackson, MS 39216-4505**

Student's Perceptions

Student's name _____ Date _____

Mentor's name _____

DIRECTIONS: Rate questions 1-8 below using the following scale:

4 = strongly agree 3 = agree 2 = disagree 1 = strongly disagree

1. ____ Participation in this project has increased my interest in science.
2. ____ Participation in this project has increased my understanding of the research process.
3. ____ Participation in this project has greatly influenced my career choice.
4. ____ My ability to communicate complex issues in science and technology has improved.
5. ____ If I had the opportunity, I would participate in a similar project.
6. ____ I will recommend participation in this project to friends.
7. ____ The time I spent away from regular classes was justified.
8. ____ I am more likely to consider training at /enrollment in University of Mississippi programs.

DIRECTIONS: For questions 9-14, indicate the amount of time spent (at UMMC) in each activity using the following scale:

4 = often (virtually every day) 3 = regularly (every 1-2 weeks) 2 = rarely 1 = never/not applicable

9. ____ Hands-on laboratory activity
10. ____ Library research
11. ____ Computer entry or programming
12. ____ Data analysis
13. ____ Group discussion
14. ____ Safety/hazard training/control (including use of protective clothing/ proper hazard disposal)
15. On-site training/supervision by mentor and/or staff at UMMC was
____ Adequate ____ Inadequate
16. Preliminary training provided at Murrah High School was
____ Adequate ____ Inadequate

17. Which of the following activities would improve your preparation for activities at UMMC?
(check all that apply)

Increase direct contact between students and potential mentors (eg., formal interviews)

Increase group discussions in class

More skill development at Murrah (eg. technical writing, computer skill; specify below)

Laboratory skills training

Use of statistics programs

Use of spreadsheets

Technical writing/laboratory notebook format

Reading/analysis of technical writing/papers

18. Indicate the capabilities, laboratory techniques and equipment with which you have become familiar as a result of this program. (check all that apply)

Cell culture

Chemical analysis

Spectrography

Recombinant DNA/RNA, protein manipulation

Electrophoresis/chromatography

Computer programming

Stress management

Data analysis

Behavioral testing

Exercise testing

Animal handling/care/surgery

Statistical analysis

Electronic information retrieval

Presentation skills

Other _____

19. Indicate your current career choice. (check one)

Engineering/Physics

Public Service

Computer Science

Business

Environmental Science

Law

Chemistry

Teaching

Biology

Fine Arts/Humanities

Medicine (M.D./D.O. degree)

Social Sciences

Nursing

Military

Dentistry

Other _____

Indicate any competitions you have entered, or plan to enter using the following scale:

1 = entered this year 2 = plan to enter in the near future

20. Local or school science fair

21. Westinghouse Science Talent Search

22. Science and/or Math Olympiad

23. Other _____

Please feel free to make additional comments about your experiences in *Base Pair*.

Please return to:

**Rob Rockhold, Ph.D., Pharmacology and Toxicology (984-1634)
University of Mississippi Medical Center
2500 N. State St., Jackson, MS 39216-4505**