



Baylor  
College of  
Medicine

Baylor College  
of Medicine's  
Center for  
Educational  
Outreach

Our community,  
Our health,  
Our future.

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# INTRODUCTION

Baylor College of Medicine is a premier health sciences university with a vision of improving health through science, scholarship and innovation. From our home campus in Houston, Texas, our graduates — physicians, researchers and other healthcare professionals — staff our affiliated hospitals throughout the Texas Medical Center, and work in other healthcare settings locally and globally. Through our unique agreement with NASA, Baylor biomedical research even extends into outer space!

With the generous help of our supporters, alumni and friends, Baylor is **powering the future of medicine** through our commitment to education, research and care.

But there is another equally important way we are shaping healthcare's future — and you can see it right here in our own community.

We prepared this special eBook to tell you more about how ... again with the help of generous donors and organizations ... Baylor is promoting science teaching and learning, opening the doors of opportunity for young people from all backgrounds to develop interest and preparation for pathways in science and medicine.

Please read on to learn more about Baylor College of Medicine's **Center for Educational Outreach**.

# THE PROBLEM

America is facing a shortage of doctors and other healthcare professionals to meet the needs of a growing, and longer-lived, population. Biotechnology workforce is another very important need, particularly for the Houston area.

In 2019, the Association of American Medical Colleges estimated that by 2032 the U.S. will see a shortage of up to nearly 122,000 physicians.\* Significantly, these findings were released prior to the COVID-19 pandemic — a time during and after which many doctors and other healthcare providers chose to leave the profession, citing exhaustion and burnout.

Another key problem is lack of access by many young people (particularly those in low socioeconomic neighborhoods or rural areas) to educational opportunities that prepare them for careers in health or biomedical science.



\* Source: "New Findings Confirm Predictions on Physician Shortage," [www.aamc.org/news-insights/press-releases/new-findings-confirm-predictions-physician-shortage](http://www.aamc.org/news-insights/press-releases/new-findings-confirm-predictions-physician-shortage)

# THE SOLUTION

Baylor College of Medicine's **Center for Educational Outreach** provides in-person and online education and resources for students, teachers and the public. Its goals are to advance scientific literacy, improve science teaching and learning, and broaden access to education about health and biomedical science. The Center focuses on STEMM education, which includes science, technology, engineering, mathematics and medicine.

Additionally, the Center provides pathways for interested and promising primary, secondary and undergraduate students to explore educational and career opportunities in medicine and the health sciences. We offer programs to help learners develop interest and skills needed to pursue careers in medicine, health professions or science.



# HISTORY OF THE CENTER FOR EDUCATIONAL OUTREACH

In 1900, a group of doctors founded a medical school in Dallas. A few years later, the school affiliated with Baylor University in Waco and was named Baylor University College of Medicine. In 1943, Baylor relocated to join the newly formed Texas Medical Center and moved into the first building in 1947. In 1969, by mutual agreement, the college separated from Baylor University to become an independent institution, and the name was changed to Baylor College of Medicine. Since then, Baylor College of Medicine has been a fully independent nonprofit health sciences university.

Community service has always been one of Baylor's core values. The Center for Educational Outreach is a reflection of this deep commitment. Its roots lie in the agreement established in 1972 between Baylor and the Houston Independent School District (HISD) to create the High School for Health Professions (now known as Michael E. DeBakey High School for Health Professions, *see page 15*).

The Division of School-Based and Minority Student Programs, as it was called, quickly expanded to provide additional programs in HISD and around South Texas, and to build on our long-standing commitment to science teacher professional development.

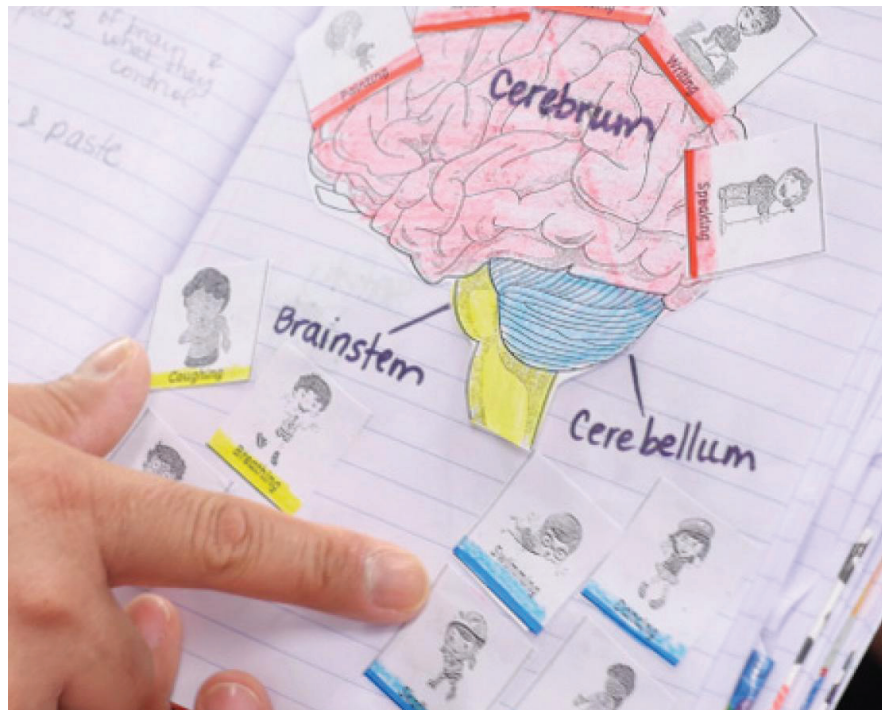
In 1996, the Center for Educational Outreach was established to expand and coordinate these programs. The Center was specifically directed to improve biomedical, basic science and health education across the K-16 continuum, and to increase opportunities for underrepresented populations to access careers in medicine, science and the health professions.

Baylor was nationally recognized for its leadership in developing pipeline programs long before other medical schools. The Center's goal was to increase participation in medical education for students from broadly diverse backgrounds. The Center now is part of Baylor's exciting new Department of Education, Innovation and Technology.

Today, Baylor is recognized nationally as an innovative leader for science and health education among pre-college students. Approaches developed here quickly become best practices across the country.

# CURRICULUM MATERIALS

A key mission of the Center for Educational Outreach is to produce curriculum resources to help teachers introduce students to key concepts in science, technology, engineering, mathematics and medicine (health and biomedical science). Many of these resources are strongly interdisciplinary, embracing fields from biology and life sciences to environmental and physical sciences, genetics and even space medicine. All units are aligned with national and state education standards.



Over the next few pages, we'll show you examples of Center for Educational Outreach materials currently in use in schools in Houston and around the country. In each case, the teacher's guide is designed to provide the educator with a complete, stand-alone curriculum resource.

Many more examples of these lesson plans can be found at our website, **BioEdOnline.org**

## **Learn more!**

If you are a teacher, administrator or other education professional and would like to know more about using Center for Educational Outreach materials in your school, please contact **Nancy P. Moreno, Ph.D.** at 713-798-8200, 800-798-8244, or by email at **edoutreach@bcm.edu**.

# GRADES 3-5: THE SCIENCE OF AIR

In this curriculum, students explore basic concepts related to air, the atmosphere and the process of breathing and respiration. Related topics like allergens, pollutants and types of gases are also addressed. Components also include a storybook, language arts and math explorations and other supplemental materials, all available in English and Spanish. Though designed for grades 3-5, lessons are easily adaptable for other grade levels.

## TOPICS AND ACTIVITIES:

**What Is Air?** Pre-assessment

**Gases Matter:** What is a gas?

**About Air:** Which gases are in air?

**Moving Air:** Why does air move?

**Breathing Machine:** How does air move into and out of the lungs?

**Lungometer:** How much air can be blown out of the lungs?

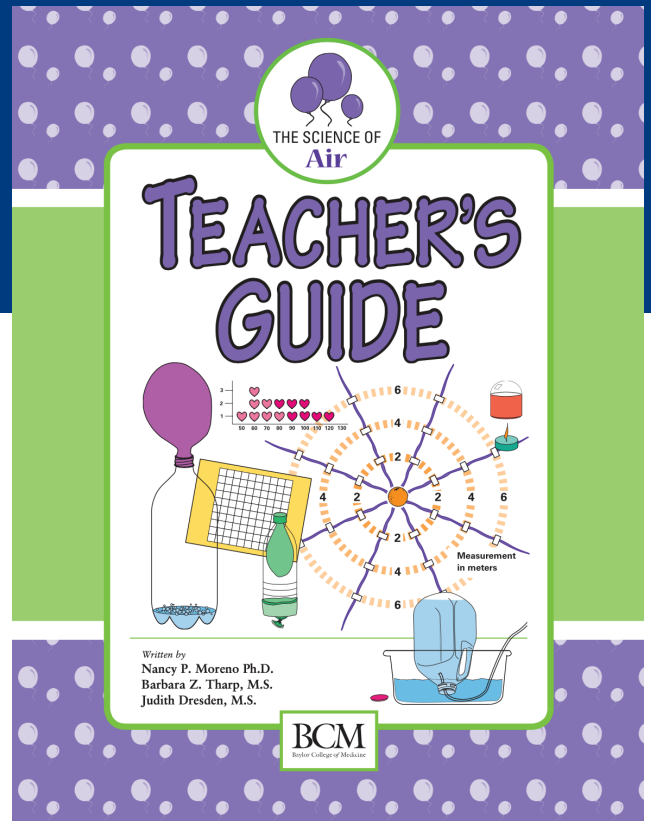
**Heart and Lungs:** Do activity levels affect breathing and heart rates?

**Dust Catchers:** What is in dust?

**Fungus Among Us:** What does mold look like?

**There's Something in the Air:** Do pollutants become concentrated indoors?

**Healthy Homes:** Post-assessment







# GRADES 6-8 AND 9-12: SCIENTIFIC DECISION-MAKING

In this curriculum, students are encouraged to imagine themselves in the role of a doctor or other healthcare provider. What kind of systematic thinking and decision-making skills are required when addressing problems related to health and wellness? Clearly, these lessons have application even for students who never go on to become physicians!

Supplemental resources include information on the parts of the brain used in decision-making, further details on the human cardiovascular system, tools for recognizing the signs and symptoms of a heart attack and other guides.

## TOPICS AND ACTIVITIES:

**Decisions and Risk:** Does having accurate information change how we make decisions?

**Smarter Choices:** What does brain science tell us about decision-making? Can we learn to make better decisions?

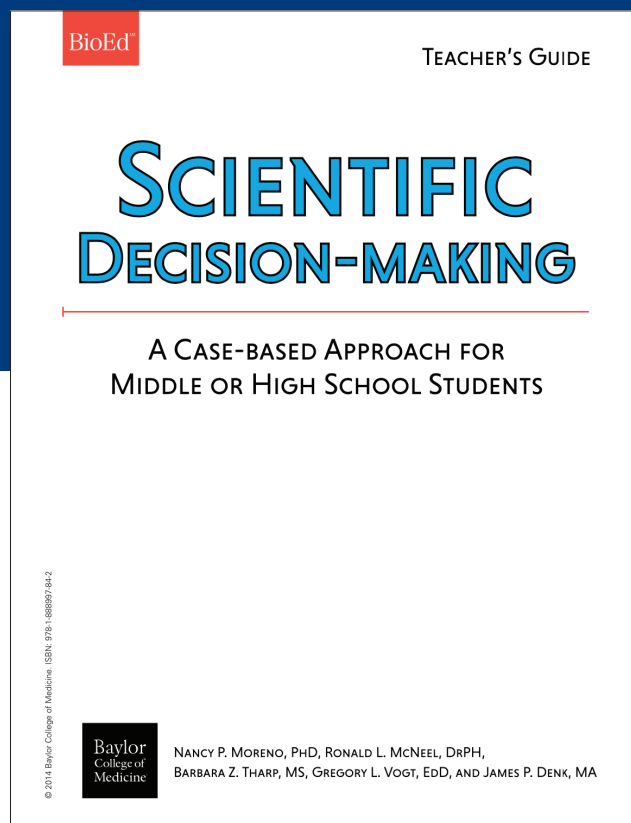
**Introduction to Personal Stories:** How does personal history affect health and risk of disease?

**Heart:** Basic Measurements - What do vital signs tell us about our health?

**Calculating Coronary Artery Disease Risk:** How can we quantify the risk of developing heart disease?

**Team Diagnosis of Three Cases:** How do medical teams apply evidence to reach a diagnosis?

**Comparative Effectiveness Decision-making Tools:** How can consumers make better health decisions?



# STEMM AFTER SCHOOL: THINK LIKE AN ASTRONAUT

In addition to our extensive curricula prepared for regular classroom instruction, the Center for Educational Outreach also has designed several units specifically for after-school programs focusing on STEMM education. And what could be more exciting than learning some of the skills involved in being an astronaut?

Designed for grades 6-8 but easily adaptable for students of other ages, this curriculum introduces students to the structure of the solar system, the complexities involved in space travel and the many challenges humans must overcome to survive in space.

## TOPICS AND ACTIVITIES:

**Where Are We?** The World Spins On and On

**Exploring the Atmosphere:** Air's All Around!

**Exploring Gravity:** Falling Down/Standing Up

**Beyond Earth's Atmosphere:** Celestial Objects

**The Space Adventure:** All About Space Travel

**Astronaut Issues:** Living in Space

**7 Careers in Space Exploration:** It Could Be You!

### Learn more!

Baylor's Center for Space Medicine is a world leader in space biomedical research. To discover more about the Center, including the innovative and exciting work they do every day and the career paths open to undergraduates and medical students in space medicine, visit [bcm.edu/academic-centers/space-medicine](http://bcm.edu/academic-centers/space-medicine).

BioEd™

## Think Like an Astronaut



By  
Gregory Vogt, Barbara Tharp and Christopher Burnett



BioEd Teacher Resources  
[www.bioedonline.org](http://www.bioedonline.org)  
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# TEACHER PROFESSIONAL DEVELOPMENT

The offerings of the Center for Educational Outreach aren't limited to students. We take our relationship with educators in HISD, throughout Texas and around the country very seriously. In fact, Baylor has more than three decades of experience conducting science education programs to promote the career development of teachers and other education professionals.

From brushing up skills, to learning the latest breakthroughs in a variety of scientific and medical fields, to preparing for educational-standards tests, the Center welcomes the opportunity to work with educators in STEM, social studies, the liberal arts and other fields.

## **In-Person Courses**

The Baylor Summer Science and STEM Master Teacher Institutes have reached hundreds of teachers in a variety of formats. We also can tailor workshops and learning series to meet the needs of districts and individual schools.

## **Online Development**

The Center also offers online courses for professional educators and other interested learners. These include SMART Science Content Guides that can help educators prepare for teacher certification tests.

### **Learn more!**

If you are a teacher, administrator or other education professional and wish to know more about the professional development resources available through the Center, please contact **Nancy P. Moreno, Ph.D.** at 713-798-8200, 800-798-8244, or by email at **edoutreach@bcm.edu**. Or visit **BioEdOnline.org**, and be sure to sign up for the mailing list.

# MAGNET SCHOOL PROGRAMS

In addition to curriculum developed for schools across Houston and around the country, the Center for Educational Outreach and HISD have worked together to operate a number of highly successful magnet schools where interested students may explore even more deeply the options open to them in medicine and the biomedical sciences.

## **Baylor College of Medicine Academy at James D. Ryan Middle School**

Operating since 2013 at James. D. Ryan Middle School in Houston's Third Ward, the Baylor College of Medicine Academy at Ryan (BCMAR) offers a STEM magnet program with an emphasis on biomedical sciences to more than 500 middle schoolers from across the entire city. The current enrollment is more than 70% underrepresented minority and 77% economically disadvantaged. Admission to BCMAR is open to any student in the district, with priority given to children who live close to the school.

The key feature of BCMAR's curriculum is the addition of full-year supplementary science classes on topics related to biomedical science. Sixth grade students are introduced to neuroscience. Seventh grade students explore scientific decision-making. Eighth grade students also have the opportunity to earn high school credit. BCMAR is also distinguished by its early introduction of advanced classes in all core subject areas and the foreign language requirement of learning Latin or Spanish. From sixth grade onward, students follow advanced coursework in science, mathematics, English and social studies.



# MAGNET SCHOOL PROGRAMS CONT.

## **Baylor College of Medicine Biotech Academy at Rusk**

Baylor and HISD opened a second open-enrollment STEM magnet school in Houston's historic East End in 2016. While similar to the BCMAR program described above, the Baylor College of Medicine Biotech Academy at Rusk (BCMBAR) emphasizes biotechnology, and also requires advanced learning in Spanish. Students have frequent opportunities to interact with leading physicians and researchers from Baylor and other institutions in the Texas Medical Center. Both middle school campuses are rated "A" by the Texas Education Agency.

## **Other Magnet School Affiliates**

Building on its success with BCMAR, BCMBAR, and particularly the DeBakey High School for Health Professions (*see next page*), the Center for Educational Outreach has worked with schools and districts in South Texas and the Rio Grande Valley to offer similar programs to increase access to high-quality educational opportunities leading to career pathways in science and medicine. These schools include:

- Foy H. Moody High School - Health Science Academy in Corpus Christi
- J.B. Alexander High School Magnet for Health Science in Laredo
- Rising Scholars Academy of South Texas in San Benito
- Science Academy of South Texas in Mercedes
- South Texas Academy for Medical Professions in San Benito
- South Texas Business, Education and Technology Academy in Edinburg
- South Texas High School for Health Professions in Mercedes
- South Texas Preparatory Academy in Edinburg

# MICHAEL E. DEBAKEY HIGH SCHOOL FOR HEALTH PROFESSIONS

If the Center for Educational Outreach has a flagship program, it would have to be the Michael E. DeBakey High School for Health Professions, widely recognized as one of the top college preparatory high schools in the country.

Since its founding in 1972 as an agreement between Baylor and HISD, the school has offered a rigorous, specialized health and science-based curriculum to young people with diverse backgrounds from throughout the area. To date, 6,163 students have graduated from the school, and more than 99% of these students have accessed postsecondary education.

A survey of 2,048 graduates from 1975 to 1992 indicated that more than 57% of the graduates had achieved career objectives consistent with the purposes of the school (e.g., careers in the health professions, medicine or science). Typically, more than 75% of graduates each year report that they will pursue a career in medicine, health professions or science.

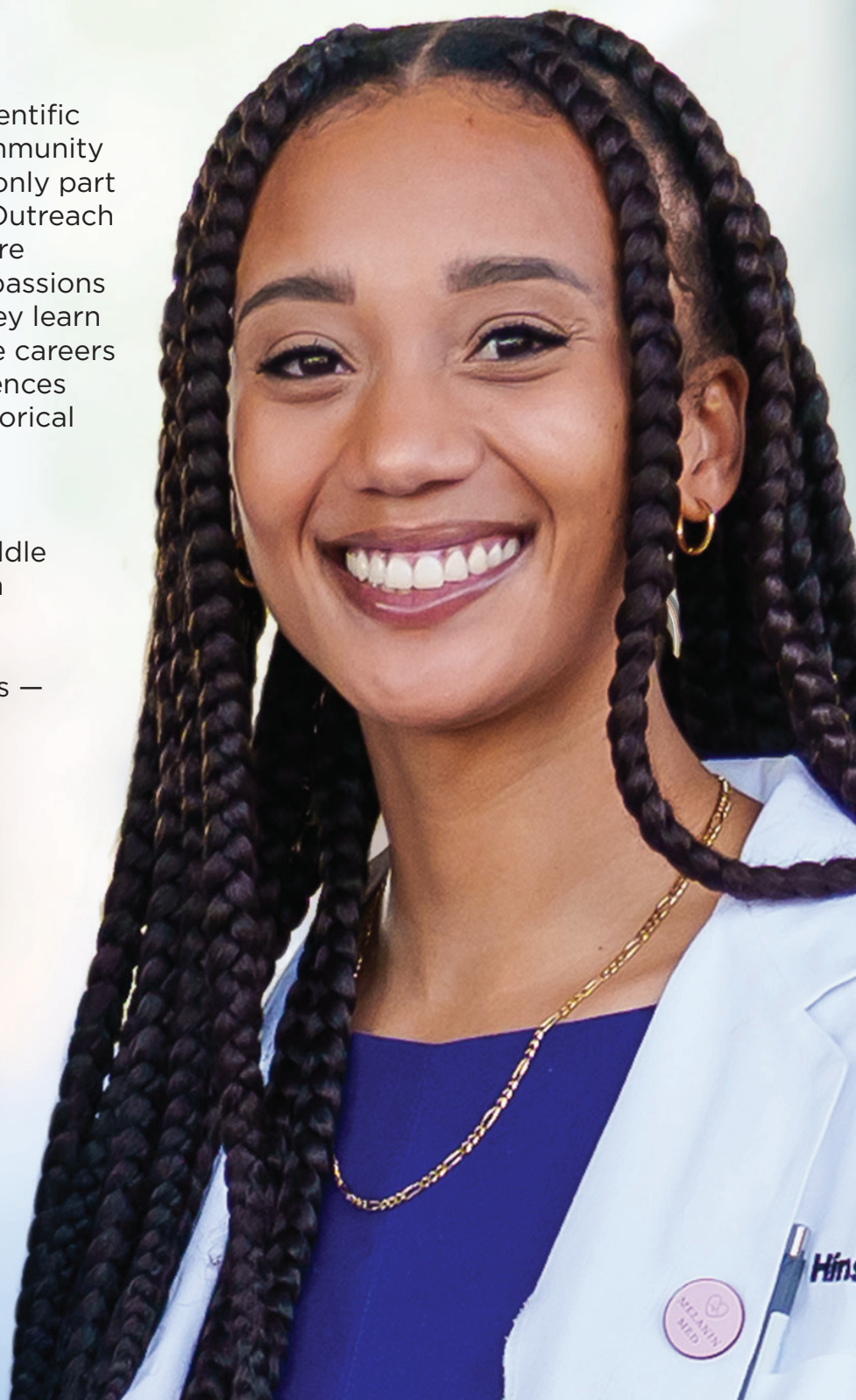
In 1996, the school was renamed to honor Michael E. DeBakey, M.D., the internationally acclaimed surgeon, researcher and administrator who served as president and then chancellor of Baylor College of Medicine from 1969 to 1996. A pioneer in heart surgery, Dr. DeBakey performed the first successful coronary artery bypass operation and was the first to successfully use a partial artificial heart, called a left ventricular bypass pump.



# OPENING DOORS TO HEALTHCARE CAREERS

Sharing health and wellness information and expanding scientific and medical literacy in the community is important work, but it's still only part of the Center for Educational Outreach mission. We also strive to ensure students whose interests and passions have been sparked by what they learn have the opportunity to pursue careers in medicine and the health sciences regardless of traditional or historical barriers.

The Center offers educational programs beginning at the middle and high school levels, through undergraduate degrees, and — depending upon academic requirements and qualifications — entry into medical school.





# SUMMER ENRICHMENT PROGRAMS

## **Doc Prep Program**

Every summer, 60 outstanding rising seniors from select South Texas high schools participate in Doc Prep, a weeklong academic enrichment program at Baylor College of Medicine. In addition to the chance to interact with Baylor physicians, researchers and other healthcare professionals, participants spend time with current Baylor medical students who act as program counselors. They also attend a communications course taught by experts from Rice University, and engage in simulated laboratory research.

## **Premedical Summer Institute**

Undergraduates accepted into Baylor's Joint Admission Medical Program (JAMP) and Baccalaureate/M.D. programs (*see next page*) have the opportunity through the Premedical Summer Institute (PSI) to receive additional educational and practical experiences to enhance their competitiveness in the medical school admissions process. This program introduces learners to Baylor's Schools of Medicine and Health Professions, and serves to enhance their success as undergraduates.

Originally funded by The Robert Wood Johnson Foundation, the PSI addresses the nation's continuing need for a diverse physician workforce and strives to increase the number of physicians from groups that have been historically underrepresented in medicine. The PSI, coordinated by the Office of Admissions in the School of Medicine, provides rigorous coursework in science and communications, as well as the opportunity to gain a greater understanding of medicine through clinical and other learning experiences in the Texas Medical Center.



South Texas High School students performing a heart dissection in class at the Houston Museum of Natural Sciences.

# BACCALAUREATE AND M.D. PROGRAMS

Although the Center for Educational Outreach was born from a relationship with the Houston Independent School District (HISD), you've seen that its influence now reaches well outside the borders of any single district. Since its founding, it has also expanded beyond middle and high schools to work with undergraduate institutions and even other medical schools to expand opportunities for students interested in careers in medicine and the health sciences.

## **Houston Premedical Academy**

Every year, up to six graduates of the DeBakey High School for Health Professions are accepted into the Houston Premedical Academy (HPA). This high school-to-medical school scholarship program guarantees acceptance to Baylor College of Medicine upon meeting all graduation criteria for the University of Houston Honors Program in the Health Professions, The Honors College and other relevant requirements. From acceptance at UH to graduation from Baylor, the HPA provides eight years of full scholarship support, additional funding as eligible, mentorship and other opportunities.

## **Joint Admission Medical Program**

As we've described, Baylor is committed to promoting broad diversity in medical education, and our work with the Joint Admission Medical Program reflects that.

Established by the Texas Legislature, JAMP supports and encourages highly qualified, economically disadvantaged Texas residents pursuing a medical education. As an agreement between 13 Texas medical schools and 68 public and private four-year undergraduate institutions, JAMP offers guaranteed admission to an in-state medical school, scholarships and other pre- and post-admission opportunities for students who meet JAMP's high qualifications.



# POWERING THE FUTURE OF MEDICINE

From leading-edge research, to patient-centered and personalized care, to education and training for future leaders of the health sciences, Baylor College of Medicine is where the future of medicine is taking shape.

But as you've seen, Baylor is also a leader in making our communities healthier, promoting scientific and medical literacy and identifying, supporting and opening doors for students of every age and from every background to pursue their interest in medicine and biosciences to their fullest ability.

Through it all, Baylor is powered by the generosity of donors — including alumni, patients and families, community members and countless supporters and friends — whose commitment to building a healthier world is just as strong as our own.

If you are already one of those donors, thank you so much.

And if not, we invite you to visit [give.bcm.edu](https://give.bcm.edu) today to learn more about the power of your support. Whether you're in Houston or in another part of America or the world, if you share our vision of improving health through science, scholarship and innovation, let's work together to make that vision a reality for more people than ever!

Thank you for downloading and reading this eBook.



Sincerely,

Stephanie Young  
Senior Vice President  
Advancement and Alumni Affairs

# FOR MORE INFORMATION ...

For the latest health news, research advances and other important information:

**[bcm.edu/news](http://bcm.edu/news)**  
**[blogs.bcm.edu](http://blogs.bcm.edu)**

To give a gift, or see the impact of your giving at work:

**[give.bcm.edu](http://give.bcm.edu)**

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## Learn More About the Center for Educational Outreach

If you are a student or parent, teacher, administrator or other education professional who would like to know more about the Center’s curriculum materials, student programs or anything else you’ve read about in this eBook, visit us at **[bcm.edu/education/education-programs/center-for-educational-outreach](http://bcm.edu/education/education-programs/center-for-educational-outreach)** or email **[edoutreach@bcm.edu](mailto:edoutreach@bcm.edu)**.

We’d love to hear from you!

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