GSBS NEWS

Summer 2000

Graduate School of Biomedical Sciences The University of Texas-Houston Health Science Center/M.D. Anderson Cancer Center

Teaching 'How to Discover' for 37 Years

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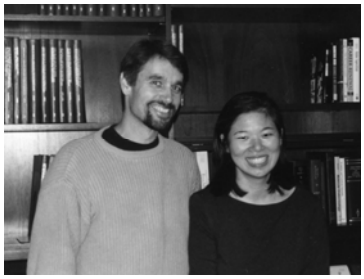
. . . SET

GO!

GSBS CLASS OF 2000

Table of Contents

Page 2	Award Winners
Page 3	Dean's Notes
Page 4	Message from the GSBS Faculty President to the Graduates **Steven J. Norris, Ph.D.**
Page 5	Commencement Address **"Third Millennium Science: Research in a Brave New World"** Distinguished Alumnus **Michael E. McClure, Ph.D.** (1970)
Page 9	GSBS Class of 2000 **Master of Science Degrees**
Page 11	GSBS Class of 2000 **Doctor of Philosophy Degrees**
Page 14	Faculty Membership Committee Report
Back Cover	GSBS Alumni Association: All Aboard!



☆ AWARD WINNERS ☆

New **Fulbright Scholar**, 4th year Ph.D. student Sally Kim, (*right*) will travel to Germany for research work at the prestigious Max Planck Institute known for its work in neuroscience. Ms. Kim is doing research studies on the spatial and temporal dynamics of calmodulin in neurons. M. Neal, Waxham, Ph.D., *(left)* is Kim's advisor.

The **Rosalie B. Hite Fellowship** 2000/2001 recipients in the GSBS are: Mary Coolbaugh-Murphy in Molecular Genetics, Michael Siciliano, Ph.D., Advisor; Joshua Krumenacker in Pharmacology-Physiology, Ferid Murad, Ph.D., Advisor; and Shi, Zheng (Jane) in Experimental Therapeutics; William Plunkett, Ph.D., Advisor. This prestigious honor provides a $20,000 award for the year to each recipient.

The **Aaron Blanchard Award** winner for 2000 was Steven McCullough. McCullough, now a Ph.D. was a 5th year student working in cancer therapy, Richard Wendt III, Ph.D., Advisor. The Blanchard Award is named for a GSBS student who succumbed to brain cancer in 1998.

Cover: Belisa Diaz assists Anjanette Watson.
Soon to be graduates lined up backstage.
Martha Rodriquez Sandoval receives congratulations from UT M.D. Anderson Cancer Center President John Mendelsohn and Health Science Center President M. David Low.

All Commencement photos courtesy of Ms. Joann Sowell

Dean’s Notes

. . .On "using your left hand"

The day of commencement is always special, but this year it was doubly special for me, and I would like to share that story with you. The GSBS Commencement ceremonies on that day were wonderful: the students were great, the parents and faculty were beaming with pride, and the speaker, Dr. Michael McClure from NIH, gave a fine address (see pages 5-8 for an excerpt). However, the story I want to share took place in suburban Chicago that evening.

Several months before, I received a phone call from Dwight, a guy I played basketball and football with in the early 60's. He said that he had recently seen one of our favorite high school coaches around the old neighborhood and that "Coach" was in the early stages of Alzheimer's disease. This prompted Dwight to organize a dinner for the old gang from high school as a salute to our several surviving coaches before memories of their coaching days were completely lost. I said I would be there and proceeded to make travel plans to fly to Chicago immediately after the GSBS Commencement. If I looked a little anxious on stage during the ceremony, it was because I had a very tight travel connection to make at George Bush Intercontinental Airport.

Fortunately, all went well, and I arrived at the appointed restaurant in my hometown of Cicero, Illinois, just in time for the festivities. I had anticipated that there might be 20-30 guys from my class in attendance, but I was stunned to find a room with 200-300 middle aged ex-high school athletes from the entire decade of the 1960's - many of whom came from such far away places as California, Texas, Washington state, New England, Florida, Hawaii, and Canada. I immediately thought to myself, what inspired all of these people, most of whom had not even been starting players, to travel so far for a couple of retired coaches who had never won a conference championship (probably more of a comment on the team members than the coaches!)?

As I walked into the gathering, the first person I met was my freshman basketball coach. He had been a Marine drill sergeant prior to becoming a teacher, and he greeted me with a booming voice, "Stancel, how's your left hand doing?" Let me explain. I am right-handed, and during basketball season my entire freshmen year, coach kept stressing that I should practice using my left hand since it is more difficult for opposing players to guard you if you can dribble and shoot with both hands. I tried and tried, but despite my best efforts, I missed numerous left-handed lay-ups in games that year. Even though several of those misses cost us games, the coach was patient and encouraging, and he kept insisting that I use my left hand because it would be better for my basketball career when I got to the varsity. In that instant, 40 years later, I realized for the first time that coach was more interested in my future career than his personal won-lost record; a split second later, I realized why several hundred guys, most of whom had not even been starters, came from thousands of miles away to a dinner for some old coaches with fading memories who never won a championship. I answered his question, "Just fine coach, and thank you."

That experience prompted me to use this opportunity to salute all our great faculty "coaches" who keep encouraging our GSBS students to "use your left hand", even if it costs you something in the short term. That's what coaching, and teaching, is all about. Thanks to all of you for making sure our students have the best chance for great careers in science and research - that's the won-lost record that counts the most for us as GSBS faculty members!

MESSAGE TO THE CLASS OF 2000

Steven J. Norris, Ph.D., Faculty President

Dear graduating students, family members, friends, colleagues, and distinguished guests:

It is indeed an honor to bring you the congratulations and best wishes of the GSBS Faculty. In case it has been unclear to the family members and friends how your favorite graduate student has been spending their days, nights, and weekends over the past several years, I thought I would start by briefly summarizing what a graduate degree in Biomedical Sciences means. A Ph.D. degree means that the student has learned to assimilate and distill the scientific information in a particular area, formulate a hypothesis addressing an aspect of that topic, design an experimental approach, interpret the resulting data, and present and publish their findings for the scientific community and general public. A Masters degree is much the same, except you have less time to do it! This process, which defines what it means to be an independent investigator, will be repeated throughout your lifetime. Although the knowledge you acquire along the way is important, the process itself is vital. In this case, the CPU is more essential than the hard drive.

Every faculty member has a heart to heart talk with their graduate student when they complete their degree, and this is a very satisfying time when the advisor can loosen the reins and provide the last few pearls of wisdom. I distinctly remember my final meeting with my mentor, Jim Miller at UCLA, and in particular his parting words of advice: that I should always wear matching socks. (I've tried to hold to that, with mixed success). I've never had the privilege of giving a final heart to heart talk to 36 graduating students, so I plan to take full advantage of it.

My advice is neither unique nor profound, resembling instead three well-worn coins in a familiar fountain. First, find joy in small increments of success. Progress in science can be frustrating, often moving at a snail's (Aplysia's?) pace. At times we feel like we're making the sand that will go in the brick that makes up a building, but sometimes the smallest discoveries are the most important. Second, ask important questions. It is easy in science to follow familiar trails, going through the valleys rather than conquering the mountains. Take a few minutes each day to ask yourself: Is what I'm doing really addressing the central question of my field? Like the legendary ninja, don't be afraid to rip the heart out of your scientific area (not your competitor) rather than just pat it on the shoulder. Third, share your excitement and enthusiasm with those around you. You all know the moment: you reach into the film developer and pull out **THE AUTORAD**. The one that proves the concept you've been working on for the past two years. Do you keep that to yourself? NO!! I have colleagues I can always go to (or call on the phone) and, jumping up and down, tell "LOOK WHAT WE'VE FOUND!" They'll say, "That's great, that's fantastic!" then after five minutes of jumping up and down ask "What does it mean?" Think back to your favorite teachers or fellow students, and I believe you'll find that they convey that excitement and sense of discovery.

There are times when all scientists get down, when our role seems to change from "discoverer of future knowledge" to "expeditor." When I get down like that, I think back to the time in high school when I reached down, picked a blade of grass and thought, "There is more wonder in this blade of grass then can be understood in a lifetime." Students, keep that wonder the rest of your lives. Faculty, if you have let that sense of wonder slip away, recapture it and continue to pass it on to those around you. In fact, everyone in this room, regardless of your background, can appreciate the wonder of life. Next time you wake up, you can look around and think, "Wow, this is really neat." Thank you, and best wishes to all of you for your continued success on the heels of this major achievement.

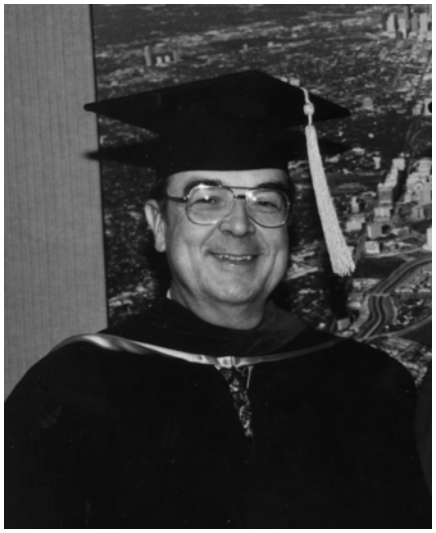
Like the legendary ninja, don't be afraid to rip the heart out of your scientific area (not your competitor) rather than just pat it on the shoulder.

2000 Commencement Address

Third Millennium Science: Research in a Brave New World

Michael E. McClure, Ph.D., Distinguished Alumnus

Chief, Organs and Systems Toxicology Branch, Division of Extramural Research and Training, National Institute of Environmental Health Sciences



Thank you Presidents Mendelsohn and Low, Dean Stancel and the Dean's Council of the Graduate School of Biomedical Sciences for the opportunity to share a few views of the state of biomedical research on the dawn of our entering the next millennium.

The GSBS Class of 2000 will step over the threshold into a professional world of vastly different potential than the horizon before me just 30 years ago. The knowledge we have gained in FUNCTIONAL GENOMICS—a field that touches every other field in the life sciences—will change the way we look at and live with every other person, animal, plant, bacteria and virus on this planet. For the first time, humans are able to extensively study, design, and build on a molecular level to such a degree that we will soon be able to directly and deliberately influence our own evolution and that of the other species with which we share this earth. The 21st century poses considerable challenges for the next generation of biomedical scientists in carrying us further toward sustainable development of our species, the other species upon which we depend, and the environment in which we live. How we do this as a nation will be the major test of our humanity in the next century.

It is stunning to realize that on an earth that is hundreds of billions of years old, where life has been evolving for at least 500 millions of years, that modern mankind, a relative late-comer in the relatively short span of about 300,000 years has grown from two individuals—mitochondrial Eve and centrosomal Adam—to multiple billions and become wholly dominant of the earth, its resources, and its co-habiting life forms. To add perspective to this "short span," if the age of the earth were compressed into a 24-hour day, we modern humans would have lived as a species for about three seconds. Even more strikingly, the age of literacy that launched science as a tool of mankind has existed for a mere 3.5 milliseconds. In this "eyeblink" of evolutionary time, science has conferred upon man a power over life forms that lies outside the jurisdiction of natural laws of evolution—a power that may soon enable such laws to be rewritten by man to suit himself. This is the promise of the year 2000 as we move through the transition between the old age of GENETICS and the new one of GENOMICS.

By the year 2030, one-quarter of the U.S. Population will be over the age of 65. Life expectancy by the year 2040 is predicted to be 76 for men and 84 for women. Changing aspects of our reproductive strategy and life expectancy raise new medical challenges for the prevention and treatment of aging-related diseases arising from the expression of individual genetic susceptibilities that may be triggered or exacerbated by adverse environmental factor exposures in an increasingly adverse environment. Medically speaking, we are rapidly approaching the age of GERIATRIC GENOMICS.

Alexander Pope in his work entitled "Essays on Criticism" states two truths that I have held in memory since I read them. The first is, "The best study of man, is man himself," and the second is "Drink deep or taste not of the Pierian spring for shallow thoughts intoxicate the brain and drinking deeply sobers us again." These thoughts reflect the two most important aspects of life science research for our human population in the next century. First, what post-genomic "studies of man" should be developed to better the human condition, i.e., the medical biotechnology aspect, and second, what shouldn't be done with it, i.e., the bioethics aspect.

It is now estimated that at least 6 billion souls live together on this earth in the year 2000. Indeed, the UN announced that the first identified "Y6B" baby was born on October 12, 1999. The UN Population Fund Annual 1998 Report states that the number will be about 9.4 billion by 2050. At the rate estimated, we are newly adding 174 people to the earth every minute. The impact of the growth of the human population is already seen in the increasing demand for consumable resources and the increasing depletion of the variety of available resources. From the 6 billion souls here in 2000, there will be generated a sufficiently increased global population quantity to visibly stress the carrying capacity of the earth in our not too distant future. There will be an increasing impact of unsustainable consumption issues that forces substantial lifestyle changes and choices. Science will be once again put to the test in finding solutions for achieving sustainable de-

velopment.

Human population growth effects also have been linked to a substantial loss of biodiversity-the accumulated wealth of the diverse plant and animal species that share this earth with us. Of particular note is that the closest genetic primate to ourselves on this planet, chimpanzees, whose DNA differs from ours by about 1.5%, are globally diminishing in numbers at an alarming rate. The chimpanzee like many other feral species lives in areas increasingly encroached upon by the developing resource needs of mankind. What secrets of our own primate history will disappear with the chimpanzee? As elegantly expressed by Jonathan Marks in his recent article entitled *98% Alike* "— It isn't too hard to tell Jane Goodall from the chimpanzees she studies. She is the one with the long legs, short arms, prominent forehead, whites in her eyes and a significant amount of hair only on her head. She is the one who walks, talks, ciphers and wears clothing. All of these traits of Goodall arise from the 1.5% of the DNA difference between them…and this defines a colossal mystery yet to be solved."

Of perhaps greatest concern for the future are the population and environment issues of public health to be resolved from 2000 onward. Being placed in a circumstance where our population members are forced by the pressure of increasingly reduced vital resources to choose between longevity of life or controlled birth rates, either voluntarily or by coercion, seems an adequate enough reason to vigorously continue federal support for population and environmental health sciences research. It does not seem unreasonable to expect a second revolution in these research areas built on the new principles of genetic medicine that are only now beginning to unfold. It has, in fact, already begun.

What are these new tools of genetic medicine?

The federal Human Genome Project will conclude its effort to sequence a human genome in 2003 if the current schedule holds. The known sequences for the 100,000 or so genes that comprise the human genome will permit genetic studies of a molecular complexity previously impossible to do. From these 100,000 genes, there could be 20 to 100 million protein forms. We only know the function of about 5000 proteins at present and the future holds much exploratory work in increasing this number. It was reported recently that pilot microarray chips holding over 400,000 probes have been prepared. With such a powerful tool, one will be able to measure changing patterns of gene activity over the period of time that a cell undergoes a critical differentiation step or physiological function. Super gene chips will make it possible to observe the gain or loss of genetic function and predict susceptibility to biological changes such as those induced by a drug, chemical or environmental toxicant. Chip-based studies on the earliest cells, that direct our growth and development—stem cells—will permit studies on the cascade of sequential gene expression changes that are required to develop a specialized cell, e.g., a heart muscle cell, and define the role of signaling messenger molecules in directing the unfolding developmental program. With such knowledge, the bioengineering of the unique tissues of our bodies will become feasible.

Over the next decade, rapid advances will be made in harnessing the power of computerized bioinformatic protocols to process the massive data processing needed to analyze DNA microarray chip patterns presenting complex polygenic gene expression profiles—a genetic signature—for an individual's unique physiological or pathophysiological status. Real-time multidimensional gene expression microarray analyses for organ or tissue functional status will be able to be analyzed in time spans feasible for efficient use in research and clinical applications. Pilot accomplishments in this area have already been reported this year. This genomics approach will also interface with the new field of COMBINATORIAL CHEMISTRY AND PROTEOMICS. On earth today there are about 100 million species with an average of perhaps 100,000 genes per species, so the total protein diversity in the biosphere is about 100 trillion kinds of proteins. It is now possible to make 100 trillion random proteins simultaneously in a test tube all at once to screen them for potential drug, vaccine or enzyme products. Combinatorial chemistry is going to provide the molecular tools that we need to find specific proteins in specific ways that have specific activities.

How will these new technologies be applied to public health problems?

In the immediate future of genetic medicine we will see PHARMACOGENETICS mature as a field and provide health care specialists with the ability to evaluate the effect of interindividual genetic variation on drug efficacy and safety. The day will come when a patient will present their credit card-sized individual gene chip identification card to a practicing physician for an in-office evaluation of side effect risks for the pharmaceutical drug he/she is prescribing. The day is dawning when the field of PHARMACOGENOMICS will provide health care scientist-clinician teams specialized in the selection of optimum treat for individual patients based upon that individual's genetic or expressed molecular product profile. In the environmental health area we will see the newly emerging field of TOXICOGENOMICS develop approaches to monitor for and treat the effects of toxic environmental agent to factor exposures before such exposures can trigger or adversely influence an exposure-linked disease. The future of genetic medicine-based health care lies in the intersecting teamwork of professional scientists skilled in diagnostic, therapeutic and information sciences.

Given the "Geriatric Genomics" prediction and its linkage of environmental exposure, genetic susceptibility and extended time for expression, we can expect to see a "greening" of biomedical research. In the terminology of Vice President Al Gore, that is to say, research aimed at the development of clinical applications for the intervention and prevention of environmentally caused or exacerbated morbidity and mortality.

The genomic technology will provide the tools for toxicogenomic approaches to develop the means to: 1) Identify genetically susceptible individuals at risk of defined toxicant effects. 2) Block the ability of environmental toxins to cause damage by therapeutically activating toxin-binding proteins in susceptible individuals. 3) Therapeutically speed up the rate that naturally occurring enzymes detoxify substances. 4) Enhance the ability of the human body to actually repair environmentally damaged DNA.

It is only when the public realizes how relevant a science event is to their lives that scientists have an easy time bridging the gap to the national consciousness. We can expect that genetic medicine, functional genomics and tissue engineering will burst upon the national lay consciousness in the next decade. We face a critical communication challenge in bridging science and the citizen. Although stem cell and cloning research has been around for some time in science, it has only become an issue at the level of the national consciousness over the last several years.

By way of example, consider animal cloning, which was the great event of the 20th century by many accounts, and it evoked an extraordinary societal reaction to a science outcome that is only rarely seen. The birth of Dolly provoked worldwide discussions and a plethora of reactions ranging from panic to euphoria. The technology has become like the sorcerer's broom, taking on a life of its own beyond the control of the practitioners of the technology.

The rapid progress reported for the technology with monkeys and mice further raised the public consciousness of the prospects for cloning of genetically modified animals, including, possibly, The HUMAN. The human cloning prospects generated an immense socio-political response ranging from congressional hearings and national legislation to more than 40 legislative bills at the state level and the signed agreement reached by 19 countries regarding prohibitive policies toward human cloning. Public reporting in newspapers and magazines on cloning exploded worldwide. Scores of new books were published which added to available books and created a publisher's list total of 101 as of January 1999, including Danielle Steele's book The Clone and I. From the time of Gina Kolata's first post-Wilmut book entitled Clone in 1998, fourteen technical books have appeared, the last in March 2000, ironically, being that of Ian Wilmut, the cloner of Dolly. Including "Mini-Me" in *The Spy Who Shagged Me*, human clones were prominently feature in the six movies made in this period which joined the prior list of 32 dating from 1935-1998. Music about clones was issued (Fear Factory eight-song special cassette tape). Made for TV movies appeared (*Cloned*). Even "la femme Nakita" was almost cloned. Hundreds of web homepages appeared with some, like the USA Weekend WebPages, surveying public opinion by soliciting votes for or against human cloning and others for educating children on the techniques. All this, not to mention the hundreds of published cartoon artworks and numerous advertising commercials referencing cloning made it the social science- or science social event of the year.

Human clones have existed throughout mankind's history, they are monozygotic twins. My father was a clone and I bear the genes of a clone in my own body. We need not await the appearance of human clones in society that are produced by human technology since, in fact, they are here. Assisted reproductive technology has apparently been actually producing human clones for several decades now. Dolly and the dozens of cloned animal reports that followed her brought to the public mind a clear understanding of the potential use of nuclear genomic reprogramming or directed genomic programming to agricultural, pharmaceutical and medical applications. These are leading areas of research today with eminent commercial impact.

Just to consider two of these potentials it is interesting to note that the trade in **human drug proteins** produced by a transgenic cow, sheep or goat is a potentially multi-billion dollar business. Cloning can shorten the time required to generate a production herd by eliminating the slow process of building a herd by conventional animal husbandry technology. A small-cloned herd of such goats could easily supply the world's need for the protein drug. A second potential, currently embroiled in national debate and a focus of congressional infighting linked to the next NIH Research Budget, is that of **stem cell research** with its prospects for an industry with a multi-billion dollar annual market. The emergence of technology to control the nuclear programming of stem cells will yield specialized cells for the cell therapy of certain diseases like Parkinson's disease or diabetes. It will also lead to technology for spinal cord and nervous tissue damage repair, as well as fuel research in tissue engineering for treating clinical disease or tissue or organ injury that is beyond cell therapy.

The closing of the genetic century heralds the beginning of the genomic century. It is here and we are in it. The transition has ushered in new challenges to science for ensuring the means of our living and reproducing responsibly in a healthy global relationship with each other and the environment. The means are at hand and the hands that will apply them are the young investigators graduating from our nations' graduate schools this year.

In closing, I would like to thank the early GSBS Faculty, all remembered but too numerous to mention, of that ancient era of my graduate education in the GSBS in the 1960's. This was the defining moment in my professional life. It was then and there that the awakening occurred that opened my eyes, my mind and my heart to the realities of health science research as a career. The booming Texas Medical Center environment of that era, and the UT-GSBS in particular, provided a panoply of exciting scientific training and research opportunities. The education, training, and experience I gained during my time with the UT-M.D. Anderson Hospital and Tumor Institute endowed me with the means to find my place in science. It served me very, very well in supporting my career, and the choices I was able to exercise in its subsequent directions.

There is a Chinese saying: "The journey of 10,000 steps, begins with one step." Each of you in the Class of 2000 shares one thing with me in that regard. That one thing is that our first professional mentor placed us on the path and walked with us as we began our professional journey. I would, in this regard, particularly like to acknowledge, with my sincerest gratitude, that the first steps on my 10,000 step career journey resulted from Dr. T.C. Hsu extending to me the privilege of working with him as a GSBS student at the M.D. Anderson Hospital and Tumor Institute. His mentorship and that subsequently received from Drs. Darrell Ward and Lubomir Sedonius Hnilica provided the strong shoulders upon which I stood as I made my contribution to the betterment of science and its public health applications. In our time in science, Dr. Hsu and I have gone from an environment of science that was struggling to accurately count chromosomes to an environment that just recently was able to count the number of genes on chromosomes 21 (225) and 22 (545), and map their locations. We have seen in this time a technology change from simple film-covered glass slide autoradiography to the development of complex multidimensional DNA microarray technology for analyzing the symphonic concert of simultaneous gene expression patterns in normal and diseased cells and tissues. It has been a trip beyond my wildest expectations when I took that first step at the GSBS in 1963. How I envy the members of the Class of 2000 the journey that they are beginning today. In your journey, and from the place in science you will find, you will see the promise of both yesterday's and today's science unfold into biomedical and medical applications undreamed of as recently as a few years ago. I hope each of you, the graduates of the GSBS Class of 2000, has a journey as rewarding as mine has been.

T. C. Hsu,

Excerpted 6/13/00. Complete text available, (713) 500-9865.

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GSBS CLASS OF 2000

Master of Science

Edgardo Alicea (Robert Newman, Ph.D.)
Crotoxin: Membrane Damage and Cell Injury In Ovarian Cancer Cells

Brett Anderson (Constantin Ioannides, Ph.D.)
Activation Requirements of Peripheral CD8+ Cells by a Tumor Peptide, E75, HER-2 (p369-377)

Christopher Baird (George Starkschall, Ph.D.)
Dosimetry of Large-Breasted Patients Utilizing Compensating Filters

Michael Bieda (John Antolak, Ph.D.)
A Monte Carlo Method for Commissioning Electron Beams

Shannon Bragg-Sitton (Edward Jackson, Ph.D.)
Assessment of the Reliability and Reproducibility of Functional Magnetic Resonance Imaging for Selected Cognitive Tasks

Anna Ruth Carr (Stephen Daiger, Ph.D.)
Identification and Screening of Candidate Genes for Inherited Eye Diseases

Saleen Chenevert (Linda Cooley, Ph.D.)
Identification of New Chromosomal Aberrations as Prognostic Indicators for Pediatric Acute Lymphoblastic Leukemia

Yeng-Nee Chu (Reuben Lotan, Ph.D.)
Induction of Apoptosis in Human Bladder Transitional Carcinoma Cells by the Synthetic Retinoid CD437

Anthony Costa (Theresa Koehler, Ph.D.)
Bacteriophage TP21: Studies of Generalized Transduction in Bacillus cereus Group of Species and Physical Analysis of the Genome

Andrea Crabtree (Gary Gallick, Ph.D.)
Overexpression of c-Src in the SW480 Colon Tumor Cell Line Decreases Migration and Increases Invasion

Lei Deng (M. Tien Kuo, Ph.D.)
2-AAF Up-regulates Rat mdr1b Expression Through Generation of Reactive Oxygen Species that Activate NF-6B

Angela Gibson (Dana Hardin, M.D.)
Identification and Therapy Efficacy of Type 2Y Diabetes in Hispanics

Hannah Johnson (James Reuben, Ph.D.)
Interferon-Alpha Restores Cellular Immune Function of Chronic Myelogenous Leukemia Patients

Ni Lu (Benoit de Crombrugghe, M.D., Agrege)
Structure/Function Analysis of the Transcription Factors L-Sox5 and Sox6

Weiqin Lu (Wallace McKeehan, Ph.D.)
Fibrolast Growth Factor-10: A Second Candidate Stromal to Epithelial Cell Andromedin in Prostate

Wen Luo (Malcolm Winkler, Ph.D.)
Regulation of Pyridoxal 5'- Phosphate Biosynthesis in Escherichia coli K-12

Warren McClure (Frank Booth, Ph.D.)
AUF1 Protein Concentration and Binding Activity in Skeletal Muscle are Exercise Responsive and Fiber Type Dependent

Robert Meade (Peter Gascoyne, Ph.D.)
Dielectric Characterization of c-Src Antisense Transfected HT29 Cells

Roselina Montoya (Marsha Frazier, Ph.D.)
Perillyl Alcohol Activity on N-Nitrosobis (2-Oxopropyl) Amine-Induced Pancreatic Cancer in the Syrian Golden Hamster

Werner Montross (Pierre McCrea, Ph.D.)
A $-Catenin/Engrailed Chimera Selectively Suppresses WNT Signaling

Erin Mooney (Pierre McCrea, Ph.D.)
Cadherin Juxtamembrane Construct Generation: Strategies for Studying Cadherin-Based Structures and Adhesion

Sarah Nemanic (Jocelyne Bachevalier, Ph.D.)
The Effects of Selective Hippocampal Lesions on Two Tasks of Recognition Memory in Adult Rhesus Monkeys

Amie Ortman (Rebecca Pentz, Ph.D.)
Development and Evaluation of an Educational Videotape for Individuals at Risk for an Inherited Predisposition to Cancer

Brian Pavey (Frank Booth, Ph.D.)
The Isolated Skeletal Muscle Incubation System Is Not Suitable for Studying LPL mRNA Decay in Incubated White Vastus Lateralis and Soleus Muscles

Leslie Rogers (Ann Killary, Ph.D.)
Classification of Renal Cell Carcinomas Using cDNA Microarrays as an Alternative to Current Classification Methods

Martha Sandoval (Varsha Gandhi, Ph.D.)
Alterations in the Expression of Ribonucleotide Reductase Induced by DNA Damage in Human Chronic Lymphocytic Leukemia Cells

Qin Sheng (Malcolm Winkler, Ph.D.)
Construction and Physiological Study of D-1-Deoxyxylulose-5' -Phosphate Synthase Mutant in Escherichia coli K-12

Tong Sun (Ralph Arlinghaus, Ph.D.)
Bcr Phosphoserine and Phophotyrosine Specific Antibodies and Their Application in Bcr-Abl/Bcr Interaction

Stacia Vaughn (Jacqueline Hecht, Ph.D.)
Mapping of the Progressive Diaphyseal Dysplasia (Engelmann Syndrome) Locus to a 6cM Region on Chromosome 19q 13.2.

Debra Wallis (Dianna Milewicz, M.D., Ph.D.)
Characterization of Fibrillin-1 Microfibrils in Scleroderma

Bruce Williams (Richard Clark, Ph.D.)
Agonist-Induced Down-Regulation of the $2 Adrenergic Receptor

Jingyong Zhao (Malcolm Winkler, Ph.D.)
Overexpression of MutL and MutS Suppresses the GC÷TA Transversion Mutations in Nutrient - Limited Escherichia coli K-12

Bing Zheng (Grady Saunders, Ph.D.)
Characterization of a Human PAX6 Gene Enhancer

Doctor of Philosophy

Sandeep Agarwal (Gailen Marshall, M.D., Ph.D.)
Role of CD28/B7 Costimulation in the Type-1/Type-2 Cytokine Alterations by Dexamethasone

Larry Anderson (Craig Mullen, M.D., Ph.D.)
Tumor Immunization Strategies for Enhancing the Graft-Versus-Tumor Activity of Allogeneic Bone Marrow Transplantation

Laura Angelo (Razelle Kurzrock, M.D.)
Constitutive Expression of Interleukin-6 in Renal Cell Carcinoma is Modulated by p53

Nelson Arango (Richard Behringer, Ph.D.)
In Vivo Definition of Genetic and Cellular Aspects of Mammalian Sexual Differentiation

Philip Bergman (Catherine O'Brian, Ph.D.)
Effects of Butyrate on the Colon Cancer Cell Phenotype-Chemosensitization and Upregulation of Proteins Implicated in Cancer Progression

Weimin Bi (Benoit de Crombrugghe, M.D., Agrege)
Functional Analysis of Sox9 in Chondrogenesis by Targeted Gene Inactivation

Zhanyong Bing (Warren Liao, Ph.D.)
Transcription Factor SEF: Purification and Functional Characterization

Tracy Blevins (Roger Barber, Ph.D.)
The Two State Model of Receptor Activation: The Agonist and the Efficacy

M. Gabriella Bowden (Heidi Kaplan, Ph.D.)
The LPS O-Antigen id Required for Myxococcus xanthus : Social Motility and Multicellular Development

Eva Caudell (Elizabeth Grimm, Ph.D.)
Purification and Cloning of the Novel Phosphoprotein Copine III and Characterization of its Associated Kinase Activity

Siew-Sim Cheah (Richard Behringer, Ph.D.)
Analysis of Lim1 LIM Domains in Mouse Development

Belisa Diaz (Gabriel Lopez-Berestein, M.D.)
A Distinct Element Involved in the Lipopolysaccharide Activation of the Tumor Necrosis Factor-" Promoter in a Promonocytic Cell Line, THP-1

David Fenyes (Ponnada Narayana, Ph.D.)
Diffusion Tensor Imaging of Rat Spinal Cord In vivo

Margaret French (Daniel Carson, Ph.D.)
A Study of the Biology of Perlecan

Chuan Gao (Jon Wiener, Ph.D.)
The Effect of Protein Tyrosine Phosphatase SHP1 on Tumorigenicity of the MDA-MB231 Breast Cancer Cells

Weidong Jiang (Margaret Kripke, Ph.D.)
The Role of p53 in Skin Cancer Induction by UV Irradiation and as a Potential Tumor Antigen in UV-Induced Murine Skin Tumors

Kwang-Hwan Jung (John Spudich, Ph.D.)
Protein-Protein Interaction Between Phototaxis Receptor Sensory Rhodopsin I and its Transducer HtrI

Quinn Kleerekoper (John Putkey, Ph.D.)
NMR Structural Analysis of Cardiac Troponin C: Monitoring Conformational Changes Induced by Binding Calcium, Troponin I, and Calcium Sensitizing Drugs

Hilde Lechner (John Byrne, Ph.D.)

Behavioral and Cellular Analysis of Classical Conditioning of Feeding Behavior in Aplysia

Wei-Ping Lee (Mien-Chie Hung, Ph.D.)
AXL-GAS6 Signaling Counteracts Adenovirus 5 E1A-Mediated Cell Growth Suppression and Proapoptotic Activity

Shiaw-Yin Lin (Mien-Chie Hung, Ph.D.)
Two Prognostic Factors in Breast Cancer: Novel Functions of EGFR and $-Catenin

Bin Liu (David Young, M.D., Ph.D.)
Characterization of Anti-Sulfatide Autoantibodies in Demyelinating Diseases

Amy Loercher (Ralph Freedman, M.D., Ph.D.)
The Effects of IL-10 Producing Monocytes on T-Cell Activation in Patients with Epithelial Ovarian Cancer

Xiaolan Ma (William Margolin, Ph.D.)
Genetic and Functional Analysis of Cell Division Proteins FtsZ and FtsA in Escherichia Coli

Jeanelle Martinez (Lovell Jones, Ph.D.)
Developmental Effects of Estrogen and PCBs in the Reproductive Tract of BALB/C Mice

Steven McCullough (Richard Wendt, III, Ph.D.)
A Novel Treatment Planning Methodology for High Dose ^{166}Ho-DOTMP Marrow Ablation Therapy in Patients with Multiple Myeloma

Javier Medina (Michael Mauk, Ph.D.)
Cerebellar Mechanisms for Motor Learning: Testing Predictions from a Large-Scale Computer Simulation

Jennifer Newcomb-Fernandez (Thomas Goka, Ph.D.)
Proteolytic Mechanisms of Cell Injury Following Glucose-Oxygen Deprivation in Primary Neuronal Cultures

Mustafa Ozen (Sen Pathak, Ph.D.)
Delineation of a Novel Genetic Region at 5q11 Harboring Tumor Suppressor Gene(s) and Identification of the Telomeric DNA as a Marker for Human Prostate Cancer

Bulent Ozpolat (Lawrence Lachman, Ph.D., M.B.A.)
Development of a Protective Vaccine Against Helicobacter pylori

Hariyadarshi Pannu (Vicki Huff, Ph.D.)
Identification and Characterization of Cellular Genes Differentially Expressed in a Subset of Wilms Tumor with Nonfunctional WT1

Michael Pearlman (Dr. Emil Freireich, M.D.)
The Mechanism of the Pharmacological Actions of Dexrazoxane on Different Tissue Types

Bastianella Perazzona (John Spudich, Ph.D.)
Role of Transducer Proteins in Phototaxis Signaling of Halobacterium salinarum

Johnny Perez (Barry Kahan, M.D., Ph.D.)
Tolerance of Allografts Across MHC Barriers by Allochimeric Class I MHC Proteins

Usman Qazi (James Stoops, Ph.D.)
Structural Studies of Proteinase Entrapment by Human"$_2$-Macroglobulin Using 3-D Electron Microscopy

Brinda Rana (Wen-Hsiung Li, Ph.D.)
Selection at the MC1R Locus: Contribution to Human Pigmentation Variation

Yongsheng Ren (Warren Liao, Ph.D.)
Transcriptional Repression of Serum Amyloid A1 by AP-2 Contributes to its Liver-Specific Expression

Andrei (Andrew) Rodin (Yun-Xin Fu, Ph.D.)
New Algorithms for Automated Phylogenetic Reconstruction Using Artificial Intelligence and Data Mining Techniques

David Schmitt (Stephen Ullrich, Ph.D.)
Dual Role of Interleukin-12 on Ultraviolet-Induced Immune Suppression

Jonathan Stein (Jacob Kagan, Ph.D.)
The Localization and Identification of Candidate Tumor Suppressor Genes Involved in Prostate Cancer on Chromosome 8p

John Renn Su (Jeffery Jones, Ph.D.)
Variables Affecting the Stability of Multiple Cloning Sites and Hairpin Structures in Retroviral Vectors

Gulshan Sunavala (Michael Van Dyke, Ph.D.)
Searching for the Ideal DNA Recognition Code of Covalent Ligands

Ming Tan (Dihua Yu, M.D., Ph.D.)
The Role of ErbB2 Receptor in Human Breast Cancer Metastasis

Chadwick Thompson (Henry Strobel, Ph.D.)
Cytochrome P450 2D18 in the Mammalian Brain: Recombinant Expression, Purification, and Characterization of Xenobiotic and Endobiotic Metabolism

Jay Vivian (William Klein, Ph.D.)
Use of a Hypomorphic Allele of Myogenin to Analyze Myogenin-Dependent Processes in Mouse Development

Sung-Ling Wang (Guillermina Lozano, Ph.D.)
A Novel DNA Damage Inducible Inhibitor of p53

Anjanette Watson (Sharon Roth, Ph.D.)
Elucidation of Chromatin Mediated Tup1-Ssn6 Repression

Yun Wu (Ralph Arilinghaus, Ph.D.)
Bcr: A Conditional Inhibitor of Bcr-Abl Oncoprotein

Lixuan Xu (Marsha Frazier, Ph.D.)
Molecular Basis of Hereditary Nonpolyposis Colorectal Cancer (HNPCC): Mutation Analysis and DNA Methylation Study

Lei Xu (Isaiah Fidler, D.V.M., Ph.D.)
Ovarian Cancer Angiogenesis, Biology and Therapy

Nianhua Xu (Ann-Bin Shyu, Ph.D.)
Mechanism of mRNA Stability Control Mediated by Au-Rich Element: Characterization of Cis-Element and Trans-Factor

Jianhua Yang (Bing Su, Ph.D.)
Biochemical and Genetic Analysis of Two Protein Kinases JNKK2 and MEKK3

Vivian Wei-Chung Yang (Magnus Höök, Ph.D.)
Interactions and Structural Analysis of the Zinc-Binding Motif in Decorin, a Small Leucine-Rich Proteoglycan in Extracellular Matrix

FACULTY MEMBERSHIP COMMITTEE REPORT

MEMBERS APPOINTED WITH COMMENDATION

Katherine A. Borkovich, Ph.D.
Peter J. Christie, Ph.D.
William Dowhan, Ph.D.
Mien-Chie Hung, Ph.D.
Jacob Kagan, Ph.D.
Samuel Kaplan, Ph.D.
Raymond E. Meyn, Jr., Ph.D.
Dianna M. Milewicz, M.D./Ph.D.
Stephen E. Ullrich, Ph.D.

NEW REGULAR MEMBERS:

Lynne V. Abruzzo, Assistant Professor, Department of Hematopathology, M.D. Anderson Cancer Center. Ph.D., M.D., University of Chicago, 1984, 1986. Research interests: hematopathology

Francois X. Claret, Assistant Professor, Department of Molecular Therapeutics, M. D. Anderson Cancer Center. Ph.D., University of Lausanne, 1993. Research interests: signal transduction in cancer; JNK/SAPK activation; cellular proliferation and oncogenic transformation; JAB1 in cell cycle control and ubiquitin/proteasome signaling pathway; apoptosis (Fas/FasL)

Jiale Dai, Assistant Professor, Department of Molecular Pathology, M. D. Anderson Cancer Center. Ph.D., University of Miami School of Medicine, 1997; M.D., Shanghai Medical University, 1989. Research interests: tumor suppressor genes; oncogenes; gene expression profiles; signal transduction; TGF-beta

Patrick M. Dougherty, Associate Professor, Department of Anesthesiology, M. D. Anderson Cancer Center. Ph.D., UT-Houston GSBS, 1988. Research interests: neurobiology, neurophysiology and neuropharmacology of the spinal dorsal horn; forebrain mechanisms of somatosensation and hyperalgesia; mechanisms of central pain; neural mechanisms of hyperalgesia, chronic fatigue and cognitive impairment due to cancer and cancer therapies; psychophysics and functional imaging of acute, neuropathic and cancer pain in humans

Zhen Fan, Assistant Professor, Department of Experimental Therapeutics, M. D. Anderson Cancer Center. M.D., Shanghai Medical University, 1985. Research interests: apoptosis; growth factors; signal transduction

Jeffrey A. Frost, Assistant Professor, Department of Integrative Biology and Pharmacology, UT-Houston Medical School. Ph.D., University of California at San Diego, 1993. Research interests: signal transduction; small GTP binding proteins; protein phosphorylation; cell proliferation and transformation

James E. Hixson, Professor, Department of Human Genetics Center, UT-Houston School of Public Health, Ph.D., University of Michigan, 1983. Research interests: molecular genetics; genetics of common disease; gene structure and expression in atherosclerosis

Jean Pierre Issa, Associate Professor, Department of Leukemia, M. D. Anderson Cancer Center. M.D., The American University of Beirut, 1987. Research interests: DNA methylation in normal and neoplastic cells; molecular biology of aging and cancer; tumor-suppressor genes; epigenetic silencing

W. David Jarvis, Assistant Professor, Department of Integrative Biology and Pharmacology, UT-Houston Medical School. Ph.D., University of Virginia Graduate School of Arts and Sciences, 1992. Research interests: cancer cell biology; leukemia; lymphoma; apoptosis; lethal stress signaling; lipid messengers; molecular pharmacology and experimental therapeutics

Khandan Keyomarsi, Associate Professor, Department of Experimental Radiation Oncology, M. D. Anderson Cancer Center. Ph.D., University of Southern California (Los Angeles), 1989. Research interests: breast cancer; cell cycle control; molecular targeting; drug targeting; estrogen receptor; experimental therapeutics

Yahuan Lou, Associate Professor, Department of Basic Sciences, UT-Houston Dental Branch. Ph.D., Hokkaido University, 1990. Research interests: autoimmunity; cellular and molecular immunology; animal models for autoimmune disease; T cells and autoantibody; inflammation

Gregory S. May, Professor, Department of Pathology and Laboratory Medicine, M.D. Anderson Cancer Center. Ph.D., Yale University, 1984. Research interests: cell motility; class I myosin; mitosis; cell cycle; chromosome structure

Jeffrey J. Molldrem, Assistant Professor, Department of Immunology, M. D. Anderson Cancer Center. M.D., University of Minnesota, 1990. Research interests: tumor immunity; transplant immunology; T cell tolerance mechanisms

Renata Pasqualini, Associate Professor, Department of Genitourinary Medical Oncology, M. D. Anderson Cancer Center. Ph.D.,

University of Sao Paulo, 1990. Research interests: polymeric fibronectin as an anti-cancer agent; vascular targeting; vascular biology and angiogenesis regulation; au integrin signaling in angiogenesis; a new approach for the immunodiagnostics of breast cancer by random peptide phase display

Felipe Samaniego, Assistant Professor, Department of Lymphoma/Myeloma, M.D. Anderson Cancer Center. M.D., Harvard Medical School, 1983. Research interests: transformation mechanism in viral related cancers; human herpesvirus 8 in lymphoma and Kaposi's sarcoma; angiogenesis

Anne B. Sereno, Assistant Professor, Department of Neurobiology and Anatomy, UT-Houston Medical School. Ph.D., Harvard University, 1991. Research interests: attention; short-term memory; eye movements; visual cortex; primates; electrophysiology; schizophrenia; Parkinson's disease

Duen-Hwa Yan, Assistant Professor, Department of Surgical Oncology, M.D. Anderson Cancer Center. Ph.D., UT-Houston GSBS, 1991. Research interests: cancer gene therapy; gene expression; translational regulation; HER-2/neu; p202; BRCA2

Pierre Zoldhelyi, Assistant Professor, Department of Internal Medicine, UT-Houston Medical School. M.D., University of Padua, 1985. Research interests: medicine; cardiology; molecular biology; gene transfer and gene therapy

NEW ASSOCIATE MEMBERS:

Jaroslaw A. Aronowski, Assistant Professor, Department of Neurology, UT-Houston Medical School. Ph.D., Polish Academy of Sciences, 1992. Research interests: animal models of cerebral ischemia; neuroprotection; protein phosphorylation; transcription factors; inflammation; neuronal death

Charles Bloch, Assistant Professor, Department of Radiation Physics, M.D. Anderson Cancer Center. Ph.D., Michigan State University, 1987. Research interests: radiation physics; proton therapy; sterotactic radiosurgery

Bang-Ning Lee, Assistant Professor, Department of Laboratory Medicine, M.D. Anderson Cancer Center. Ph.D., University of Houston, 1993. Research interests: molecular virology; vaccine immunology; cellular and molecular immunology

Verna M. Rose, Assistant Professor, Department of Pediatrics, UT-Houston Medical School. M.D., Texas A&M University Health Science Center, 1988. Research interests: X-linked hypophosphatemic rickets; dysmorphology

William C. Satterfield, Associate Professor, Department of Veterinary Sciences, M.D. Anderson Cancer Center. D.V.M., Auburn University, 1969. Research interests: animal models; primates; large animals; farm animals; large animal surgical; toxicological, pharmacodynamic models; animal care and use regulations

Ratna K. Vadlamudi, Assistant Professor, Department of Experimental Therapeutics, M.D. Anderson Cancer Center. Ph.D., University of Wyoming, 1994. Research interests: growth factor signal transduction; bZip transcription factor ATF4; cell migration/metastasis; focal adhesion signaling; regulated exocytosis; P160 and ER signaling

Changping Zou, Assistant Professor, Department of Obstetrics, Gynecology and Reproductive Sciences, UT-Houston Medical School. M.D., Beijing Medical University, 1983; Ph.D., UT-Houston SPH, 1994. Research interests: cancer prevention; translational study on retinoids and other agents including biological agents in chemoprevention; development of a vaccine against human papillomavirus (HPV) infection, which will be used in cancer prevention

Alicia J. Dombroski, Ph.D. *(left)* **was named the John P. McGovern Outstanding Teacher for 2000 by the Graduate Student Association, here with GSA President Athanasia Panopoulos** *(right)*.

UT-H GSBS ALUMNI ASSOCIATION: ALL ABOARD!

Graduated in 2000? You're along for the ride. Graduated in 1969? You are too, as well as every graduating class in between. To start at the beginning of the Association, credit the Dean (and Dean's Council) for recommending an able Charter Steering Committee: Ann Killary, Ph.D. 1980; Maureen Goode, Ph.D., 1985; Ed Jackson, Ph.D., 1990; Ben Thomas, Ph.D., 1973; and Brenda Whaley, Ph.D., 1995. They in turn have elected officers (**Ann Killary, President; Maureen Goode, Vice President-Treasurer**) and organized by-laws. They also agreed that it is most important for the GSBS Alumni Association to be inclusive rather than exclusive in membership, which means a no-fee membership for all and a variety of benefits for each of you individually. Mark your calendar early for the inaugural GSBS Alumni Association Annual Meeting and Reunion Dinner Reception at the Houston Museum of Health and Medical Science on Saturday evening, 6-9 pm, October 14, 2000. This will be a terrific event (free of charge) and an opportunity for visiting with your colleagues and friends. In the meantime the Steering Committee is developing an interactive WebPage—but more about that later.

If you have news you would like to share, send it to me at lcarter@gsbs.gs.uth.tmc.edu or UT-Houston GSBS at P.O. Box 20334, Houston, TX 77225-0334. Telephone: (713) 500-9865; FAX: (713) 500-9877. Stay cool and see you in October!

Celebrating GSBS Commencement are left to right: graduate student Patty Wong; new graduate Leslie Rogers, Ph.D.; Alumni Association President, Ann Killary, Ph.D., 1980; Dawn Chandler, Ph.D., 1998; and Stephen Lott, Ph.D., 1997. (Killary was Advisor to Wong, Rogers, and Lott.)

NEWSLETTER
Editor: Linda Carter
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Address Correction Requested