

Faculty & Topics  
Marine Biological Laboratory  
Woods Hole, MA

- Alkon, Daniel  
“Memory”
- Andersen, Bruce  
“Squid Lab”
- Awad, Isaam  
“Scientific Method”
- Benowitz, Larry  
“Axonal Guidance and Regeneration”
- Bernstein, Kerry  
“The Microprocessor Chip’s Brain Metaphor’
- Bracken, Michael  
“Introduction to Evidence Based Neurosurgery”
- Brem,Henry  
“SPECIAL LECTURER:Brain Tumor Therapy”
- Connolly, Sander  
“Neuroinflammation and Adhesion Molecules”
- Constable,Todd  
“Cortical Plasticity in Humans”
- D’Amore, Patricia  
“Angiogenesis and Neoplasia”
- Dempsey, Robert  
“Project Design and Grantsmanship”
- Edgerton, Reggie  
“Repetitive Patterned Exercise Therapy”
- Friedlander, Robert  
“Programmed Cell Death”
- Gault, Judith  
“Introduction to Molecular Genetics”
- Galbraith, Jim  
“Squid Lab”
- Gunel, Murat  
“Signaling Pathways and Neural Cell Fate”

- Kondiolka, Douglas  
“Neurotransplantation”
- Khurana, Vini  
“Gene Therapy”
- Kristal, Bruce  
“Mitochondria in the CNS”
- McDonald, John  
“Stem Cells as Therapeutic Agents”
- Reese,Tom  
“History of the Marine Biological Laboratory”
- Rutka, Jim  
“Molecular Biology of Brain Tumors”
- Schwob, Jim  
“Neural Regeneration”
- Silver, Jerry  
“Glial Barriers and Scarring”
- Simard, Marc  
“Cerebrovascular Smooth Muscle Physiology”



Mission Statement

The Mission of the course Research Update in Neuroscience for Neurosurgeons (RUNN) is to provide an introduction to and update of the latest concepts, hypotheses and methods of neurobiology and neuroscience relevant to neurological surgery. These are presented by accomplished neuroscientists in an atmosphere emphasizing scientific rigor, highlighting models of career development for neurosurgeon-scientists, and illustrating potential future neurosurgical applications. A milieu of total immersion in scientific discourse is designed to foster creative discussions among neurosurgical trainees and faculty. The course is designed to stimulate neurosurgical trainees to participate in basic, translational, and clinical research relevant to the practice of neurological surgery.

Historical Background and Setting

The RUNN course was the brainchild of Henry Schmidek, formerly of Harvard University and the University of Vermont. The course was conceived in response to the anticipated expansion of neurosciences, which he predicted in the early 1980’s. The course was to combat what he perceived as potential illiteracy in basic neurobiology that he feared would weaken the specialty of neurosurgery.

As so many neuroscientists from New England, Dr. Schmidek was very familiar with the Marine Biological Laboratory (MBL) at Woods Hole, Massachusetts. Established in 1888 as a non-profit institution devoted to research and education in basic biology, the MBL has been called “the uniquely national center for biology in this country” (Lewis Thomas, The Lives of a Cell). Scientists and



students throughout the world come to MBL to conduct research, teach, study and collaborate. They often use the diverse and abundant organisms found in surrounding waters as model systems. Here research ships leave everyday to study the pristine waters around Martha’s Vineyard sound and to collect and maintain more

than 200 species of marine life. There are 230,000 square feet of research space, and a splendid library with an extraordinary repository of books and journals and incredible electronic connectivity to everything biological. It is here that the giant squid axon was (and continues to be) so closely studied unfolding the splendid story of molecular mechanisms of neural function. There are incredible microscopy facilities, numerous amphitheaters and teaching facilities, a quintessential scientific community in true life and work, and a magnificent setting for creativity and scholarly productivity. And there is Swope Hall, a simple dormitory sleepily straddling a quaint harbor, with a friendly staff that knows how to host students and scholars. It is all in Woods Hole, that lovely little spot and ideal gateway, along the magnificent coast of Cape Cod and nearby islands. With miles of bicycle trails and nearby ferries, the only competition to diligent scholarship at Woods Hole is the inspiring call of nature.

It is here that Henry Schmidek cast his RUNN course, and lobbied other residency program directors to send their trainees once a year. By the mid-1980’s it was an established offering for two weeks each fall, immersing neurosurgery residents from New Orleans to Saint Louis, from Minnesota to Maryland, and from San Francisco to New York city. The faculty included scientists from the MBL, demonstrating microscopy and dissection and scientists from New England universities who would drive to MBL for one or two days to participate in RUNN. There would also be neurosurgery’s rising academic stars as role models, and wiser icons telling their tales of successes and challenges in the laboratory.

There was nothing like it in neurosurgical education, and there still is not. The founding mission of the RUNN course remains relevant today, and its culture and milieu remain as appealing. This crown jewel of American neurosurgical education was adopted in the late 1980’s by the American Association of Neurological Surgeons (AANS) and later by the Joint Committee on Education of the AANS and the Congress of Neurological Surgeons (CNS). This endorsement and administrative oversight by organized neurosurgery heralded an era of expansion and uninterrupted success under the Directorship of Charles Hodge, of Syracuse, New York, with his lovely wife Cathy shepherding the Course as its coordinator. In the mid 1990’s Dr. Hodge became co-Director, passing the helm of Directorship to Cordell Gross, of Burlington, Vermont. In what has become a course tradition, Linda Gross served as Course Coordinator.

During this period, Charlie and Cordell cultivated a core of devoted faculty from the MBL, Syracuse, Vermont, Harvard, Brown,



Stimulating  
Science  
in a  
Unique Setting

RESEARCH UPDATE  
IN NEUROSCIENCE  
FOR NEUROSURGEONS  
(RUNN)  
NOVEMBER 9-16, 2003

Sponsored by:  
THE SOCIETY OF NEUROLOGICAL SURGEONS

Course Director:  
ISSAM AWAD

Co-Directors:  
BRUCE ANDERSEN, ROBERT DEMPSEY,  
ALLAN FRIEDMAN, CHARLES HODGE  
AND EDWARD OLDFIELD

Course Coordinator:  
CATHERINE AWARD



the National Institutes of Health (NIH), and other institutions who would participate on a regular basis as faculty. Many still receive the highest ratings from RUNN course attendees, and return again. Other RUNN attendees eventually became academic stars, and later leaders in neurosurgery and have become dedicated faculty. A requirement for faculty participation remains – that the individual be an active and accomplished scientist, speaking on topics he/she actively investigates, and that he/she be an effective speaker. Only those who are highly rated by the neurosurgical trainees would be invited again. Many would dazzle and inspire casting truly unforgettable lectures or discussions. The days would be filled with lectures, unhurried, with plenty of time for discussion. There would be long blocks of time for reading in the library, or for creative and vivid discussions with beer, wine and snacks late into the night. Friendships would be forged among attendees, and research ideas and even an occasional scholarly career would be hatched. All attendees stay at the dorm at Swope Hall, where the legendary cafeteria is like no other, and the views from each simple bedroom (many shared by two residents) as memorable.

Because of untimely illness in 1998 Dr. Gross asked to step down from the Directorship of the RUNN Course, which he had grown to love so much. The opportunity of change of leadership allowed a re-examination and re-commitment to the Mission and core values of the RUNN Course. The AANS and CNS asked the Society of Neurological Surgeons (SNS) to assume sponsorship and oversight of the course. Established in 1920 the SNS is known in neurosurgical lore as the “Senior Society” or organization of North American residency Program Directors. The SNS would insure Program Directors’ continued commitment to this unique educational offering, and ensure residents’ continued participation.



RUNN Course Leadership

Since 1999, the RUNN Course has been entrusted to the leadership of Course Director Issam A. Awad (of the University of Colorado), and Co-Directors Charles Hodge (of SUNY at Syracuse), Edward Oldfield (of the National Institutes of Health), Allan Friedman (of Duke University), Robert Dempsey (of the University of Wisconsin), Bruce Andersen (of the Idaho Neurological Institute) and Robert Friedlander (Brigham & Women’s Hospital). Dr. Andersen works closely with Jim Galbraith and Paul Gallant (both of the National Institutes of Health) on the squid lab and microscopy workshop. Course Coordinator, Catherine Awad, who works throughout the year to insure RUNN is executed flawlessly, carries out countless organizational, administrative and accounting tasks.

The 2003 RUNN Course Curriculum: Tradition and Innovation

The founding mission and core values of the RUNN Course remained unchanged for this year’s offering in 2003, and the SNS Executive Committee (representing North American Residency Program Directors) rearticulated its commitment to the course and its leadership.

In response to recent course evaluations and discussions with Program Directors and residents, the course was shortened in 1999 from two weeks to one full week with travel days on both weekends. This format will be maintained. The one and one half hour length of individual lectures remains unchanged and four evening sessions will continue to be held. Curriculum content has been reshaped to include lectures covering the spectrum of molecular, cellular and systems neuroscience. These include coverage of topics on molecular genetics, signaling and receptors, stem cells, cell death, regeneration, oncogenesis, glial barriers, vascular tone and phenotype, chaos theory, cognitive information science, circuit modeling, and higher cortical function. Approximately one third of the lectures are given by practicing neurosurgeons with active laboratories. There are focused tours of the MBL laboratories and the very popular microscopy seminar with hands-on dissection of squid giant axon (challenging the dexterity of the most agile young neurosurgeons!). There were discussions on academic career development, grantsmanship, history and philosophy of science and the scientific method, and history of the MBL. And there were the traditional opening get-acquainted reception and Course Orientation, and the farewell Clambake and certificate ceremony.

The 2003 Special Lecture was delivered by Henry Brem, M.D., Ph.D. Cushing Professor and Chairman of the Department of Neurosurgery at Johns Hopkins Hospital. He discussed his views on the treatment of malignant brain tumors. Dr. Brem also spent time with the course participants sharing his insights into academic career development and the feasibility of integrating world-class research with a stimulating and challenging clinical practice.



The collegial atmosphere at Swope Hall remained unchanged, as were the memorable late night sessions with snacks, beer and wine. We preserved several blocks of free time, and the extraordinary one on one interaction among faculty and attendees. Each attendee received a complementary copy of the 1,600 page textbook: Fundamentals of Neuroscience, edited by Zigmond, Bloom, Landis, Roberts, and Squire (Academic Press 1999), a magnificent reference to topics covered in the lectures, and an outstanding source of suggested reading.

A Splendid Cast of Faculty

The faculty and topics (see list) represented a virtual who’s who of American neuroscience. There were 22 faculty and 5 directors, representing an extraordinary student/faculty ratio of 2.7/1.0 (excluding course co-directors who did not lecture). Attendees were mesmerized by the dynamic speakers and a true realization of the splendid explosion of knowledge and possibilities. Many of the residents discussed personal choices in research commitments and career direction. Many faculty members had participated in the RUNN Course for several years, and all promised to come again if invited. The Course evaluations included countless constructive suggestions for next year. Individual faculty mean evaluation scores ranged 1.2 to 2.2 (scale 1-5, 1 best), with more than half scoring better than 2.0 (good), and none averaging a score of 3.0 (average) or worse.

An Enthusiastic Cast of Attendees

There were 55 attendees from 45 Programs (see list) representing programs throughout the United States, Canada and Puerto Rico. Our goal is to attract one neurosurgeon from each neurosurgical program in North America. We will work hard until we achieve representation of at least one participant from each North American Program. The future of the RUNN course is a catalyst towards that end.

Our participants continue to be enthusiastic. It is exciting to see the participants swept up into a top and engaging the lecturers with probing questions.

“At the end of the week we all felt a little bit smarter, a lot more up to date on the future of neuroscience, more connected with our peers, and most importantly, we realized that we are a part of an amazing group of people around the globe who are driven to take science and medicine into the new millennium.”

Matthew Chang, M.D., PGY-4  
Denver, Colorado - 2002

Josh Medow, M.D., PGY-4  
Madison, Wisconsin - 2002

Course Report by Lee Selznick, M.D.,

Resident Attendee  
Neurosurgical Resident, Duke University Hospital

As a resident attendee at the 2003 RUNN course, I wish to express in this report the profound impact that it will have on the rest of my career in neurosurgery. More than just a research update in neuroscience for neurosurgeons, the course is an introduction to some, a reminder to others, that the field we have chosen is an exciting and ever-changing academic pursuit. By assembling a diverse and enthusiastic faculty at the world-renowned Marine Biological Laboratory in beautiful Cape Cod, the RUNN course offers an inspiring opportunity to neurosurgical residents in the early stages of their careers.

The research update for 2003 included talks from world-renowned neurosurgeons and neuroscientists on some of the more recent discoveries shaping the current practice and future direction of clinical neurosurgery. Whereas some of the 60 to 90 minute talks were strictly on basic neuroscience, others were on translational research and career development. Basic science topics included a review of molecular genetics and a brief history of the research conducted at the marine biology lab, particularly the breakthrough work on the giant squid axon. Angiogenesis, apoptosis, axonal guidance, cortical plasticity, and the molecular biology of brain tumors were also covered. Of particular interest were talks given by leading scientist-physicians detailing their breakthrough work in the lab and how it applies to what they see in clinical practice. The ability of stem cells to regenerate in the injured spinal cord was discussed by John McDonald using Christopher Reeve as an illustrative case report. Mark Simard reviewed smooth muscle physiology as it applies to cerebrovascular disease. Gene therapy, convection-enhanced delivery, and a special lecture by Henry Brem on brain tumor therapy were particularly enlightening. Perhaps the best part was the relaxed atmosphere and opportunity to discuss academic career development with some of the leading neurosurgeons in the world. Robert Dempsey and Issam Awad lead an entire session devoted to project design and grantsmanship. Vini Khurana and Robert Friedlander offered invaluable advice for pursuing a career involving translational research in neurosurgery.

The social aspects were as valuable as the scientific ones. Friendships were quickly forged among residents with nights out at the local bar (Captain Kidd’s) and road trips into Boston. The RUNN course provided a golden opportunity for neurosurgical residents and faculty from all around the country to gather in an informal, yet collegiate environment. The enthusiasm of the faculty was infectious and made me think critically about the future direction of my career. Whether in a university setting or private practice, the field of neurosurgery is ever-changing, ever-improving; the impact of this course will be ever-lasting.

Generous Educational Grants

We acknowledge generous educational grants in support of the 2003 RUNN Course by Medtronic, the Idaho Neurological Institute and Codman. These contributed to subsidizing general operating costs, faculty travel, honoraria and the purchase of a reference textbook, Fundamentals of Neuroscience, for each participant.

Toward RUNN 2004 and Beyond!

We have finalized space contract with the MBL for the years 2004 through 2009. The RUNN 2004 will take place from October 30-November 6, 2004. The SNS and the Course Co-Directors and Coordinator are committed to maintaining the best of the RUNN Course, while continuing to strive to enhance curriculum content and value to each registrant. We continue to call on Residency Program Directors to support this unique gem of North American

Neurosurgical Education, by providing their residents the opportunity of exposure to, and update on the best of neurobiology. We hope that future courses will also attract fellows and young faculty at formative states of their academic careers, and to practicing neurosurgeons who want to get reacquainted with the future of neurosurgery!

RUNN Web Site  
<http://www.societyns.org>



Future Course Dates

Marine Biology Laboratory  
Woods Hole, MA

- October 30-November 6, 2004
- October 23-30, 2005
- October 21-28, 2006
- October 20-27, 2007
- October 18-25, 2008
- October 17-24, 2009

RUNN Course Attendees November 9-16, 2003

Participant	Institution
Amar, Arun	Yale University
Ames, Jeremy	Case Western Reserve
Ammerman, Josh	George Washington/NIH
Atteberry, Dave	Shelton University of Pittsburgh
Basta, Peter	St. Louis University
Bellew, Michael	Tulane University
Brown, Melandee	Columbia University
Boyce, Hayden	Henry Ford
Carlson, Jonathan	OHSU
Colen, Chaim	Wayne State University
Couture, Daniel	Wake Forest University
Den Haese, Ryan	University of Maryland
Dziurzynski, Kristine	University of Wisconsin
Eugh, Johnathan	University of Pittsburgh
Friedlich, Dan	Albany Medical Center
Gabikisan, Patrik	University of Washington
Gardner, Paul	University of Pittsburgh
Golan, Jeff	McGill University
Hain, John	Medical College of Georgia
Hua, Sherwin	Johns Hopkins University
Jamer, Robert	University of Maryland
Laxton, Adrian	University of Toronto
Leonardo, Jody	SUNY Buffalo
Lopez, John	University of Colorado
Lophia, Keith R.	University of Michigan
Liu, Kenneth	OHSU
Mai Ha, Tung	University of Kansas
Mandigo, Christopher	Columbia University
McKay, Natasha	Case Western Reserve
Miller, James	Indiana University
Mohan, Avinash	NY Medical College
Mukhida, Karim	University of Toronto
Nair, Nathan	University of Washington
Neckrysh, Sergey	University of Illinois-Chicago
Pichelmann, Mark	Mayo Clinic
Poisik, Alexander	Emory Clinic
Quebada, Patricia	Dartmouth
Rhiew, Richard	Wayne State University
Roberts, Richard	Louisiana State University
Sani, Sepehr	Rush University Medical Center
Schapiro, Robert	McGill University
Shafa, Bob	Loma Linda University
Selznick, Lee	Duke Universtiy
Sloffer, Chris	University of Ilinois College of Medicine Peoria
Thaiyananthan, Ty	Yale University
Thai, Quoc-Anh	Johns Hopkins University
Tobias, Michael	AECOM/Montefiore
Toledo, Maria	University of Puerto Rico
Toussaint III, L.Gerard	Mayo Clinic
Tullis, James	University of Mississippi
Velimirovic, Bratislav	Northwestern University
Walsh, Michael	University of Vermont
Wensel, Andrew	University of Rochester
Vandergrift, William	Medical University of South Carolina
Yao, Tom	Vanderbilt University