THE UNIVERSITY OF ARIZONA.
College of Medicine

Arizona Telemedicine Program's Dr. Ronald S. Weinstein Named UA Technology Innovator of the Year

Recognized for multiple companies, institutes and scientific instruments that he has created and been involved with throughout his career; recent innovations include changing the way health professionals are taught and how they provide health services, and a health-care curriculum for high school students. Joins five other AHSC faculty so honored since 2004.

Contact: Jean Spinelli, 520-626-7301

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Ronald S. Weinstein, MD, founding director of the **Arizona Telemedicine Program**, has been honored with the **2012 Technology Innovation Award** by the **University of Arizona**. The award was presented at the recent ninth annual Innovation Day luncheon, attended by more than 300 people.

UA Innovation Day celebrates technology development and commercialization by highlighting the research achievements of students, staff and faculty. Dr. Weinstein received the Technology Innovation Award, which is presented to an established UA researcher whose research findings have been commercialized in the form of a license, company-based enterprise or other publicly visible translation instrument. In addition to a commemorative plaque, Dr. Weinstein received $10,000 to be used for research-related activities.

Dr. Weinstein was recognized for his multiple companies, institutes and scientific instruments that he has created and been involved with throughout his prestigious career. Among his recent innovations, he said that the Arizona Telemedicine Program is trying to change the way health professionals are taught and how they provide health services. This approach includes a health-care curriculum he has developed for high school students.

Six Arizona Health Sciences Center faculty members have won the UA Technology Innovation Award in the past nine years. In addition to Dr. Weinstein, who is a professor of pathology at the **UA College of Medicine** and professor of public policy at the **UA Mel and Enid Zuckerman College of Public Health**, other AHSC winners are:

- **Evan C. Unger, MD, FACR** (2011), professor, radiology and bioengineering; director, body imaging, Department of Radiology, UA College of Medicine; co-director, Cancer Imaging Program, The University of Arizona Cancer Center.

- **Eugene W. Gerner, PhD** (2010), professor emeritus, cellular and molecular medicine, UA College of Medicine; director, Gastrointestinal (GI) Cancer program, The University of Arizona Cancer Center; professor, UA BIO5 Institute.

- **Victor Hruby, PhD** (2009), Regents Professor Emeritus, Department of Chemistry and Biochemistry, UA College of Science; professor, Arizona Research Laboratories; professor, UA Program in Neuroscience; professor, Department of Pharmacology, UA College of Medicine; professor, UA BIO5 Institute; member, The University of Arizona Cancer Center; founder, Selectide Corporation.

- **Laurence Hurley, PhD** (2007), professor, UA College of Pharmacy; Howard J. Schaeffer Endowed Chair in Pharmaceutical Sciences; professor, UA BIO5 Institute; member, The University of Arizona Cancer Center; founder, Cylene Pharmaceuticals.

- **Thomas M. Grogan, MD** (2004), professor emeritus, pathology, UA College of Medicine; founder, Ventana Medical Systems, Inc.; member, The University of Arizona Cancer Center.

More information is available at http://innovation.arizona.edu/winners.html

A video about Dr. Weinstein that was shown at the awards luncheon is featured at www.youtube.com/watch?v=xGn0pnnFjl4&feature=plcp&context=C46cf3aeVDvjVQa1PpcFODDJ50ZneilHfloiOYaa6SkVZR1HdpTVU%3D

Also presented at the luncheon was the **Student Technology Innovation Award**, which recognizes technology-related innovation and entrepreneurship among UA students and includes a $1,000 scholarship. **Alexandra Armstrong**, a doctoral candidate in veterinary sciences and microbiology, was honored for her research in developing a vaccine for campylobacteriosis, one of the most common foodborne bacterial diseases, estimated to affect more than 2.4 million persons annually according to the Centers for Disease Control and Prevention.

About Ronald S. Weinstein, MD

Ronald S. Weinstein, MD, has an international reputation for creativity and leadership. He has pioneered original research in cancer diagnostics and the human-computer interface, championed the translation of his inventions into commercial products and founded companies in the technology-based sector to market their products. Dr. Weinstein is a master at recycling "lessons learned" from one academic field into another area of innovation.

An internationally acclaimed academic physician who has been honored for his work in creating transformational health-care delivery systems, Dr. Weinstein is the founding director of the award-winning Arizona Telemedicine Program (ATP). Established in 1996 with funding initiated by then state Rep. Robert "Bob" Burns (now retired Senate president), the ATP has become a fountainhead for innovation at the UA. Dr. Weinstein likes to take on big challenges, especially in areas where others have failed. After two Arizona governors failed in the 1990s in their efforts to establish a broadband telecommunications infrastructure for rural Arizona, Dr.

Weinstein addressed the challenge by creating and operating the Arizona Rural Telemedicine Network from within the UA. This unique university-based, 50-community and 160-site broadband telecommunications network brings needed clinical services to hundreds of thousands of patients and has saved lives. The ATP has both an innovative governance structure and a unique business model and has established a strong academic program that has attracted millions of dollars for translational research to the UA.

Dr. Weinstein also is a highly respected thought leader in the pathology field. In the mid-1980s, he became one of the earliest advocates for National Institutes of Health (NIH) funding of translational research, successfully lobbying the National Cancer Institute (NCI) for special funding for the creation of the multi-institution National Cancer Institute's Flow Cytometry Network (NCIFCN), which he headquartered and directed in Chicago. The NCIFCN brought urinary flow cytometry from the research laboratory into clinical practice, benefiting thousands of urinary bladder cancer patients. For this and other noteworthy achievements, Dr. Weinstein received the prestigious Koss Medal of the International Society for Urological Pathology.

Another major challenge for diagnostic pathology laboratories was the unacceptably high rate of diagnostic discrepancies among pathologists rendering diagnoses on cancer cases being entered into critical clinical trials of new chemotherapy agents. Dr. Weinstein, a Massachusetts General Hospital-trained pathologist and international expert on urinary bladder cancer, was asked by the NCI to address this critical issue. He responded by inventing a new approach for rendering remote quality assurance cancer diagnoses.

Dr. Weinstein introduced the word "telepathology" into the English language in an influential editorial in which he described his vision for the creation of robotic light microscopy-enabled diagnostic networks that could address the challenges caused by the mal-distribution of high quality pathology diagnostic services. He created a unique Vision Physiology Laboratory in Chicago that evaluated the HDTV video microscopy diagnostic accuracy of pathologists in rendering cancer diagnoses. This successful translational research became the foundation for Dr. Weinstein's new field, telepathology. He and his sister Beth co-founded the first robotic telepathology equipment company, Corabi International Telemetrics, Inc. (Corabi is Dr. Weinstein's wife Mary's maiden name), starting out in the Chicago Tech Park in West Chicago near the Rush University campus. At the same time, his university-based translational research group authored the first scientific paper on telepathology. He became known as the "father of telepathology" for inventing, patenting and commercializing telepathology in the late 1980s.

Today, there are more than 1,000 scientific papers related to telepathology from 400 academic departments in more than 30 countries, and more than 100 issued U.S. patents related to telepathology. Tens of thousands of patients worldwide have benefited from telepathology services. Products leveraging Dr. Weinstein's telepathology patents are manufactured by Apollo PACS®, a leading vendor of telepathology systems for the U.S. Department of Veterans Affairs Medical Centers, including the Southern Arizona VA Health Center System hospital in Tucson. The Department of Pathology at the UA College of Medicine has been at the forefront of telepathology and digital pathology translational research since 1992.

In 2001, Dr. Weinstein teamed up with faculty and a graduate student at the UA College of Optical Sciences to create the first ultra-rapid whole slide image (WSI) processor, an alternative approach for rendering telepathology diagnoses. Commercialized by a UA spin-off company, DMetrix, Inc., its DX-40 processor set the WSI performance standard for the digital pathology industry. DMetrix, Inc., was runner-up in the *Wall Street Journal* International Innovation Competition in 2005, second to the General Electric Company.

Dr. Weinstein also has received recognition for his innovations in the computer software industry and for academic facility design. In 1982, he co-founded one of the first PC-based education software companies and personally designed a number of novel computer learning tools. This education software product for SAT test preparation was successfully commercialized. The company, OWLCAT, Inc., was acquired by a major California software company, Digital Research, Inc., in 1984. In 2005, Dr. Weinstein created concepts for two innovative video-social networking platforms. For these, he integrated novel hardware and software packages. These were successfully implemented in the state-of-the-art T-Health Amphitheater, which he co-designed and built on the new Phoenix Bioscience Campus. The T-Health Institute in Phoenix, which Dr. Weinstein founded as a division of the Arizona Telemedicine Program, houses the T-Health Amphitheater. For these innovations, the Arizona Telemedicine Program received the first place 21st Century Achievement Award of the International ComputerWorld Honors Program.

In addition to his work as an innovator, Dr. Weinstein has made important contributions in basic science research and has authored more than 500 professional publications. He has been president of five national professional organizations, including the American Telemedicine Association and the United States and Canadian Academy of Pathology. He has received many honors and awards, including the Distinguished Service Award of the Association of Pathology Chairs, the Eliphalet Nott Medal (Union College's Distinguished Alumnus Award), the K.F. Mostofi Distinguished Service Award of the International Society for Urologic Pathology, the inaugural R4R Award of the Association of American Medical Colleges (awarded to the ATP for transformative innovations in health-care delivery), the Arizona Medical Association's Distinguished Service Award, the Arizona BioIndustry Association's Bioscience Start-up Company-of-the-Year Award (awarded to DMetrix, Inc., which he co-founded), the Arizona Leader-of-the-Year in Public Policy Award of the *Arizona Capitol Times*, the UA College of Medicine's Lifetime Teaching Award and the Association for Pathology Informatics' Lifetime Achievement Award.

Dr. Weinstein is from a multi-generational family of innovators and inventors. His father was a successful inventor-entrepreneur. Dr. and Mrs. Weinstein's daughter, Katherine Weinstein Miller, graduated summa cum laude from the University of Pennsylvania and received her law degree from Yale Law School. She is director of policy in the District Attorney's Office in San Francisco and is credited with creating innovative truancy programs that have significantly reduced chronic truancy in the Bay Area. Their son, John B. Weinstein, PhD, graduated summa cum laude from Harvard College and received his doctorate in East Asian studies from Columbia University. He began studying Mandarin as a six-year-old and is fluent in the language. He is well known for his highly creative "Two Chinese Characters" YouTube Chinese language mini-courses. John is founding dean of the new Newark-Bard High School/Early Entry College, where

he is implementing innovative curriculum. The Newark-Bard College was partially funded by a $100 million dollar gift to Newark from Mark Zuckerberg, the founder of Facebook. John is a well-published authority on Chinese theater and a leader in Asian studies academic circles. Dr. and Mrs. Weinstein's son-in-law, Craig Miller, is vice principal and co-founder of Life Learning Academy in San Francisco. This innovative model high school for high risk students recently was named California "Charter School of the Year."

About the Arizona Telemedicine Program

The Arizona Telemedicine Program (ATP) offers a variety of services and educational programs. Since it was established in 1996, ATP has responded to some unique health challenges for Arizona, including a large population based in rural or remote areas and large numbers of Native Americans, many of whom reside far from urban health centers. An additional need addressed by ATP was improving health care for incarcerated individuals in the state prison system.

ATP developed and operates its own broadband telecommunication system staffed by 24/7 engineers and services a network of more than 100 health-service facilities. More than 60 clinical subspecialty services have been provided through the network, with more than one million consultations.

In addition to patient services, ATP provides a broad array of educational offerings, including the marketing and collaborative staffing of Arizona State University's Teach Tec program, training high school teachers to utilize cutting-edge communication strategies in their teaching; broadcasting UA College of Medicine medical/surgical grand rounds to providers throughout the state and providing formal training seminars on the basics of telemedicine. More than 200 continuing education CME and CE programs are offered annually as live presentations and webinars for health-care providers throughout the state and nationally. For some of this training, ATP has utilized the T-Health Amphitheater, a unique high-end videoconferencing facility at the UA College of Medicine – Phoenix, designed specifically for exercises in interprofessional interaction among health-care students. Participant satisfaction with continuing education has been very high.

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