News

Paul Iaizzo Discusses 3-D Printing in Washington Post
Dr. Paul A. Iaizzo, Professor of Surgery and IEM Associate Director for Education and Outreach, discusses the application of 3-D printing of hearts to surgery, medical device design and education in a recent edition of the Washington Post. The surgical applications include the printing of a model heart prior to surgery to help the patient and family members better understand the situation and provide them with the peace-of-mind that comes from understanding it. “It’s powerful and comforting for parents to really understand what the problem is,” says Dr. Iaizzo. The educational applications include the use of printed hearts for surgical residents and students in the medical school, which Dr. Iaizzo says “puts that anatomy in the brain in a three-dimensional way that never could have been done another way.”

How 3-D Imaging Could Change Heart Surgery in the Future

John Bischof Discusses Organ Preservation in Economist
John C. Bischof, Professor of Mechanical Engineering and IEM Associate Director for Development, has a proposed solution to one of the major challenges of warming cryopreserved organs: heating the tissue quickly and uniformly enough to avoid the damage that would occur from the crystallization or cracking (fracture) that would otherwise occur during the process. Dr. Bischof’s approach is to apply tiny (nano) particles of magnetite to the cryoprotectant fluid that bathes the organ, then heat them and the organ by placing the system in a fluctuating magnetic field, an approach he has successfully tested on heart valves and arteries. It is one of several approaches presented in a recent Economist article to allow for the better cooling and warming of organs to achieve the ultimate objective of making many more of them available for transplantation.

Wait Not in Vain

Louis Mansky’s Research Could Lead to More Affordable HIV Drugs
IEM Member Dr. Louis M. Mansky, Chair of the Department of Diagnostic and Biological Sciences and Director of the Institute for Molecular Virology, was the lead author of a recent study showing how an RNA-based nucleoside, 5-aza-C, blocked the ability of HIV to spread. As reported in Infection Control Today, this could lead to more affordable HIV medications because RNA-based drugs can be produced in large quantities at a lower cost than most currently available HIV drugs, which are DNA-based. Dr. Mansky says that while 5-aza-C is not as effective at treating HIV as those current drugs,“we can use what we know to try mimicking 5-aza-C to discover new compounds that could be more effective while still being more affordable to produce.” The study is being published in the American Society for Microbiology’s journal Antimicrobial Agents and Chemotherapy.

Study Identifies Mechanism for Drug Target to Help Block HIV’s Ability to Spread

Research by John Osborn Shows that Drug-Resistant High Blood Pressure can be Controlled by Renal Denervation
Dr. John Osborn, Professor of Integrative Biology & Physiology, and IEM Member, was the lead investigator of a study showing that drug-resistant hypertension can be treated by completely ablating nerves to the kidneys. As reported by Medical Xpress, the research shows that arterial blood pressure was lowered when both efferent and afferent nerves between the brain and kidneys were ablated, but not when ablating only the afferent nerves. As a result, Dr. Osborn says that, “Although catheter-based renal nerve ablation is now possible, catheter design needs to be improved since present catheters appear only to partially denervate the kidney. Clearly, it is also important to develop a method to assess the
completeness of denervation at the time of the procedure.” The research was published in the American Journal of Physiology-Regulatory, Integrative, and Comparative Physiology.

**Rat Renal Denervation Drug-Resistant Hypertension**

**David Jacobs Conducts Research Showing that Environmental Contaminants in Low Doses Can Harm the Brain**

IEM Member Dr. David R. Jacobs, Professor of Epidemiology & Community Health, was among a group of investigators who conducted research showing that persons who are repeatedly exposed to organochlorine pesticides (OCPs), such as DDT, are at greater risk for cognitive impairment. As reported by EurekAlert!, the research included approximately 1,000 individuals at 70 years of age in Uppsala, Sweden. Those with high levels of OCPs in their serum were found to have had three times the risk of future cognitive impairment compared to others who had low levels of the containments. While OCPs were already known to be neurotoxins, the findings are surprising because it shows that even a low level of exposure to OCPs can be harmful if it occurs during a long period of time. The research was published in Environmental International.

**Low-Dose Exposure of Environmental Contaminents Can Be Harmful to Brain**

**Walter Low and Ann Parr Discuss Relevance of Fetal Tissue to their Research in Treating Parkinson’s and Spinal Cord Injury**

IEM Members Drs. Walter Low and Ann Parr discuss the importance of fetal tissue to their research in a recent Star Tribune article highlighting the work of several University of Minnesota researchers who are using these types of cells. Walter C. Low, Professor of Neurosurgery, uses them as a positive control against which to assess the effective phenotype of differentiated stem cells from sources other than fetal tissue. “Our goal is to one day take a piece of your skin and make that into a pluripotent stem cell ... that makes dopamine neurons for treating Parkinson’s patients,” says Dr. Low. A more direct use of fetal tissue stem cells is being explored by Dr. Ann M. Parr, Assistant Professor of Neurosurgery and Director of Spinal Neurosurgery, who is determining whether they can be used to repair damage to the spinal cord. “There are lots and lots of people out there who have chronic spinal cord injury and there is nothing to offer them” says Dr. Parr, who adds “it’s the first time this has been a possibility.”

**From HIV to Parkinson’s U. Researchers Say Fetal Tissue is Invaluable**