FelCom’s Career Development Seminar, “Careers in Forensic Science” offered an opportunity for NIH fellows to learn more about this career choice from five outstanding speakers. They discussed their individual career paths and what it takes to transition to a career in Forensic Science.

The first speaker, Mr. Dave Pauly, is the Director of Applied Forensic Science and an Assistant Professor of Justice Studies at Methodist University in Fayetteville, North Carolina. He gave some background information on his career path, which began in law enforcement and felony investigations with the United States Army. He considers his path into academia as non-traditional. He has what he referred to as the “MUTT Factor”, which is a general knowledge of many things, not just one specific discipline. His responsibilities range from crime scenes to interviews and courtroom testimony. He is a graduate of the FBI National Academy and also holds a Master of Forensic Science degree from The George Washington University. As a Special Agent-in-Charge, Forensic Science Officer and Commander in the U.S. Army Criminal Investigation Command, his duties took him to multiple locations within the United States and foreign countries. As an Assistant Professor and consultant, Mr. Pauly emphasized the necessity of maintaining membership in professional organizations in order to keep current in the field and as a good networking resource. He is a member of multiple professional organizations such as the American Academy of Forensic Science and The Vidocq Society, a members-only crime-solving club, made up of forensic professionals who apply their collective forensic skills and experience to "cold case" homicides and unsolved deaths.

Dr. Charles Tumosa was the second speaker of the day. He is at present the co-Program Director of the Forensic Studies Program at the University of Baltimore. Dr. Tumosa received his B.S. in Chemistry from St. Joseph's College in Philadelphia and his Ph.D. in Chemistry from Virginia Tech, Blacksburg, VA. He started his forensics career with the Philadelphia Police Department, where he ran the Criminalistics Laboratory for almost 18 years. The primary emphasis of the lab was the identification and characterization of trace materials (such as blood, hair, glass, inks, paints, polymeric materials, explosive residues, arson residues, etc.) in order to reconstruct events surrounding a specific criminal incident. In addition to his technical support role, he served as an information resource to various city agencies and provided expert testimony in hundreds of criminal and civil cases across various federal and local jurisdictions. Following his retirement from the Philadelphia Police Department, he joined the Smithsonian Institution in Washington D.C. as the Head of Analytical Services, Conservation Analytical Laboratory (CAL)
(currently called the Smithsonian Center for Materials Research and Education, SCMRE). The laboratory performed analyses for the Smithsonian Institution, other museums and federal agencies. Typical analyses included the identification of corrosion products, testing of suitability of exhibit and storage materials for museum use, and the examination of archaeological materials.

The third speaker, Dr. Kirk Yeager, is a senior explosives scientist with the FBI. He received his B.S. in Chemistry from Lafayette College and Ph.D. in Inorganic Chemistry from Cornell University. He started out as a research scientist at the Energetic Materials Research and Testing Center (EMRTC) and an Adjunct Professor in the New Mexico Tech Department of Chemistry. Upon joining the FBI, he served as a Physical Scientist/Forensic Examiner for the FBI Laboratory’s Explosives Unit, where he was deployed as a bombing crime scene investigator to dozens of countries. Currently, Dr. Yeager has approximately 20 years of experience with improvised explosives and IEDs and in his spare time, pursues Dan Zan Ryu Ju-Jutsu, where he holds the rank of black belt.

Dr. Max M. Houck is the Director of the newly opened Consolidated Forensic Laboratories in Washington, D.C. Dr. Houck described the lab as a model and an experiment in forensic laboratory design and planning. It combines forensic labs of the D.C. Metropolitan Police Department with the Public Health Laboratory and the Office of the Chief Medical Examiner. He is internationally recognized as a forensic expert; in the course of his career, has worked in the private sector, the FBI Laboratory, and academia. Some of his casework includes high profile investigations such as the September 11 attacks on the Pentagon, the U.S. Embassy bombings in Africa, the Branch Davidian Investigation, the D.B. Cooper case, and the West Memphis Three case. He also served as the Chair of the Forensic Science Educational Program Accreditation Commission (FEPAC), an organization with the primary function of developing and maintaining standards in the forensic science field; the commission also administers an accreditation program that recognizes and distinguishes high quality undergraduate and graduate forensic science programs around the country.

Our final speaker, Dr. Daniel Podini is currently an Assistant Professor in Forensic Molecular Biology and Biological Sciences at the George Washington University. He focuses on forensic science research and serves as an advisor. Dr. Podini received both his undergraduate and graduate education in Italy at the Universities of Parma and Rome, respectively. He then served as a Lieutenant and DNA analyst in the Biology Section of the Carabinieri’s Center for Scientific Investigations, where he performed forensic crime scene analysis and expert testimony in court cases. He later created and directed the forensic section of the Genoma laboratory in Rome, where he served as the director of the Forensic Section. While at Genoma, in collaboration with the International Organization for Migration (IOM - Rome division), he coordinated the “family
reunification” project. The project was responsible for family reunification of Somalians living in Italy. They performed DNA analysis and subsequent statistical analysis to verify family relationships between Somalians living in Italy and their relatives abroad. His casework also included paternity testing, forensic biological investigations from specimens found at crime scenes, and testifying as an expert witness in court for the District Attorney Offices of Rome, Florence and Civitavecchia.

The speakers’ diverse backgrounds highlight various aspects of and different paths to a career in forensic science, yet they all emphasized a set of central themes:

- Forensic science is not like the TV show CSI. Practitioners can potentially be exposed to dangerous and extremely volatile situations.
- Background checks are usually a general requirement for employment in the forensic science field.
- Forensic science is in an extreme growth phase with new and expanding sub-disciplines such as Forensic Nursing and Medicine. Each discipline has its own set of technologies and practices.
- The "forensic science community" includes scientists with degrees in chemistry, biochemistry, biology, and medicine, psychology, statistics, computer analysts, and other practitioners without such degrees, such as laboratory technicians, polygraph technicians, artists for composite drawings, crime scene investigators, and law enforcement officers.
- Forensic science encompasses a broad range of disciplines such as toxicology, drug analysis, fingerprint analysis, writing sample analysis, gun residue analysis, tool marks, bite marks, and specimens such as hair, semen, skin etc.
- In most cases, the science and technology propelling the field has surpassed the capabilities of the managers and practitioners in the field. There is a need for more forensic science practitioners (not just DNA analysts) in academia, research, forensic labs (federal, state, local, and private) and a stronger bridge between researchers and practitioners.
- It is critical to understand the details of forensic science and develop the communications skills necessary to explain science to a non-scientific audience in terms they would understand.
- Other skills necessary to being a good forensic science practitioner include:
  - Dependability and integrity. These are extremely important to the field, as the field requires reliable, honest, ethical people.
  - High tolerance for stress, gory and hazardous condition.
  - Above average laboratory practice and technical skills.
  - Active listening and great attention to detail. The job requires careful and thorough completion of tasks.
  - Complex problem solving skills.
Accountability and excellent record keeping.
Logical reasoning and ability to deduce and come to common sense conclusions from analysis.
Experience working with low/unpredictable amounts of sample.
The ability to multitask, plan and organize efficiently.
The ability to work as part of a team and manage personnel.

- The speakers also put emphasis on making efforts to fill any skill gaps by doing extra activities, such as joining a club, taking on a part-time job, an internship or doing volunteer work.
  - Call local crime and forensics labs for internship opportunities.
- The presenters also spoke about the vital role of legislatures in providing the financial support to update systems, train the practitioners, support the laboratory and fund researchers.
- There is extensive variability across disciplines with regard to techniques, methodologies, reliability, types and numbers of potential errors, research, general acceptability, and published material.
  - A congressionally mandated report from the National Research Council finds serious deficiencies in the nation's forensic science system and calls for major reforms and new research.
  - The same report finds rigorous and mandatory certification programs for forensic scientists currently lacking, as are strong standards and protocols for analyzing and reporting on evidence.
- The American Academy of Forensic Sciences (www.aafs.org) is a good resource and source of information for anyone interested in forensic science. They are associated with FEPAC (http://www.aafs.org/fepac), the commission that develops national standards for education in forensic sciences and accredits forensic science education programs. AAFS provides leadership to advance forensic science and its application to the legal system. Their objectives include the promotion of professionalism, integrity, competency, education, research and collaboration in the forensic sciences.