VSoE New Faculty Orientation

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DC Office of Research Advancement
Office of the Vice President of Research

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DC Office Goals

• Provide USC presence near funding agencies
• Identify large-scale funding opportunities
• Form collaborations within and outside USC to develop competitive applications
• Support proposal preparation
• Navigate federal bureaucracy
Where We Are

701 Pennsylvania Avenue, NW, Suite 540
• PhD, clinical psychology (Yeshiva University); genetics research (Columbia U); postdoc, genetics (Washington U St. Louis)
• Faculty, Washington U School of Medicine
• Eleven years, senior NIH program official
  • 17 RFAs, PAs; 37 workshops
  • Mental disorders (autism, schizophrenia), genetics, genomics, neuroscience
DC Research Advancement Office
James Murday - Background

• Ph.D, solid state physics (Cornell U)
• Forty years in chemistry, physics, and materials science at DOD’s NRL and ONR
• Architect, US National Nanotechnology Initiative
DC Research Advancement Office
Allan Olson - Background

• Maintained senior leadership positions in private industry and the U.S. government involving research, strategic planning, program management, systems engineering
• Previous Director of Horizontal Technology Integration
• Holds degrees and certifications in program management, electrical engineering, contracting
Research Advancement Services

- Strategic planning
- Proposal preparation - scientific
  - Help develop ‘vision’
  - Help build collaborations (within & outside USC)
  - Writing, reviewing, editing
- Proposal preparation – logistic/administrative
  - Conference/video calls, meetings
  - Budgets, budget justifications, PARs
  - Biosketches, letters of support
  - References, figures
- Federal agency connections / advocacy / intel
- Faculty development
How we can help you

Writing and Copy-Editing

• Review drafts for organization and responsiveness to solicitation
• Copy-edit drafts for grammar, clarity, and completeness
• Write de novo text for non-technical aspects of the proposal, e.g., outreach, administrative organization, USC assets
• Creation of graphics, organizational charts, and timelines
• Review summary statements and previous reviewer reports to provide guidance on resubmissions
• Generate drafts of support letters from consultants, advisory committee members, and other partners
• Generate drafts of supplementary documents required for submission
How we can help you

Budget Preparation
- Assist PIs and school/departmental staff to develop/revise budgets
- Prepare budget justifications
- Identify potential strategies for cost sharing

Administrative & Logistical Activities
- Coordinate collection of required documents from participating collaborators (including subcontractors), such as biosketches and letters of support
- Complete application forms for electronic or paper submission
- Ensure PIs obtain required governmental IDs and corresponding accounts (e.g. eRA Commons, NIH ASSIST)
- Ensure adherence to internal procedures and requirements prior to submission (e.g. disclose, Conflict of Interest)
How we can help you

Proposal Submission

• Facilitate department approvals as required by USC Department of Contracts and Grants
• Coordinate the final on-time submission with USC Department of Contracts and Grants and other relevant USC offices
How we can help you

Team Building
• Provide strategic input related to team composition and expertise
• Identify USC faculty as potential collaborators
• Identify faculty from other universities/organizations as potential partners

Proposal Organization and Planning
• Organize conference calls and face-to-face meetings
• Develop outlines of application components
• Create timelines for preparing and submitting applications
• Conduct analyses of existing projects funded under the targeted program to determine optimal team composition and leadership
% of Assisted Faculty Who Have Utilized Research Advancement Services

- Identify Funding
- Interface with agencies
- Assemble proposal team
- Utilize USC MAPs
- Write proposal
- Review/edit
- Create Figures
- Add references
- Generate admin docs
- Generate budget
- Review budget
- Budget justification
- Set up conference calls
- Coordinate across schools
- Submit application

- Planning/Strategy
- Proposal
- Budget
- Logistics
DC Office of Research Advancement
Applications Submitted and Awarded

Success Rate = 31.9%

Submitted
Awarded

913
291
DC Office of Research Advancement
Cumulative Dollars Awarded

$705,747,514
Research Strengths

- Neuroimaging & Big Data Bioinformatics
- Aging & Alzheimer’s Disease
- Biomedical Devices
- Environmental Health
- Health Policy
- National Security
- Information Science
- Quantum Computing
- Brain Computer Interfaces
- Children’s Health
- Convergent Biosciences
Neuroimaging & Big Data Bioinformatics

- NIH BD2K Centers of Excellence
- Viterbi/ISI data management centers - funding from several NIH institutes
- NIDCR Craniofacial Research Hub
- NIH Transformative Research Program: Dynamic Mapping of Neural Synapses
- Mark and Mary Stevens Neuroimaging and Informatics Institute ($50M endowment)
- State of the art equipment - 7 Tesla MRI scanner
- Brain & Creativity Institute
- Dana and David Dornsife Cognitive Neuroimaging Center
Aging & Alzheimer’s Disease

- Zilkha Neurogenetic Institute - world leader for basic neuroscience research
- NIA Alzheimer Disease Research Center (ADRC) - focuses on multi-ethnic communities in greater LA area
- Alzheimer's Therapeutic Research Institute (ATRI) - industry & NIH funding
- Laboratory of Neuro Imaging (LONI) - industry & NIH funding
- NIH funding of multiple training resources in demography & minority aging
- Research programs in digital, global, and personalized aging
- Major focus of USC health policy and neuroimaging research programs
Biomedical Devices

- NSF Engineering Research Center - Biomimetic MicroElectronic Systems
- Resource Center for Medical Ultrasonic Transducer Technology
- Center for Neural Engineering
- Biomedical Simulations Resource
- USC team led by Mark Humayun developed *Argus II*, a retinal prosthesis approved by FDA as first bionic eye in US
- Humayun to receive National Medal of Technology and Innovation from President Obama
Environmental Health

• NIEHS Southern California Environmental Health Sciences Center (SCEHSC) works to reduce the burden of adverse effects from the environment

• EPA/NIEHS Southern California Children’s Environmental Health Center (SCCEHC) conducts studies on near-roadway air pollution’s role in the development of obesity & metabolic abnormalities that increases risk of type 2 diabetes

• NIEHS/EPA Children’s Health Study (CHS), one of the largest & most detailed studies of long-term effects of air pollution on children’s respiratory health

• NIEHS/NIMHD Maternal And Developmental Risks from Environmental & Social Stressors Center (MADRES) studies low-income, urban minority communities in Los Angeles that have both high obesity rates & wide-ranging exposure to environmental pollutants
Health Policy

- Schaeffer Center for Health Policy and Economics: joint Pharmacy/Price
- Center for Economic and Social Research
- Two NIH Roybal Centers: Health Policy Simulation & Health Decision Making & Financial Independence in Old Age
- NIA Research Center for Minority Aging Research
- NIA training program in the demography of aging
- Partnership between Schaeffer Center and Brookings
- US News & World Report “health policy and management”: Price School ranked third nationally
National Security

- DHS National Center for Risk and Economic Analysis of Terrorism Events (CREATE) (bridge funding to new competition)
- Cyber DEfense Technology Experimental Research Laboratory (DETER) shared testbed providing a platform for innovative cybersecurity technology
- DARPA Center for Rapid Automated Fabrication Technologies (CRAFT): faster & more secure chip design & fabrication
- DARPA Low Resource Languages for Emergent Incidents (LORELEI): exploiting language information for situational awareness
- IARPA Domain-Specific Insight Grafts (DIG): index fine grained data collection, organization & analysis of social and other media
- IARPA Graphics-Based Learning Approach Integrated with Vision Enhancements (GLAIVE): applying machine learning techniques to pattern recognition & computer vision
Information Science

- Viterbi Information Science Institute (ISI) - cutting edge medical informatics, intelligent systems, computational systems, advanced electronics, configurable robotics, grid technologies, Big Data management & integration

- Institute for Creative Technologies (ICT) - ‘virtual’ humans, graphics, cognitive architectures, AI, emotion modeling

- Army Research Lab (ARL) West partnership

- Integrated Media Systems Center (IMSC)

- Leadership in virtual reality
Quantum Computing

- Center for Quantum Information Science and Technology (QCIST) led by Daniel Lidar
  - IARPA-funded program - USC Quantum Computation and Open Quantum Systems

- USC-Lockheed Martin Quantum Computing Center (QCC) at the Informational Sciences Institute: closing the gap between quantum computation and real life critical problems
  - D-Wave 2X™ one of two commercial adiabatic quantum optimizer worldwide
Brain-Computer Interface

- Neural Systems Engineering & Information Processing (NSEIP) Lab led by Maryam Shanechi:
  - Using algorithms modeling and in vivo experimentation to design closed-loop brain-computer interface (BCI) machines
  - US/UK multidisciplinary MURI to explore BCIs for enhanced decision making
Children’s Health

- LA DREAMERs (Life-course Approach to Developmental Repercussions of Environmental Agents on Metabolic Respiratory health),
  - NIH Environmental Influences on Child Health Outcomes (ECHO)-funded initiative led by Frank Gilliland
  - Incorporates satellite and ground-based pollutant measurement to compare with biomarkers and health outcomes
Convergent Biosciences

- Michaelson Center for Convergent Bioscience (MCCB): 186 researchers from 17 labs and several other interdisciplinary initiatives, including:
  - MCCB Bridge Institute (Ray Stevens)
  - CSI-Cancer (Peter Kuhn)
  - Cellular Imaging (Scott Fraser)
  - Discovery Informatics (Carl Kesselman)
  - Drug Discovery (Charles McKenna, Steve Kay)
  - Center of Data, Algorithms and Systems for Health, DASH (Fei Sha)
Unique USC Resources

- **Information Sciences Institute (ISI)**
  - $60 million annually from >20 federal agencies / corporations
  - [http://www3.isi.edu/home](http://www3.isi.edu/home)
- **Institute for Creative Technologies (ICT)**
  - US Army University Affiliated Research Center (UARC)
  - [http://ict.usc.edu/](http://ict.usc.edu/)
- **Clinical Resources**
  - [http://sc-ctsi.org/](http://sc-ctsi.org/)
- **Schaeffer Center for Health Policy and Economics**
  - Recruited Nobel Laureate in Economics (Daniel McFadden)
  - $25 million in NIH grant support
- **School of Cinematic Arts**
  - #1 ranked cinema/film school *(US News and World Report)*
  - #1 game design program *(Princeton Review)*
  - [http://cinema.usc.edu/](http://cinema.usc.edu/)
- **Outreach Partners**
Information Sciences Institute (ISI)

- Cutting edge computer and information science:
  - Medical Informatics
  - Intelligent Systems
  - Computational Systems
  - Advanced Electronics
  - Configurable Robotics
  - Grid Technologies

- Very large scale data management & integration
- $60 million annually from >20 federal agencies / corporations
- DOD, DHS, DOE, NSF & NIH funding (NIGMS, NHGRI, NIMH, NHLBI)
- 350 engineers, research scientists, graduate students, and staff
- EHRs, electronic healthcare systems
- Developed Domain Name System (DNS) and “.com” address system
- MOSIS - low-cost prototyping & production volume service for VLSI circuit development
Institute for Creative Technology

- US Army University Affiliated Research Center (UARC)
- Biomedical research projects include:
  - Virtual Reality Augmentation (social skills training for autism)
  - Virtual Iraq/Afghanistan (PTSD assessment and treatment)
  - Virtual Humans (STEM education)
  - MedVR Lab (clinical training)
  - NeuroSim Lab (cognitive assessment)
- Paul Debevec (2009 Scientific and Engineering Academy Award)
USC Clinical Resources: Highlights

- Rehabilitation Medicine
  - #1 Physical Therapy department (*US News and World Report*)
  - #3 Occupational Therapy department (*US News and World Report*)
- Emergency Medicine Department
  - 150,000 annual visits
  - 28% of all trauma care in LA county
- Department of Urology
  - Urology Robotics Center of Excellence (Dr. Inderbir Gil)
- Department of Ophthalmology (retinal prosthesis; #11, *US News and World Report*)
- School of Pharmacy (#9, *US News and World Report*)
- NIH-funded CTSA (Dr. Thomas Buchanan)
- Public health focus (cancer epidemiology, preventive medicine, tobacco control)
Unique Clinical Partners

- LAC+USC Healthcare Network
  - 600 beds
- Keck Medical Center of USC
  - Keck Hospital of USC
  - USC Norris Cancer Hospital/ NIH Comprehensive Cancer Center
- Children’s Hospital Los Angeles (CHLA)
  - 347 beds
Schaeffer Center for Health Policy and Economics

- Established by donor gift in 2009
- Collaboration between USC School of Public Policy and USC School of Pharmacy
- Led by Stanford trained economist Dana Goldman
- Recruited Nobel Laureate in Economics (Daniel McFadden)
- Strong partnerships with Harvard, Stanford, Dartmouth, Boston University, Brookings Institution and RAND Corporation
- >$25 million in NIH grant support
  - Behavioral Economics, Science of Medicare Reform, Health Policy & Simulation
School of Cinematic Arts

- #1 ranked cinema/film school in US
- Six Divisions
  - Critical Studies, Animation & Digital Arts, Interactive Media, Film & TV Production, Producing, Writing
  - #1 ranked game design program
- Interest in health
  - Health behavior game (RWJF)
  - Obesity prevention game (NIH)
  - Immunology education game (NSF)
  - Autism education project (AHRQ)
- Faculty awards include Oscars, Emmys, Golden Globes, Pulitzer, etc
- **Private donors** - e.g., George Lucas, Steven Spielberg, Jeffrey Katzenberg, Brian Grazer
- **Corporate donors** - e.g., Walt Disney, Microsoft, Electronic Arts, Warner Bros
- **Public & private funding** - AHRQ, NIH, USDA, Dept of State, Gates Foundation
Unique Outreach Partners

- **California Science Center (CSC)**
  - 1.4 million annual visits (370,000 children)
  - Two-thirds are Hispanic & African-American
  - Admissions-free venue allows for informal science education testbed

- **Natural History Museum of Los Angeles County**
  - > 35 million specimens, dating back 4.5 billion years
  - A basis for biodiversity studies

- **Los Angeles Unified School District (LAUSD)**
  - 2nd largest public school system in the U.S.

- **SETI Institute**
  - Funded by NASA, NSF, DoE, and numerous private donors
  - Potential for astrobiology & other science partnerships
  - Citizen Science outreach program
Center for Excellence in Research

- **CER Research Advancement Workshops**
  - Example workshops include:
    - THIS EVENT!
    - Developing NIH Applications (Dr. Steven Moldin)
    - Preparing and Submitting NSF Proposals (Dr. Phil Taylor)
    - Developing and Submitting a DoD and DoE Research Grant (Dr. James Murday)
  - [http://research.usc.edu/about/vp/cer/](http://research.usc.edu/about/vp/cer/)

- **Proposal Review Service**
  - Peer-to-peer proposal review for applications to external funding agencies
  - Notify Office of Research 4 weeks before proposal due date

*Contact info: Silvia da Costa in the Office of Research ([sdacosta@usc.edu](mailto:sdacosta@usc.edu) or 213-740-6709)*
US Federal Revenues & Expenditures 2000-2020

Source: CBO (data after 2009 are projections)
Trends in Research by Agency, FY 1976-2018

Billions of constant FY 2018 Dollars

NOTE: FY 2018 figures are AAAS estimates from omnibus legislation.
Source: 1975-1994 figures are from the NSF federal funds survey; remainder is from AAAS R&D reports. © 2018 AAAS
obligations in billions of constant FY 2016 dollars

"Other" includes research not classified (includes basic research and applied research; excludes development and R&D facilities). Life sciences are split into NIH support for biomedical research and all other agencies' support for life sciences.

Source: National Science Foundation. Federal Funds for Research and Development series. FY 2015 and 2016 data are preliminary. Constant-dollar conversions based on OMB's GDP deflators. © 2016 AAAS
Federal Funding

- **Research Support**
  - DOD Young Investigator Program (DOD YIP)
  - NSF Faculty Early Career Development Program (NSF CAREER)
  - DOE Early Career Research Program
  - NIH individual fellowship and career development awards (pre- and postdoctoral; clinical and basic; mentored and non-mentored)
  - NIH Transformative Research Awards (R01)
  - NIH Pioneer Award Program (DP1)
  - NIH Director’s New Innovator Award Program (DP2)
  - NIH & NSF institutional training grants (T32, NRT)

- **Lab Infrastructure Support**
  - NIH Shared Instrumentation Grant Program (S10)
  - NSF Major Research Instrumentation Program (MRI)
  - DOD Defense University Research Instrumentation Program (DURIP)
DC Office for Research Advancement

Additional questions, advice:

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