



NATIONAL INSTITUTE OF BIOMEDICAL IMAGING AND BIOENGINEERING

**Grant Number:** 5R01EB015611-07  
**FAIN:** R01EB015611

**Principal Investigator(s):**  
PETER V KOCHUNOV, PHD

**Project Title:** Solar-Eclipse Computational Tools for Imaging Genetics

Paffrath, Dennis Joseph  
AVP, Sponsored Programs Administration  
University of Maryland, Baltimore  
620 West Lexington Street, 4129  
Baltimore, MD 212011508

**Award e-mailed to:** nga@ordmail.umaryland.edu

**Period Of Performance:**

**Budget Period:** 08/01/2019 – 07/31/2020

**Project Period:** 08/01/2012 – 07/31/2020

Dear Business Official:

The National Institutes of Health hereby awards a grant in the amount of \$400,001 (see "Award Calculation" in Section I and "Terms and Conditions" in Section III) to UNIVERSITY OF MARYLAND BALTIMORE in support of the above referenced project. This award is pursuant to the authority of 42 USC 241 42 CFR 52 and is subject to the requirements of this statute and regulation and of other referenced, incorporated or attached terms and conditions.

Acceptance of this award including the "Terms and Conditions" is acknowledged by the grantee when funds are drawn down or otherwise obtained from the grant payment system.

Each publication, press release, or other document about research supported by an NIH award must include an acknowledgment of NIH award support and a disclaimer such as "Research reported in this publication was supported by the National Institute Of Biomedical Imaging And Bioengineering of the National Institutes of Health under Award Number R01EB015611. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health." Prior to issuing a press release concerning the outcome of this research, please notify the NIH awarding IC in advance to allow for coordination.

Award recipients must promote objectivity in research by establishing standards that provide a reasonable expectation that the design, conduct and reporting of research funded under NIH awards will be free from bias resulting from an Investigator's Financial Conflict of Interest (FCOI), in accordance with the 2011 revised regulation at 42 CFR Part 50 Subpart F. The Institution shall submit all FCOI reports to the NIH through the eRA Commons FCOI Module. The regulation does not apply to Phase I Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) awards. Consult the NIH website <http://grants.nih.gov/grants/policy/coi/> for a link to the regulation and additional important information.

If you have any questions about this award, please contact the individual(s) referenced in Section IV.

Sincerely yours,

Florence Turska  
Grants Management Officer  
NATIONAL INSTITUTE OF BIOMEDICAL IMAGING AND BIOENGINEERING

Additional information follows

**SECTION I – AWARD DATA – 5R01EB015611-07****Award Calculation (U.S. Dollars)**

|  |           |
|--|-----------|
| Salaries and Wages                     | \$116,623 |
| Fringe Benefits                        | \$33,407  |
| Personnel Costs (Subtotal)             | \$150,030 |
| Consultant Services                    | \$7,000   |
| Materials & Supplies                   | \$3,500   |
| Travel                                 | \$3,500   |
| Other                                  | \$5,336   |
| Subawards/Consortium/Contractual Costs | \$138,330 |

|   |                  |
|---|------------------|
| Federal Direct Costs                                    | \$307,696        |
| Federal F&A Costs                                       | \$92,305         |
| Approved Budget   | \$400,001        |
| Total Amount of Federal Funds Obligated (Federal Share) | \$400,001        |
| <b>TOTAL FEDERAL AWARD AMOUNT</b>                       | <b>\$400,001</b> |

|  |                  |
|--|------------------|
| <b>AMOUNT OF THIS ACTION (FEDERAL SHARE)</b> | <b>\$400,001</b> |
|--|------------------|

| SUMMARY TOTALS FOR ALL YEARS |            |                   |
|------------------------------|------------|-------------------|
| YR                           | THIS AWARD | CUMULATIVE TOTALS |
| 7                            | \$400,001  | \$400,001         |

**Fiscal Information:**

**CFDA Name:** Discovery and Applied Research for Technological Innovations to Improve Human Health  
**CFDA Number:** 93.286  
**EIN:** 1526002036A1  
**Document Number:** REB015611B  
**PMS Account Type:** P (Subaccount)  
**Fiscal Year:** 2019

|    |         |           |
|----|---------|-----------|
| IC | CAN     | 2019      |
| EB | 8015183 | \$400,001 |

**NIH Administrative Data:**

**PCC:** HBIQ / **OC:** 414E / **Released:** 08/02/2019  
**Award Processed:** 08/05/2019 12:10:35 AM

eRA  
Commons  
User Name

**SECTION II – PAYMENT/HOTLINE INFORMATION – 5R01EB015611-07**

For payment and HHS Office of Inspector General Hotline information, see the NIH Home Page at <http://grants.nih.gov/grants/policy/awardconditions.htm>

**SECTION III – TERMS AND CONDITIONS – 5R01EB015611-07**

This award is based on the application submitted to, and as approved by, NIH on the above-titled project and is subject to the terms and conditions incorporated either directly or by reference in the following:

- The grant program legislation and program regulation cited in this Notice of Award.
- Conditions on activities and expenditure of funds in other statutory requirements, such as those included in appropriations acts.
- 45 CFR Part 75.
- National Policy Requirements and all other requirements described in the NIH Grants Policy Statement, including addenda in effect as of the beginning date of the budget period.
- Federal Award Performance Goals: As required by the periodic report in the RPPR or in



- the final progress report when applicable.
- f. This award notice, INCLUDING THE TERMS AND CONDITIONS CITED BELOW.

(See NIH Home Page at <http://grants.nih.gov/grants/policy/awardconditions.htm> for certain references cited above.)

**Research and Development (R&D):** All awards issued by the National Institutes of Health (NIH) meet the definition of "Research and Development" at 45 CFR Part § 75.2. As such, auditees should identify NIH awards as part of the R&D cluster on the Schedule of Expenditures of Federal Awards (SEFA). The auditor should test NIH awards for compliance as instructed in Part V, Clusters of Programs. NIH recognizes that some awards may have another classification for purposes of indirect costs. The auditor is not required to report the disconnect (i.e., the award is classified as R&D for Federal Audit Requirement purposes but non-research for indirect cost rate purposes), unless the auditee is charging indirect costs at a rate other than the rate(s) specified in the award document(s).

An unobligated balance may be carried over into the next budget period without Grants Management Officer prior approval.

This grant is subject to Streamlined Noncompeting Award Procedures (SNAP).

This award is subject to the requirements of 2 CFR Part 25 for institutions to receive a Dun & Bradstreet Universal Numbering System (DUNS) number and maintain an active registration in the System for Award Management (SAM). Should a consortium/subaward be issued under this award, a DUNS requirement must be included. See <http://grants.nih.gov/grants/policy/awardconditions.htm> for the full NIH award term implementing this requirement and other additional information.

This award has been assigned the Federal Award Identification Number (FAIN) R01EB015611. Recipients must document the assigned FAIN on each consortium/subaward issued under this award.

Based on the project period start date of this project, this award is likely subject to the Transparency Act subaward and executive compensation reporting requirement of 2 CFR Part 170. There are conditions that may exclude this award; see <http://grants.nih.gov/grants/policy/awardconditions.htm> for additional award applicability information.

In accordance with P.L. 110-161, compliance with the NIH Public Access Policy is now mandatory. For more information, see NOT-OD-08-033 and the Public Access website: <http://publicaccess.nih.gov/>.

This award represents the final year of the competitive segment for this grant. See the NIH Grants Policy Statement Section 8.6 Closeout for complete closeout requirements at: <http://grants.nih.gov/grants/policy/policy.htm#gps>.

A final expenditure Federal Financial Report (FFR) (SF 425) must be submitted through the eRA Commons (Commons) within 120 days of the period of performance end date; see the NIH Grants Policy Statement Section 8.6.1 Financial Reports, <http://grants.nih.gov/grants/policy/policy.htm#gps>, for additional information on this submission requirement. The final FFR must indicate the exact balance of unobligated funds and may not reflect any unliquidated obligations. There must be no discrepancies between the final FFR expenditure data and the Payment Management System's (PMS) quarterly cash transaction data. A final quarterly federal cash transaction report is not required for awards in PMS B subaccounts (i.e., awards to foreign entities and to Federal agencies). NIH will close the awards using the last recorded cash drawdown level in PMS for awards that do not require a final FFR on expenditures or quarterly federal cash transaction reporting. It is important to note that for financial closeout, if a grantee fails to submit a required final expenditure FFR, NIH will close the grant using the last recorded cash drawdown level. If the grantee submits a final expenditure FFR but does not reconcile any discrepancies between expenditures reported on the final expenditure FFR and the

last cash report to PMS, NIH will close the award at the lower amount. This could be considered a debt or result in disallowed costs.

A Final Invention Statement and Certification form (HHS 568), (not applicable to training, construction, conference or cancer education grants) must be submitted within 120 days of the expiration date. The HHS 568 form may be downloaded at: <http://grants.nih.gov/grants/forms.htm>. This paragraph does not apply to Training grants, Fellowships, and certain other programs—i.e., activity codes C06, D42, D43, D71, DP7, G07, G08, G11, K12, K16, K30, P09, P40, P41, P51, R13, R25, R28, R30, R90, RL5, RL9, S10, S14, S15, U13, U14, U41, U42, U45, UC6, UC7, UR2, X01, X02.

Unless an application for competitive renewal is submitted, a Final Research Performance Progress Report (Final RPPR) must also be submitted within 120 days of the period of performance end date. If a competitive renewal application is submitted prior to that date, then an Interim RPPR must be submitted by that date as well. Instructions for preparing an Interim or Final RPPR are at: [https://grants.nih.gov/grants/rppr/rppr\\_instruction\\_guide.pdf](https://grants.nih.gov/grants/rppr/rppr_instruction_guide.pdf). Any other specific requirements set forth in the terms and conditions of the award must also be addressed in the Interim or Final RPPR. *Note that data reported within Section I of the Interim and Final RPPR forms will be made public and should be written for a lay person audience.*

NIH strongly encourages electronic submission of the final invention statement through the Closeout feature in the Commons, but will accept an email or hard copy submission as indicated below.

Email: The final invention statement may be e-mailed as PDF attachments to:  
[NIHCloseoutCenter@mail.nih.gov](mailto:NIHCloseoutCenter@mail.nih.gov).

Hard copy: Paper submissions of the final invention statement may be faxed to the NIH Division of Central Grants Processing, Grants Closeout Center, at 301-480-2304, or mailed to:

National Institutes of Health  
Office of Extramural Research  
Division of Central Grants Processing  
Grants Closeout Center  
6705 Rockledge Drive  
Suite 5016, MSC 7986  
Bethesda, MD 20892-7986 (for regular or U.S. Postal Service Express mail)  
Bethesda, MD 20817 (for other courier/express deliveries only)

NOTE: If this is the final year of a competitive segment due to the transfer of the grant to another institution, then a Final RPPR is not required. However, a final expenditure FFR is required and should be submitted electronically as noted above. If not already submitted, the Final Invention Statement is required and should be sent directly to the assigned Grants Management Specialist.

In accordance with the regulatory requirements provided at 45 CFR 75.113 and Appendix XII to 45 CFR Part 75, recipients that have currently active Federal grants, cooperative agreements, and procurement contracts with cumulative total value greater than \$10,000,000 must report and maintain information in the System for Award Management (SAM) about civil, criminal, and administrative proceedings in connection with the award or performance of a Federal award that reached final disposition within the most recent five-year period. The recipient must also make semiannual disclosures regarding such proceedings. Proceedings information will be made publicly available in the designated integrity and performance system (currently the Federal Awardee Performance and Integrity Information System (FAPIIS)). Full reporting requirements and procedures are found in Appendix XII to 45 CFR Part 75. This term does not apply to NIH fellowships.

**Treatment of Program Income:**  
Additional Costs

---

#### SECTION IV – EB Special Terms and Conditions – 5R01EB015611-07

Clinical Trial Indicator: No

This award does not support any NIH-defined Clinical Trials. See the NIH Grants Policy Statement



### CONSORTIUM/CONTRACTUAL COSTS

This award includes funds for consortium activity with:

- University of Texas Health Science Center at Rio Grande Valley (UTGRV).
- University of Oxford, United Kingdom

Consortia are to be established and administered as described in the NIHGPS section 15 Consortium Agreements.

[http://grants.nih.gov/grants/policy/nihgps/HTML5/section\\_15/15\\_consortium\\_agreements.htm](http://grants.nih.gov/grants/policy/nihgps/HTML5/section_15/15_consortium_agreements.htm)

### SALARY CAP

None of the funds in this award shall be used to pay the salary of an individual at a rate in excess of the current salary cap per year. Current salary cap levels can be found at the following URL's:

<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-19-099.html>

[http://grants.nih.gov/grants/policy/salcap\\_summary.htm](http://grants.nih.gov/grants/policy/salcap_summary.htm)

### GRADUATE STUDENT COMPENSATION

The maximum amount NIH will award for compensation of a graduate student (salary, fringe benefits and tuition remission) receiving support from a research grant is the zero-level Kirschstein-NRSA stipend in effect when NIH issues the grant award (see current levels posted at <https://grants.nih.gov/grants/guide/notice-files/NOT-OD-19-036.html>)

The NIBIB home page is: <http://www.nibib.nih.gov/>

### STAFF CONTACTS

The Grants Management Specialist is responsible for the negotiation, award and administration of this project and for interpretation of Grants Administration policies and provisions. The Program Official is responsible for the scientific, programmatic and technical aspects of this project. These individuals work together in overall project administration. Prior approval requests (signed by an Authorized Organizational Representative) should be submitted in writing to the Grants Management Specialist. Requests may be made via e-mail.

**Grants Management Specialist:** Angelos Bacas

**Email:** ab329b@nih.gov **Phone:** (301) 451-4785 **Fax:** (301) 451-5735

**Program Official:** Qi Duan

**Email:** qi.duan@nih.gov **Phone:** 301-827-4674

### SPREADSHEET SUMMARY

**GRANT NUMBER:** 5R01EB015611-07

**INSTITUTION:** UNIVERSITY OF MARYLAND BALTIMORE

| Budget                                 | Year 7    |
|--|-----------|
| Salaries and Wages                     | \$116,623 |
| Fringe Benefits                        | \$33,407  |
| Personnel Costs (Subtotal)             | \$150,030 |
| Consultant Services                    | \$7,000   |
| Materials & Supplies                   | \$3,500   |
| Travel                                 | \$3,500   |
| Other                                  | \$5,336   |
| Subawards/Consortium/Contractual Costs | \$138,330 |
| TOTAL FEDERAL DC                       | \$307,696 |
| TOTAL FEDERAL F&A                      | \$92,305  |
| TOTAL COST                             | \$400,001 |

|                                     |        |
|-------------------------------------|--------|
| Facilities and Administrative Costs | Year 7 |
|-------------------------------------|--------|

|                 |           |
|-----------------|-----------|
| F&A Cost Rate 1 | 54.5%     |
| F&A Cost Base 1 | \$169,367 |
| F&A Costs 1     | \$92,305  |

## A. COVER PAGE

|  |   |
|--|---|
| <b>Project Title:</b> Solar-Eclipse Computational Tools for Imaging Genetics   |   |
| <b>Grant Number:</b> 5R01EB015611-07   | <b>Project/Grant Period:</b> 08/01/2012 - 07/31/2020  |
| <b>Reporting Period:</b> 08/01/2018 - 07/31/2019   | <b>Requested Budget Period:</b> 08/01/2019 - 07/31/2020   |
| <b>Report Term Frequency:</b> Annual   | <b>Date Submitted:</b> 06/03/2019   |
| <b>Program Director/Principal Investigator Information:</b><br>PETER V KOCHUNOV , MS MS PHD<br><b>Phone number:</b> (410) 402-6110<br><b>Email:</b> <input type="text" value="Personal Info"/>       | <b>Recipient Organization:</b><br>UNIVERSITY OF MARYLAND BALTIMORE<br>UNIVERSITY OF MARYLAND BALTIMORE<br>620 W LEXINGTON ST, 4TH FL<br>BALTIMORE, MD 212011508<br><br><b>DUNS:</b> 188435911<br><b>EIN:</b> 1526002036A1<br><br><b>RECIPIENT ID:</b> |
| <b>Change of Contact PD/PI:</b> N/A  |   |
| <b>Administrative Official:</b><br>MARIE COOLAHAN<br>620 W. Lexington Street<br>4th. Floor<br>Baltimore, MD 21201<br><br><b>Phone number:</b> 410-706-0011<br><b>Email:</b> m_coolahan@umaryland.edu | <b>Signing Official:</b><br>MARIE COOLAHAN<br>620 W. Lexington Street<br>4th. Floor<br>Baltimore, MD 21201<br><br><b>Phone number:</b> 410-706-0011<br><b>Email:</b> m_coolahan@umaryland.edu   |
| <b>Human Subjects:</b> No  | <b>Vertebrate Animals:</b> No   |
| <b>hESC:</b> No  | <b>Inventions/Patents:</b> No   |



**B. ACCOMPLISHMENTS****B.1 WHAT ARE THE MAJOR GOALS OF THE PROJECT?**

Aim 1. To shift imaging genetics toward richer, higher resolution imaging analyses and denser genome examination through high performance computing. The shift in imaging genetics toward WGS genotyping and high-resolution multimodal imaging data necessitates improvement of computational efficiency of likelihood calculations. To speed calculations up by 105-6-fold we will implement high-performance computing: novel data decompositions and single-step algorithmic techniques and integration of Massive Universal Linear Model (MULM) GPU library of genetic tools for massively parallel genetic analyses. These developments will enable interactive WGS and GWAS analyses for Big Data project by implementing SOLAR-Eclipse in web-analyses portals such as HCP Dashboard and ENIGMAVis.

Aim 2. To accelerate data sharing and replication in imaging genetics. Demands for high-performance computing and greater reproducibility and transparency in scientific research require a new data format optimized for imaging genetics applications and easy sharing of provenance. Expanding on the work of the International Neuroinformatics Coordinating Facility's Neuroimaging Data Sharing Task Force, we have assembled a panel of community experts to develop a draft of imaging genetic format based on existing neuroimaging formats along with extending on-going provenance efforts to imaging genetic research. We will submit this format and API for formal registration with NIF.

Aim 3. To implement and exploit empirical kinship methods. Empirical kinship algorithms that directly measure the degree of shared genetic variance (such as those used in GCTA/ REACTA and MEGHA) will be integrated for performing polygenic and Quantitative Trait Loci Linkage (QTL-L) analyses in the related, unrelated and mega-genetic samples. We propose to re-invent the Quantitative Trait Loci Linkage (QTL-L) methods for localizing QTLs based on simple empirical similarity in larger (1cM) regions of DNA instead of per-locus GWA-SNP analysis. This will answer questions such as localization of chromosomal segments that are responsible for normal and disorder-related variability in neuroimaging traits. Empirical QTL-L analyses will power chromosomal localization studies with no sharing of raw genotypes for our Big Data partners.

Aim 4. Interactive improvement of developed tools in collaboration with 'big data' partners. Methods developed in Aims 1-3 will 'push' the scientific aims of our Big Data partners, who committed a large (N=10K) sample and effort for three collaborative studies. The high-performance imaging genetics computing and empirical QTL-L techniques (Aims 1 and 3) will be honed by performing the largest genetic localization analyses with ENIGMA, ACP and GOBS projects, and by integrating voxel-wise GWAS analyses in web-analysis portals. Likewise, the utility of new format for data and workflow sharing (Aim 2) will be honed for multi-site Big Data research. Finally, we will develop and rank pioneering resting-state FMRI endophenotypes for Big Data research by demonstrating consistent heritability across samples and pleiotropy with mental disorders. The feedback gathered from our partners will sharpen SOLAR-Eclipse tools for imaging genetics community. We will continue to develop annual workshop at Imaging Genetics Conference to educate our users and disseminate new methods.

**B.1.a Have the major goals changed since the initial competing award or previous report?**

No

**B.2 WHAT WAS ACCOMPLISHED UNDER THESE GOALS?**

File uploaded: Goals.pdf

**B.3 COMPETITIVE REVISIONS/ADMINISTRATIVE SUPPLEMENTS**

For this reporting period, is there one or more Revision/Supplement associated with this award for which reporting is required?

No

**B.4 WHAT OPPORTUNITIES FOR TRAINING AND PROFESSIONAL DEVELOPMENT HAS THE PROJECT PROVIDED?**

File uploaded: Opportunities for training.pdf

**B.5 HOW HAVE THE RESULTS BEEN DISSEMINATED TO COMMUNITIES OF INTEREST?**

NOTHING TO REPORT

**B.6 WHAT DO YOU PLAN TO DO DURING THE NEXT REPORTING PERIOD TO ACCOMPLISH THE GOALS?**

For the next reporting period, the work in Aims 1-3 are focused on continued development of pipeline to perform the task of voxel-wise GWAS study in under 24 hours on a single server. The voxel-wise GWAS was always the holy grail of the imaging genetic approaches. However, the long execution time – thousand of server hours led to very few studies. By combining the hardware and software acceleration approaching – SOLAR-Eclipse we are confident in being able to accomplish this. The voxel-wise GWAS pipeline will support our partners' studies in Aim 4. It will be the basis of renewal proposal that we plan to submit in the fall/winter of 2019.

We plan to continue development to support the large NIH-funded imaging genetic initiatives. Our focus is on the voxel-wise GWAS studies in large populations such as Human Connectome Project to derive the maps for genetic influence over the brain.

The project has been used for training of MD/PhD student Eithan Kotkowski. Dr. Kochunov is a member of Eithan's dissertation committee.



## C. PRODUCTS

## C.1 PUBLICATIONS

Are there publications or manuscripts accepted for publication in a journal or other publication (e.g., book, one-time publication, monograph) during the reporting period resulting directly from this award?

Yes

## Publications Reported for this Reporting Period

| Public Access Compliance | Citation  |
|--------------------------|---|
| Complete                 | Winkler AM, Webster MA, Vidaurre D, Nichols TE, Smith SM. Multi-level block permutation. <i>NeuroImage</i> . 2015 December;123:253-68. PubMed PMID: 26074200; PubMed Central PMCID: PMC4644991; DOI: 10.1016/j.neuroimage.2015.05.092.  |
| Complete                 | Wang Q, Chen R, JaJa J, Jin Y, Hong LE, Herskovits EH. Connectivity-Based Brain Parcellation: A Connectivity-Based Atlas for Schizophrenia Research. <i>Neuroinformatics</i> . 2016 January;14(1):83-97. PubMed PMID: 26433899; PubMed Central PMCID: PMC4915929; DOI: 10.1007/s12021-015-9280-7.   |
| Complete                 | Winkler AM, Ridgway GR, Douaud G, Nichols TE, Smith SM. Faster permutation inference in brain imaging. <i>NeuroImage</i> . 2016 November 1;141:502-516. PubMed PMID: 27288322; PubMed Central PMCID: PMC5035139; DOI: 10.1016/j.neuroimage.2016.05.068.   |
| Complete                 | Tao C, Nichols TE, Hua X, Ching CRK, Rolls ET, Thompson PM, Feng J. Generalized reduced rank latent factor regression for high dimensional tensor fields, and neuroimaging-genetic applications. <i>NeuroImage</i> . 2017 January 1;144(Pt A):35-57. PubMed PMID: 27666385; PubMed Central PMCID: PMC5798650; DOI: 10.1016/j.neuroimage.2016.08.027.  |
| Complete                 | McGuire SA, Wijtenburg SA, Sherman PM, Rowland LM, Ryan M, Sladky JH, Kochunov PV. Reproducibility of quantitative structural and physiological MRI measurements. <i>Brain and behavior</i> . 2017 September;7(9):e00759. PubMed PMID: 28948069; PubMed Central PMCID: PMC5607538; DOI: 10.1002/brb3.759.   |
| Complete                 | Petrov D, Gutman BA, Yu SJ, van Erp TGM, Turner JA, Schmaal L, Veltman D, Wang L, Alpert K, Isaev D, Zavaliangos-Petropulu A, Ching CRK, Calhoun V, Glahn D, Satterthwaite TD, Andreasen OA, Borgwardt S, Howells F, Groenewold N, Voineskos A, Radua J, Potkin SG, Crespo-Facorro B, Tordesillas-Gutiérrez D, Shen L, Lebedeva I, Spalletta G, Donohoe G, Kochunov P, Rosa PGP, James A, Dannlowski U, Baune BT, Aleman A, Gotlib IH, Walter H, Walter M, Soares JC, Ehrlich S, Gur RC, Doan NT, Agartz I, Westlye LT, Harrisberger F, Riecher-Rössler A, Uhlmann A, Stein DJ, Dickie EW, Pomarol-Clotet E, Fuentes-Claramonte P, Canales-Rodríguez EJ, Salvador R, Huang AJ, Roiz-Santiañez R, Cong S, Tomyshv A, Piras F, Vecchio D, Banaj N, Ciullo V, Hong E, Busatto G, Zanetti MV, Serpa MH, Cervenka S, Kelly S, Grotegerd D, Sacchet MD, Veer IM, Li M, Wu MJ, Irungu B, Walton E, Thompson PM. Machine Learning for Large-Scale Quality Control of 3D Shape Models in Neuroimaging. <i>Machine learning in medical imaging. MLMI (Workshop)</i> . 2017 September 7;10541:371-378. PubMed PMID: 30035274; PubMed Central PMCID: PMC6049825; DOI: 10.1007/978-3-319-67389-9_43. |
| Complete                 | Shukla DK, Wijtenburg SA, Chen H, Chiappelli JJ, Kochunov P, Hong LE, Rowland LM. Anterior Cingulate Glutamate and GABA Associations on Functional Connectivity in Schizophrenia. <i>Schizophrenia bulletin</i> . 2018 June 15. PubMed PMID: 29912445; PubMed Central PMCID: PMC6483591; DOI: 10.1093/schbul/sby075.  |
| PMC Journal - In process | Chen YH, Howell B, Edgar JC, Huang M, Kochunov P, Hunter MA, Wootton C, Lu BY, Bustillo J, Sadek JR, Miller GA, Cañive JM. Associations and Heritability of Auditory Encoding, Gray Matter, and Attention in Schizophrenia. <i>Schizophrenia bulletin</i> . 2018 August 7. PubMed PMID: 30099543; DOI: 10.1093/schbul/sby111.   |
| Complete                 | Du X, Rowland LM, Summerfelt A, Wijtenburg A, Chiappelli J, Wisner K, Kochunov P, Choa FS, Hong LE. TMS evoked N100 reflects local GABA and glutamate balance. <i>Brain stimulation</i> . 2018 September;11(5):1071-1079. PubMed PMID: 29759942; PubMed Central PMCID: PMC6109427; DOI: 10.1016/j.brs.2018.05.002.  |
| Complete                 | Adhikari BM, Jahanshad N, Shukla D, Turner J, Grotegerd D, Dannlowski U, Kugel H,   |

|                          |   |
|--------------------------|---|
|                          | Engelen J, Dietsche B, Krug A, Kircher T, Fieremans E, Veraart J, Novikov DS, Boedhoe PSW, van der Werf YD, van den Heuvel OA, Ipser J, Uhlmann A, Stein DJ, Dickie E, Voineskos AN, Malhotra AK, Pizzagalli F, Calhoun VD, Waller L, Veer IM, Walter H, Buchanan RW, Glahn DC, Hong LE, Thompson PM, Kochunov P. A resting state fMRI analysis pipeline for pooling inference across diverse cohorts: an ENIGMA rs-fMRI protocol. <i>Brain imaging and behavior</i> . 2018 September 6. PubMed PMID: 30191514; PubMed Central PMCID: PMC6401353; DOI: 10.1007/s11682-018-9941-x.   |
| PMC Journal - In process | Chen S, Xing Y, Kang J, Kochunov P, Hong LE. Bayesian modeling of dependence in brain connectivity data. <i>Biostatistics (Oxford, England)</i> . 2018 September 10. PubMed PMID: 30203093; DOI: 10.1093/biostatistics/kxy046.  |
| Complete                 | Du X, Rowland LM, Summerfelt A, Choa FS, Wittenberg GF, Wisner K, Wijtenburg A, Chiappelli J, Kochunov P, Hong LE. Cerebellar-Stimulation Evoked Prefrontal Electrical Synchrony Is Modulated by GABA. <i>Cerebellum (London, England)</i> . 2018 October;17(5):550-563. PubMed PMID: 29766458; PubMed Central PMCID: PMC6237666; DOI: 10.1007/s12311-018-0945-2.   |
| PMC Journal - In process | Mollon J, Knowles EEM, Mathias SR, Gur R, Peralta JM, Weiner DJ, Robinson EB, Gur RE, Blangero J, Almasy L, Glahn DC. Genetic influence on cognitive development between childhood and adulthood. <i>Molecular psychiatry</i> . 2018 October 19. PubMed PMID: 30644433; DOI: 10.1038/s41380-018-0277-0.   |
| Complete                 | Viviano JD, Buchanan RW, Calarco N, Gold JM, Foussias G, Bhagwat N, Stefanik L, Hawco C, DeRosse P, Argyelan M, Turner J, Chavez S, Kochunov P, Kingsley P, Zhou X, Malhotra AK, Voineskos AN. Resting-State Connectivity Biomarkers of Cognitive Performance and Social Function in Individuals With Schizophrenia Spectrum Disorder and Healthy Control Subjects. <i>Biological psychiatry</i> . 2018 November 1;84(9):665-674. PubMed PMID: 29779671; PubMed Central PMCID: PMC6177285; DOI: 10.1016/j.biopsych.2018.03.013.   |
| Complete                 | van Erp TGM, Walton E, Hibar DP, Schmaal L, Jiang W, Glahn DC, Pearlson GD, Yao N, Fukunaga M, Hashimoto R, Okada N, Yamamori H, Bustillo JR, Clark VP, Agartz I, Mueller BA, Cahn W, de Zwart SMC, Hulshoff Pol HE, Kahn RS, Ophoff RA, van Haren NEM, Andreassen OA, Dale AM, Doan NT, Gurholt TP, Hartberg CB, Haukvik UK, Jørgensen KN, Lagerberg TV, Melle I, Westlye LT, Gruber O, Kraemer B, Richter A, Zilles D, Calhoun VD, Crespo-Facorro B, Roiz-Santiañez R, Tordesillas-Gutiérrez D, Loughland C, Carr VJ, Catts S, Cropley VL, Fullerton JM, Green MJ, Henskens FA, Jablensky A, Lenroot RK, Mowry BJ, Michie PT, Pantelis C, Quidé Y, Schall U, Scott RJ, Cairns MJ, Seal M, Tooney PA, Rasser PE, Cooper G, Shannon Weickert C, Weickert TW, Morris DW, Hong E, Kochunov P, Beard LM, Gur RE, Gur RC, Satterthwaite TD, Wolf DH, Belger A, Brown GG, Ford JM, Macciardi F, Mathalon DH, O'Leary DS, Potkin SG, Preda A, Voyvodic J, Lim KO, McEwen S, Yang F, Tan Y, Tan S, Wang Z, Fan F, Chen J, Xiang H, Tang S, Guo H, Wan P, Wei D, Bockholt HJ, Ehrlich S, Wolthuisen RPF, King MD, Shoemaker JM, Sponheim SR, De Haan L, Koenders L, Machielsen MW, van Amelsvoort T, Veltman DJ, Assogna F, Banaj N, de Rossi P, Iorio M, Piras F, Spalletta G, McKenna PJ, Pomarol-Clotet E, Salvador R, Corvin A, Donohoe G, Kelly S, Whelan CD, Dickie EW, Rotenberg D, Voineskos AN, Ciufolini S, Radua J, Dazzan P, Murray R, Reis Marques T, Simmons A, Borgwardt S, Egloff L, Harrisberger F, Riecher-Rössler A, Smieskova R, Alpert KI, Wang L, Jönsson EG, Koops S, Sommer IEC, Bertolino A, Bonvino A, Di Giorgio A, Neilson E, Mayer AR, Stephen JM, Kwon JS, Yun JY, Cannon DM, McDonald C, Lebedeva I, Tomyshev AS, Akhadorov T, Kaleda V, Fatouros-Bergman H, Flyckt L, Busatto GF, Rosa PGP, Serpa MH, Zanetti MV, Hoschl C, Skoch A, Spaniel F, Tomecek D, Hagenaars SP, McIntosh AM, Whalley HC, Lawrie SM, Knöchel C, Oertel-Knöchel V, Stäblein M, Howells FM, Stein DJ, Temmingh HS, Uhlmann A, Lopez-Jaramillo C, Dima D, McMahon A, Faskowitz JI, Gutman BA, Jahanshad N, Thompson PM, Turner JA. Cortical Brain Abnormalities in 4474 Individuals With Schizophrenia and 5098 Control Subjects via the Enhancing Neuro Imaging Genetics Through Meta Analysis (ENIGMA) Consortium. <i>Biological psychiatry</i> . 2018 November 1;84(9):644-654. PubMed PMID: 29960671; PubMed Central PMCID: PMC6177304; DOI: 10.1016/j.biopsych.2018.04.023. |
| Complete                 | Adhikari BM, Jahanshad N, Shukla D, Glahn DC, Blangero J, Fox PT, Reynolds RC, Cox RW, Fieremans E, Veraart J, Novikov DS, Nichols TE, Hong LE, Thompson PM, Kochunov P. Comparison of heritability estimates on resting state fMRI connectivity phenotypes using the ENIGMA analysis pipeline. <i>Human brain mapping</i> . 2018 December;39(12):4893-4902. PubMed PMID: 30052318; PubMed Central PMCID: PMC6218292; DOI: 10.1002/hbm.24331.   |
| PMC Journal - In process | Shukla DK, Chiappelli JJ, Sampath H, Kochunov P, Hare SM, Wisner K, Rowland LM,   |



|                          |   |
|--------------------------|---|
|                          | Hong LE. Aberrant Frontostriatal Connectivity in Negative Symptoms of Schizophrenia. Schizophrenia bulletin. 2018 December 21. PubMed PMID: 30576563; DOI: 10.1093/schbul/sby165.   |
| Complete                 | Hawco C, Viviano JD, Chavez S, Dickie EW, Calarco N, Kochunov P, Argyelan M, Turner JA, Malhotra AK, Buchanan RW, Voineskos AN. A longitudinal human phantom reliability study of multi-center T1-weighted, DTI, and resting state fMRI data. Psychiatry research. Neuroimaging. 2018 December 30;282:134-142. PubMed PMID: 29945740; PubMed Central PMCID: PMC6482446; DOI: 10.1016/j.psychres.2018.06.004.  |
| Complete                 | Du X, Choa FS, Chiappelli J, Wisner KM, Wittenberg G, Adhikari B, Bruce H, Rowland LM, Kochunov P, Hong LE. Aberrant Middle Prefrontal-Motor Cortex Connectivity Mediates Motor Inhibitory Biomarker in Schizophrenia. Biological psychiatry. 2019 January 1;85(1):49-59. PubMed PMID: 30126607; PubMed Central PMCID: PMC6289820; DOI: 10.1016/j.biopsych.2018.06.007.   |
| Complete                 | Wijtenburg SA, Near J, Korenic SA, Gaston FE, Chen H, Mikkelsen M, Chen S, Kochunov P, Hong LE, Rowland LM. Comparing the reproducibility of commonly used magnetic resonance spectroscopy techniques to quantify cerebral glutathione. Journal of magnetic resonance imaging : JMIR. 2019 January;49(1):176-183. PubMed PMID: 29659065; PubMed Central PMCID: PMC6191387; DOI: 10.1002/jmri.26046.   |
| Complete                 | Chen H, Huffman JE, Brody JA, Wang C, Lee S, Li Z, Gogarten SM, Sofer T, Bielak LF, Bis JC, Blangero J, Bowler RP, Cade BE, Cho MH, Correa A, Curran JE, de Vries PS, Glahn DC, Guo X, Johnson AD, Kardia S, Kooperberg C, Lewis JP, Liu X, Mathias RA, Mitchell BD, O'Connell JR, Peyser PA, Post WS, Reiner AP, Rich SS, Rotter JI, Silverman EK, Smith JA, Vasani RS, Wilson JG, Yanek LR, Redline S, Smith NL, Boerwinkle E, Borecki IB, Cupples LA, Laurie CC, Morrison AC, Rice KM, Lin X. Efficient Variant Set Mixed Model Association Tests for Continuous and Binary Traits in Large-Scale Whole-Genome Sequencing Studies. American journal of human genetics. 2019 February 7;104(2):260-274. PubMed PMID: 30639324; PubMed Central PMCID: PMC6372261; DOI: 10.1016/j.ajhg.2018.12.012. |
| Complete                 | Kochunov P, Patel B, Ganjgahi H, Donohue B, Ryan M, Hong EL, Chen X, Adhikari B, Jahanshad N, Thompson PM, Van't Ent D, den Braber A, de Geus EJC, Brouwer RM, Boomsma DI, Hulshoff Pol HE, de Zubicaray GI, McMahon KL, Martin NG, Wright MJ, Nichols TE. Homogenizing Estimates of Heritability Among SOLAR-Eclipse, OpenMx, APACE, and FPHI Software Packages in Neuroimaging Data. Frontiers in neuroinformatics. 2019 March 12;13:16. PubMed PMID: 30914942; PubMed Central PMCID: PMC6422938; DOI: 10.3389/fninf.2019.00016.  |
| PMC Journal - In process | Glahn DC, Nimgaonkar VL, Raventos H, Contreras J, McIntosh AM, Thomson PA, Jablensky A, McCarthy NS, Charlesworth JC, Blackburn NB, Peralta JM, Knowles EEM, Mathias SR, Ament SA, McMahon FJ, Gur RC, Bucan M, Curran JE, Almasy L, Gur RE, Blangero J. Rediscovering the value of families for psychiatric genetics research. Molecular psychiatry. 2019 April;24(4):523-535. PubMed PMID: 29955165; DOI: 10.1038/s41380-018-0073-x.  |
| Complete                 | Knowles EEM, Mathias SR, Mollon J, Rodrigue A, Koenis MMG, Dyer TD, Goring HHH, Curran JE, Olvera RL, Duggirala R, Almasy L, Blangero J, Glahn DC. A QTL on chromosome 3q23 influences processing speed in humans. Genes, brain, and behavior. 2019 April;18(4):e12530. PubMed PMID: 30379395; PubMed Central PMCID: PMC6458095; DOI: 10.1111/gbb.12530.  |
| Complete                 | Kochunov P, Donohue B, Mitchell BD, Ganjgahi H, Adhikari B, Ryan M, Medland SE, Jahanshad N, Thompson PM, Blangero J, Fieremans E, Novikov DS, Marcus D, Van Essen DC, Glahn DC, Elliot Hong L, Nichols TE. Genomic kinship construction to enhance genetic analyses in the human connectome project data. Human brain mapping. 2019 April 1;40(5):1677-1688. PubMed PMID: 30496643; PubMed Central PMCID: PMC6483073; DOI: 10.1002/hbm.24479.  |
| Complete                 | Fan F, Xiang H, Tan S, Yang F, Fan H, Guo H, Kochunov P, Wang Z, Hong LE, Tan Y. Subcortical structures and cognitive dysfunction in first episode schizophrenia. Psychiatry research. Neuroimaging. 2019 April 30;286:69-75. PubMed PMID: 30921760; PubMed Central PMCID: PMC6475899; DOI: 10.1016/j.psychres.2019.01.003.   |
| Complete                 | Eklund A, Knutsson H, Nichols TE. Cluster failure revisited: Impact of first level design and physiological noise on cluster false positive rates. Human brain mapping. 2019 May;40(7):2017-2032. PubMed PMID: 30318709; PubMed Central PMCID: PMC6445744; DOI: 10.1002/hbm.24350.  |



**C.2 WEBSITE(S) OR OTHER INTERNET SITE(S)**

Nothing to report

**C.3 TECHNOLOGIES OR TECHNIQUES**

NOTHING TO REPORT

**C.4 INVENTIONS, PATENT APPLICATIONS, AND/OR LICENSES**

Have inventions, patent applications and/or licenses resulted from the award during the reporting period? No

If yes, has this information been previously provided to the PHS or to the official responsible for patent matters at the grantee organization?

**C.5 OTHER PRODUCTS AND RESOURCE SHARING**

Nothing to report

## D. PARTICIPANTS

## D.1 WHAT INDIVIDUALS HAVE WORKED ON THE PROJECT?

| Commons ID | S/K | Name               | Degree(s)  | Role  | Cal    | Aca | Sum | Foreign Org | Country | SS |
|------------|-----|--------------------|------------|-------|--------|-----|-----|-------------|---------|----|
| KOCHUNOV   | Y   | KOCHUNOV, PETER V. | MS,MS,P HD | PD/PI | EFFORT |     |     |             |         | NA |

**Glossary of acronyms:**

S/K - Senior/Key

DOB - Date of Birth

Cal - Person Months (Calendar)

Aca - Person Months (Academic)

Sum - Person Months (Summer)

Foreign Org - Foreign Organization Affiliation

SS - Supplement Support

RE - Reentry Supplement

DI - Diversity Supplement

OT - Other

NA - Not Applicable

## D.2 PERSONNEL UPDATES

## D.2.a Level of Effort

Will there be, in the next budget period, either (1) a reduction of 25% or more in the level of effort from what was approved by the agency for the PD/PI(s) or other senior/key personnel designated in the Notice of Award, or (2) a reduction in the level of effort below the minimum amount of effort required by the Notice of Award?

No

## D.2.b New Senior/Key Personnel

Are there, or will there be, new senior/key personnel?

No

## D.2.c Changes in Other Support

Has there been a change in the active other support of senior/key personnel since the last reporting period?

No

## D.2.d New Other Significant Contributors

Are there, or will there be, new other significant contributors?

No

## D.2.e Multi-PI (MPI) Leadership Plan

Will there be a change in the MPI Leadership Plan for the next budget period?

NA

## E. IMPACT

**E.1 WHAT IS THE IMPACT ON THE DEVELOPMENT OF HUMAN RESOURCES?**

Not Applicable

**E.2 WHAT IS THE IMPACT ON PHYSICAL, INSTITUTIONAL, OR INFORMATION RESOURCES THAT FORM INFRASTRUCTURE?**

NOTHING TO REPORT

**E.3 WHAT IS THE IMPACT ON TECHNOLOGY TRANSFER?**

Not Applicable

**E.4 WHAT DOLLAR AMOUNT OF THE AWARD'S BUDGET IS BEING SPENT IN FOREIGN COUNTRY(IES)?**

NOTHING TO REPORT



## F. CHANGES

**F.1 CHANGES IN APPROACH AND REASONS FOR CHANGE**

Not Applicable

**F.2 ACTUAL OR ANTICIPATED CHALLENGES OR DELAYS AND ACTIONS OR PLANS TO RESOLVE THEM**

NOTHING TO REPORT

**F.3 SIGNIFICANT CHANGES TO HUMAN SUBJECTS, VERTEBRATE ANIMALS, BIOHAZARDS, AND/OR SELECT AGENTS****F.3.a Human Subjects**

No Change

**F.3.b Vertebrate Animals**

No Change

**F.3.c Biohazards**

No Change

**F.3.d Select Agents**

No Change

## G. SPECIAL REPORTING REQUIREMENTS

## G.1 SPECIAL NOTICE OF AWARD TERMS AND FUNDING OPPORTUNITIES ANNOUNCEMENT REPORTING REQUIREMENTS

NOTHING TO REPORT

## G.2 RESPONSIBLE CONDUCT OF RESEARCH

Not Applicable

## G.3 MENTOR'S REPORT OR SPONSOR COMMENTS

Not Applicable

## G.4 HUMAN SUBJECTS

## G.4.a Does the project involve human subjects?

No

## G.4.b Inclusion Enrollment Data

## G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

## G.5 HUMAN SUBJECTS EDUCATION REQUIREMENT

Are there personnel on this project who are newly involved in the design or conduct of human subjects research?

## G.6 HUMAN EMBRYONIC STEM CELLS (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

## G.7 VERTEBRATE ANIMALS

Does this project involve vertebrate animals?

No

## G.8 PROJECT/PERFORMANCE SITES

| Organization Name:                                       | DUNS      | Congressional District | Address  |
|--|-----------|------------------------|--|
| <b>Primary:</b> University of Maryland, Baltimore        | 188435911 | MD-07                  | UNIVERSITY OF MARYLAND BALTIMORE<br>PO Box 21247<br>Baltimore MD 21228                           |
| University of Maryland, Baltimore                        | 188435911 | MD-007                 | UNIVERSITY OF MARYLAND BALTIMORE<br>Office of Research and Development<br>Baltimore MD 212011508 |
| University of Texas Health Science Center at San Antonio | 800772162 | TX-021                 | 7703 Floyd Curl Drive, Mail Code 7828<br>San Antonio TX 782293900                                |
|  |           |                        |  |

|   |           |        |   |
|---|-----------|--------|---|
| University of Warwick   | 231745683 | 00-000 | University House<br>Kirby Corner Road<br>Coventry, West Midlands  |
| University of Maryland<br>Baltimore   | 188435911 | MD-007 | Maryland Psychiatric Research Center<br>Grounds of Spring Grove Hospital Center<br>Baltimore MD 212284663 |
| UNIVERSITY OF<br>MARYLAND,<br>BALTIMORE, OFFICE<br>OF RESEARCH AND<br>DEVELOPMENT | 188435911 |        | UNIVERSITY OF MARYLAND BALTIMORE<br>620 W LEXINGTON ST, 4TH FL<br>BALTIMORE MD 212011508                  |
| University of Maryland,<br>Baltimore  | 188435911 | MD-07  | UNIVERSITY OF MARYLAND BALTIMORE<br>PO Box 21247<br>Baltimore MD 212011508                                |
| University of Maryland,<br>Baltimore  | 188435911 | MD-007 | UNIVERSITY OF MARYLAND BALTIMORE<br>Office of Research and Development<br>Baltimore MD 212011508          |
| University of Texas<br>Health Science Center at<br>San Antonio                    | 800772162 | TX-021 | 7703 Floyd Curl Drive, Mail Code 7828<br>San Antonio TX 782293900   |
| University of Warwick   | 231745683 | 00-000 | University House<br>Kirby Corner Road<br>Coventry, West Midlands  |
| University of Maryland<br>Baltimore   | 188435911 | MD-007 | Maryland Psychiatric Research Center<br>Grounds of Spring Grove Hospital Center<br>Baltimore MD 212284663 |
| UNIVERSITY OF<br>MARYLAND,<br>BALTIMORE, OFFICE<br>OF RESEARCH AND<br>DEVELOPMENT | 188435911 |        | UNIVERSITY OF MARYLAND BALTIMORE<br>620 W LEXINGTON ST, 4TH FL<br>BALTIMORE MD 212011508                  |
| University of Maryland,<br>Baltimore  | 188435911 | MD-07  | UNIVERSITY OF MARYLAND BALTIMORE<br>PO Box 21247<br>Baltimore MD 21228                                    |
| University of Maryland,<br>Baltimore  | 188435911 | MD-007 | UNIVERSITY OF MARYLAND BALTIMORE<br>Office of Research and Development<br>Baltimore MD 212011508          |
| University of Texas<br>Health Science Center at<br>San Antonio                    | 800772162 | TX-021 | 7703 Floyd Curl Drive, Mail Code 7828<br>San Antonio TX 782293900   |
| University of Warwick   | 231745683 | 00-000 | University House<br>Kirby Corner Road<br>Coventry, West Midlands  |
| University of Maryland<br>Baltimore   | 188435911 | MD-007 | Maryland Psychiatric Research Center<br>Grounds of Spring Grove Hospital Center<br>Baltimore MD 212284663 |
| UNIVERSITY OF<br>MARYLAND,<br>BALTIMORE, OFFICE<br>OF RESEARCH AND<br>DEVELOPMENT | 188435911 |        | UNIVERSITY OF MARYLAND BALTIMORE<br>620 W LEXINGTON ST, 4TH FL<br>BALTIMORE MD 212011508                  |
| University of Maryland,<br>Baltimore  | 188435911 | MD-07  | UNIVERSITY OF MARYLAND BALTIMORE<br>PO Box 21247<br>Baltimore MD 212011508                                |



|  |           |        |   |
|--|-----------|--------|---|
| University of Maryland, Baltimore                        | 188435911 | MD-007 | UNIVERSITY OF MARYLAND BALTIMORE<br>Office of Research and Development<br>Baltimore MD 212011508          |
| University of Texas Health Science Center at San Antonio | 800772162 | TX-021 | 7703 Floyd Curl Drive, Mail Code 7828<br>San Antonio TX 782293900   |
| University of Warwick                                    | 231745683 | 00-000 | University House<br>Kirby Corner Road<br>Coventry, West Midlands  |
| University of Maryland Baltimore                         | 188435911 | MD-007 | Maryland Psychiatric Research Center<br>Grounds of Spring Grove Hospital Center<br>Baltimore MD 212284663 |

**G.9 FOREIGN COMPONENT**

No foreign component

**G.10 ESTIMATED UNOBLIGATED BALANCE****G.10.a** Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?

No

**G.11 PROGRAM INCOME**

Is program income anticipated during the next budget period?

No

**G.12 F&A COSTS**

Is there a change in performance sites that will affect F&amp;A costs?

No

## QVR NIH Business System (NBS) Accounting Details

[PRINT](#) [DOWNLOAD](#) [CLOSE](#)

PI: KOCHUNOV, PETER V FY: 2019

Total IMPACII Award Amt: \$400,001

### Obligation Details for Project:

5R01EB015611-07

### External Organization:

UNIVERSITY OF MARYLAND BALTIMORE

### Accounting System Totals

**PMS Account Type:** Subaccount:domestic(P)  
**Award Document Number:** REB015611B *Click hyperlink for accounting details for all projects with this document number*

TIMING INFORMATION: QVR gathers disbursement data from NBS/nVision on a nightly basis, however, PMS data in NBS may lag as much as 2 weeks.

|    |         |           |              | Accounting System |                  |                  |                   |
|----|---------|-----------|--------------|-------------------|------------------|------------------|-------------------|
| IC | CAN     | Budget FY | Obligated Dt | Last Disburse. Dt | NBS Obligated \$ | NBS Disbursed \$ | Obligated Balance |
| EB | 8015183 | 2019      | 2019-08-05   |                   | \$ 400,001.00    | \$ 0.00          | \$ 400,001.00     |

### Accounting System Transactions

| Accounting System Transactions |         |      |                     |                  |                |                  |
|--------------------------------|---------|------|---------------------|------------------|----------------|------------------|
| IC                             | CAN     | OCC  | NBS Doc Num         | NBS Transact. Dt | Obligation Amt | Disbursement Amt |
| EB                             | 8015183 | 414E | 380REB015611B*10001 | 2019-08-05       | \$ 400,001.00  | \$ 0.00          |
| <b>Grand Totals:</b>           |         |      |                     |                  | \$ 400,001.00  | \$ 0.00          |