

Task Force to Evaluate the NCI/DOE Collaboration

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Agenda

- Task Force Charge and Duties
- Overview of the NCI/DOE Collaboration
- Process
- Assessments by pilot and for the NCI management and oversight overall
- Lessons learned

Task Force Charge

- Conduct an in-depth technical review of the established projects
- Provide insights and observations on the pilots, programs, and projects
- Make recommendations to indicate if the NCI/DOE collaborations should continue into years four and five and beyond

NCI/DOE Collaboration Task Force Members

Chair

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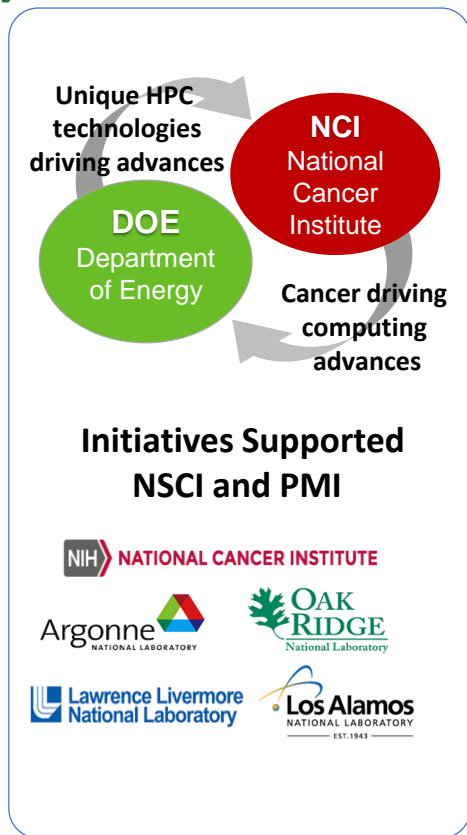
University of California Berkeley

JOINT DESIGN OF ADVANCED COMPUTING SOLUTIONS FOR CANCER (JDACS4C) – 5 YEAR MOU (June 2016)

Close collaboration to share capabilities, approaches, data, and best practices.

This is expected to:

- ***deepen the national understanding of cancer biology*** through the collaborative development and use of simulations, predictive models, and next-generation experimental data;
- ***produce approaches to identify next treatment options through the use of advanced computation*** to rapidly develop, test, and validate predictive models for precision oncology;
- ***transform cancer care*** by applying advanced computational capabilities to population-based cancer data to understand the impact of new diagnostics, treatments and patient factors ***in real world patients***.



3 Pilot Projects

1. A **cellular** level pilot to develop predictive computational models of preclinical therapeutic response
2. A **molecular** level pilot to characterize RAS membrane biology
3. A **population** level pilot for integrating, analyzing and modeling for precision cancer surveillance

JDACS4C includes other programs that were considered outside of the scope of this evaluation, including **Uncertainty Quantification, ATOM,** and **CANDLE**

TF Evaluation Process

- Series of 6 virtual meetings in July – October
- Developed evaluation questions
- Programmatic presentations from the NCI-leads for each pilot project
- Assessed each pilot project individually, as well as the NCI management and oversight of the collaboration as a whole

Evaluation Questions

1. What impact has the collaboration overall, and the pilots specifically, had on the cancer research community?
2. How have the unique DOE HPC capabilities and expertise contributed to cancer research?
3. Has the effort effectively engaged the greater cancer research community, and have they benefitted?
4. Are there additional research opportunities for collaboration with DOE and HPC in cancer?
5. Has the NCI oversight been adequate, and should NCI continue to support this collaboration?

Assessment of Pilot 1: Drug Response and Prediction for Preclinical Screening

- Laudable goal, but launched prematurely
 - Increased efforts should have been placed on experimental data generation, curation, and validation
 - Approached from a purely DL perspective without appropriate considerations for the underlying biological constraints
- Lack of appropriate and ongoing NCI management, oversight, and engagement
- Aggregated data sets developed as part of this effort should be made public
- Pilot should be concluded
 - Productivity not commensurate with investment

Assessment of Pilot 2: Improving Outcomes for RAS-Related Cancers

- Substantially improve outreach and engagement to the broader RAS biology and molecular simulation communities
 - Engagement with biophysics community is good, but can be improved
 - Leveraged unique DOE HPC capabilities
 - Productivity has been acceptable
 - Increased emphasis on experimental validation of computational models
 - Increased collaboration between modelers and biologists; modeling efforts that went into coarse-grain modeling would have benefitted from biology expertise
- Project should continue with emphasis on fine grained modeling, experimental validation and increased community engagement

Assessment of Pilot 3: Population Information Integration, Analysis, and Modeling for Precision Surveillance

- Successful collaboration between NCI SEER registry and DOE teams
 - Reduced the reporting time for five SEER elements, but approach has limited utility beyond the registry community due to data curation differences
 - Leveraged computational expertise rather than HPC capabilities
 - Activities have been insular to SEER registry community
 - Reducing SEER reporting timeline should be a priority
- Pilot should continue with a focus on implementation and community applicability beyond SEER
 - Future directions should be informed by an external advisory group

Assessment of Overall NCI Management of Collaboration

- Lack of appropriate ongoing scientific management from NCI in some cases
 - Pilot 3 team is a good example of a successful collaboration
 - Improve scientific management through interaction with program staff in the extramural divisions with a research portfolio in that area
- NCI extramural community was not appropriately engaged
 - Missed opportunities for leveraging existing knowledge and amplifying impact to the cancer research community
 - Pilots were largely driven by computational considerations, rather than in the context of realistic biologic constraints
 - Provide mechanism for extramural community to collaborate with NCI and DOE

Lessons Learned

- Critical to assess project feasibility in advance of launch
 - More effort should have been placed on project planning to ensure feasibility, data quality and availability, biologic relevance of the developed models, and impact on cancer research
 - Possibly through a competitive process involving NCI and DOE stakeholders
- Projects should have milestones and external oversight
 - Should be early and ongoing assessment about the direction of the projects to ensure relevance and impact on the cancer research community
 - Pilot 1 should have been stopped or rescope'd sooner
- Projects should have closer and ongoing engagement from NCI and connection with the extramural cancer research community
 - Missed opportunities to take advantage of biologic modeling expertise within the NCI-funded community

Conclusions

- Continue the collaboration - NCI/DOE collaboration is uniquely suited to for research that would otherwise be difficult to do
 - Reassess current projects and level of funding
- Increase engagement with the NCI extramural community – teams have been insular and engagement with the NCI computational research and general cancer research community has been minimal
- Increase cancer expertise and oversight for each project
 - Scientific management should be embedded in NCI extramural divisions
 - Create an external scientific advisory group specific for each project
 - New projects should be assessed for appropriateness and feasibility



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