STAR METRICS™

Update & Review of Activities (2013 & 2014)

Federal Demonstration Partnership
Jan 6, 2014
Multi-agency program aimed at documenting a partial set of outputs from federal science investments.

Agencies:
- WH OSTP
- NIH
- NSF
- USDA
- EPA

STAR METRICS
GOVERNANCE

NIH DATA Systems

Lead Entity Executive

Executive Committee

Program Managers

Interagency Working Group
Stakeholders

- Federal Agencies
- Research Institutions
- Social Science
- Community
- Legislative Bodies
- Taxpaying Public

Portfolio Analysis
Research Evaluation
Economic Impact
Communications
Measuring the economic impact of science funding

- **Level I**: Estimating jobs created by federal science awards.

Enabling studies of the portfolio of federal science investments

- **Level II**: A searchable database of science awards from federal agencies
USES OF LEVEL I DATA

- National workforce projections
- Benchmarking impact
- Communications
- Other- Reporting?

Dependent On
  - Data quality
  - Quality of job estimates
  - Representative sampling
State of STAR METRICS

– Level I
  • Input (source data)
  • Process (job calculations)
  • Output (features of report)

– Level II
  • Extend 1 year dataset to 5 year dataset
  • Evaluate usefulness

– Website & Access
  • Update
  • Improve usability
• Documented exact procedures for generation and QA of quarterly reports

• Regenerated and analyzed Level I reports from previous quarter.

• Analyzed SAS code for stress points and improvement opportunities
• Identified problem areas and potential roadblocks for the future

• Level I Workshop on November 12, 2013
  – 52 in person attendees
  – (50 < n < 100) viewed videocast
• **Data Quality**- in all its many dimensions
• **Linkage to other data sets**- to facilitate other uses
• **Recruitment**- (perhaps targeted) to increase sample size
• **Access** (access & access)
• Understanding of the value of this effort through **strategic communications**
Level II-α Open For Comment

- Search awards information from NIH, NSF, NASA, and EPA (2008-2012)

- Password: demo@sm

- Feedback: starmetrics@mail.nih.gov
## Project Search Results

There were 73607 results matching your search criteria.

Click on the column header to sort the results.

### Projects

<table>
<thead>
<tr>
<th>Project Number</th>
<th>Project Title</th>
<th>Contact PI/Project Leader</th>
<th>Organization</th>
<th>FY</th>
<th>Admin IC</th>
<th>Funding IC</th>
<th>FY Total Cost by IC</th>
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<td>CONSERVED FETAL EPIDEMIC SIGNS IN A PRIMATE MODEL OF MATERNAL OBESITY</td>
<td>AAGAARD-TILLERY, KJERSTI MARIE</td>
<td>BAYLOR COLLEGE OF MEDICINE</td>
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<td>3DP2OD001500-01A2</td>
<td>CHARACTERIZATION OF THE FETAL PRIMATE EPIDEMIC AND METABOLOME UNDER IN UTERO</td>
<td>AAGAARD-TILLERY, KJERSTI MARIE</td>
<td>BAYLOR COLLEGE OF MEDICINE</td>
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<td>3R15GM00090-01A1</td>
<td>BINDING AND SPLICING MRNA</td>
<td>TALBERTS, DANIEL PAUL</td>
<td>WILLIAMS COLLEGE</td>
<td>2009</td>
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<td>5P01CA080606-13</td>
<td>P53 - REGULATORS AND EFFECTORS</td>
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<td>MOUNT SNAI SCHOOL OF MEDICINE</td>
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Project Information

3R15GM080690-01S1

Contact PI / Project Leader: AALBERTS, DANIEL PAUL
Awardee Organization: WILLIAMS COLLEGE

Abstract Text:

DESCRIPTION (provided by applicant): Gene expression is often regulated by the binding of small RNAs or proteins to messenger RNA; examples include mRNA splicing, microRNA, and degradation signals. Making more accurate predictions will help uncover the function and cellular activity of binding and splicing mRNA. We propose to: (1) Develop physical-chemical models of small RNAs and proteins binding that modulate gene expression through mRNA binding. Our recently developed oligo-binding algorithm BINDIGO efficiently computes binding free energies. We aim to improve the accuracy with which binding sites can be identified. (2) Improve models of mRNA splicing to understand the role of thermodynamics in alternative splicing and intron/exon segregation, and correlations in the codon frames where introns begin. Our preliminary results show unexpected and significant correlations; they also show energetic biases which may explain how cells find splice junctions. (3) Discover how pre-existing secondary structure influences binding events, and how binding modifies remaining secondary structures. (4) Expand RNA folding algorithms to include binding events. It is estimated that at least 15% of genetic point mutations result in incorrectly spliced mature mRNA. By elucidating the mechanisms and improving the predictions of splicing, it may be possible to design therapeutics. And, since identifying splice sites is a bottleneck in finding genes, improvements in this area can contribute to revealing genomic information. The proposed algorithms have the potential for wider application: predicting anti-sense gene therapies, RNA interference, retro-transposon recognition, RNA regulation of gene expression, and systematic errors in gene chip microarrays. We propose to model and compute how binding small RNAs and proteins modulates gene expression, in particular mRNA splicing.

Project Terms:

Correlation Studies; Statistical Correlation; MicroRNAs; miRNA; Micro RNA; RNA Interference; Sequence-Specific Posttranscriptional Gene Silencing; RNAi; RNA Silencings; RNA Silencing; Quelling; Posttranscriptional Gene Silencings; Posttranscriptional Gene Silencing; Post-Transcriptional Gene Silencings; Post-Transcriptional Gene Silencing; RNA Binding; Binding (Molecular Function); Molecular Interaction; Binding; Small RNA; RNA Folding; Exons; Point Mutation; Spliceosomes; Gene Expression; Gene Expression Regulation; Gene Regulation Process; Gene Regulation; Gene Action Regulation; gene therapy; genetic therapy; gene-based therapy; Genetic Intervention; Gene Transfer; Transfer Procedure; Gene Transfer; Clinical Gene Therapy; Natural RNAi; RNA Therapy; Gene-directed enzyme substrate; Universal Hexanucleotide Therapeutics;
# Project Information

**Project Number:** 3R1GM080690-01S1  
**Title:** BINDING AND SPlicing MRNA

**Contact PI / Project Leader Information:**
- **Name:** AALBERTS, DANIEL PAUL  
- **Email:** [Click to view Contact PI / Project Leader email address](#)

**Program Official Information:**
- **Name:** Unavailable

**Other PI Information:**
- **Not Applicable**

**Organization:**
- **Name:** WILLIAMS COLLEGE  
- **City:** WILLIAMSTOWN  
- **Country:** UNITED STATES

**Department/ Educational Institution Type:**
- **Unavailable**

**Congressional District:**
- **State Code:** MA  
- **District:** 01

**Other Information:**
- **FOA:**
- **Study Section:**
- **Fiscal Year:** 2009  
- **Award Notice Date:** 18-SEP-2009

**Agency:**
- NATIONAL INSTITUTES OF HEALTH

**Project Funding Information for 2009:**
- **Total Funding:** $79,200
### Results

#### Project Information

Project Number: 3R15GM080690-01S1  
Title: BINDING AND SPlicing MRNA  
Contact PI / Project Leader: AALBERTS, DANIEL PAUL  
Awardee Organization: WILLIAMS COLLEGE

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**ABOUT STAR METRICS RESULTS**

Publications: Publications missing? Principal Investigators [click here](#)  
Click on the column header to sort the results

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<table>
<thead>
<tr>
<th>Title (Link to full-text in PubMed Central)</th>
<th>Journal (Link to PubMed abstract)</th>
<th>Authors</th>
<th>Similar Publications By</th>
<th>Cited Publications By</th>
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<tr>
<td>Free energy cost of stretching mRNA hairpin loops inhibits small RNA binding.</td>
<td>Biophysical Journal, 2013 Jan 22; 104 (2): 482-7</td>
<td>Meng, Yuzhong; Aalberts, Daniel P</td>
<td><img src="#" alt="PubMed" /> <img src="#" alt="PubMed Central" /> <img src="#" alt="Google Scholar" /></td>
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<td>A two-length-scale polymer theory for RNA loop free energies and helix stacking.</td>
<td>RNA (New York, N.Y.), 2010 Jul; 16 (7): 1350-5</td>
<td>Aalberts, Daniel P; Nandagopal, Nagarajan</td>
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**Patents:**
### Similar Projects

**Project Information**

3R15GM080090-01S1

**Contact PI / Project Leader:** AALBERTS, DANIEL PAUL  
**Awardee Organization:** WILLIAMS COLLEGE

#### 100 projects similar to 3R15GM080090-01S1 (100 maximum)
Click on the column header to sort the results

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<td>TAYLOR, PALMER WILLIAM</td>
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<td>ORGANIZATION AND FUNCTION OF TRANSCRIPT CONTROL ELEMENTS AT THE HUMAN FRAGILE X</td>
<td>TAPSCOTT, STEPHEN J.</td>
<td>UNIVERSITY OF WASHINGTON</td>
<td>2008</td>
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<td>NIH</td>
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Incorporate user feedback
Update with FY 2013 data + USDA
Release to the public (search tool and data)
Add links to SciENcv profiles
Incorporate research results
  - Publications
  - Patents
  - RPPR products
  - SciENcv data
• Finalized design concepts for the STAR METRICS website redesign

• Development of a responsive website
Redesigning Website

• Simple yet modern, clean and organized
• Updated content (in progress)
• Responsive and adaptive to all type of devices using different screen resolutions.
• The user-interface of the institutional pages is re-aligned for easy access to the quarterly reports and data requests.
About Star Metrics

Welcome to the STAR METRICS project. This STAR METRICS project guide will provide an overview of the STAR METRICS project and outline how research institutions can get involved with this project. This guide is complemented by further documentation on the STAR METRICS website that outlines the technical specifications for the project and provides guidance to research institutions wishing to participate in STAR METRICS.

STAR METRICS Overview

STAR METRICS is a federal and research institution collaboration to create a repository of data and tools that will be useful to assess the impact of federal R&D investments. The National Institutes of Health (NIH) and the National Science Foundation (NSF), under the auspices of Office of Science and Technology Policy (OSTP), are leading this project. This project has been developed after a successful pilot project was conducted with several research institutions in the Federal Demonstration Partnership (FDP). The STAR METRICS project consists of two implementation levels:

- **Level I**
  - Developing uniform, auditable and standardized measures of the impact of science spending (ARRA and non-ARRA) on job creation, using data from research institutions' existing database records. No personally identifiable information (PII) is collected in Level I.

- **Level II**
  - Developing measures of the impact of federal science investment on scientific knowledge (using metrics such as publications and citations), social outcomes (e.g., health outcomes and measures and environmental impact factors), workforce outcomes (e.g., student mobility and employment), and economic growth (e.g., patenting, new company start-ups and other measures). Data elements that will be collected in Level II will be collectively determined in consultation with institutions that have joined Level I.
Acknowledgments

- STAR METRICS Executive Committee
- STAR METRICS Interagency Working Group
- NIH DATA Systems
- FDP