

Finding the Machine [processes]: Applying the Open Data Project to Research Services

Charleston Conference 2015
(Session with Kamran Naim and Robin Champieux)

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pinboard.in tag

pinboard.in/u:jasonclark/t:open-machines/

twitter as channel (#hashtag)

@jaclark #chs15

Open has Consequences

Almost always good ones...

Overview

- Why Open?
- “Open” and Research Signals
- Machine Processes + Tools
- Questions

What do you mean by “open”?

- An open work must satisfy requirements around open licenses, open access, and open formats.

It can be summed up in the statement that:

"Open means anyone can freely access, use, modify, and share for any purpose (subject, at most, to requirements that preserve provenance and openness)."

Put most succinctly:

"Open data and content can be freely used, modified, and shared by anyone for any purpose"

[Read the full Open Definition »](#)

<http://opendefinition.org/od/>

“A piece of data or content is open if anyone is free to use, reuse, and redistribute it - subject only, at most, to the requirement to attribute and/or share-alike.”

<http://opendefinition.org/>

Open Data + Research Signals?

Part of a Library Continuum

Machine Harvesting

HTML

Application: Web Harvesting of PubMed

www.lib.montana.edu/~jason/files/crawler/
www.lib.montana.edu/~jason/files/crawler/index.txt

Given web page, return article titles
and article URLs

Web Crawler

Research Signals

<https://www.ncbi.nlm.nih.gov/pubmed/26539112>

Crawl

Key: [Home](#) [What?](#) [Code](#) [Credit](#) [@jaclark](#)



Abstract ▾

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Front Aging Neurosci. 2015 Oct 20;7:204. doi: 10.3389/fnagi.2015.00204. eCollection 2015.

PGC-1α Silencing Compounds the Perturbation of Mitochondrial Function Caused by Mutant SOD1 in Skeletal Muscle of ALS Mouse Model.

Qi Y¹, Yin X¹, Wang S¹, Jiang H¹, Wang X¹, Ren M², Su XP³, Lei S³, Feng H¹.

Author information

Abstract

Amyotrophic lateral sclerosis (ALS) is a lethal neurodegenerative disease causing death of motor neurons. This study investigated the roles of energy metabolism in the pathogenesis of ALS in the SOD1(G93A) transgenic mouse model. Control and SOD1(G93A) mice were administered with shcontrol or shPGC-1α in combination with PBS or thiazolidinedione (TZD) for 8 weeks. Gene expression was analyzed by quantitative real-time PCR and Western blot. ROS and fibrosis were assessed with a colorimetric kit and Sirius staining, respectively. Inflammatory cytokines were measured using ELISA kits. The levels of tissue ROS and serum inflammatory cytokines were significantly higher in SOD1(G93A) mice compared to control mice, and knocking down peroxisome proliferator-activated receptor gamma coactivator 1-alpha (PGC-1α) drastically increased cytokine levels in both control and SOD1(G93A) mice. Muscle fibrosis was much severer in SOD1(G93A) mice, and worsened by silencing PGC-1α and attenuated by TZD. The expression levels of PGC-1α, SOD1, UCP2, and cytochrome C were substantially reduced by shPGC-1α and increased by TZD in muscle of both control and SOD1(G93A) mice, whereas the level of NF-κB was significantly elevated in SOD1(G93A) mice, which was further increased by PGC-1α silencing. These data indicated that disruption of energy homeostasis would exacerbate the pathological changes caused by SOD1 mutations to promote the pathogenesis of ALS.

KEYWORDS: ALS; PGC-1α; SOD1(G93A); energy metabolism; fibrosis; inflammation

PMID: 26539112 [PubMed]



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Disruption of skeletal muscle mitochondrial network genes and mitochondrial function [Neurobiol Dis. 2013]

Decreased mRNA expression of PGC-1α and PGC-1β in skeletal muscle of ALS mice [J Neuropathol Exp Neurol. 2012]

PGC-1α protects neurons and alters disease progression in ALS [Muscle Nerve. 2011]

Review Altered expression of atypical PKC and Ryk in the skeletal muscle of ALS mice [Dev Neurobiol. 2014]

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lateral sclerosis (29770)

Web Crawler

Research Signals

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PubChem Substance

/pcsubstance

All Chemicals & Bioassays Resources...

/guide/chemicals-bioassays/

DNA & RNA

#dna-rna

BLAST (Basic Local Alignment Search Tool)

<http://blast.ncbi.nlm.nih.gov/Blast.cgi>

Linked Data Assignments

Linked Pages + Resources

Application: GetSemantic

www.lib.montana.edu/~jason/files/getsemantic/
github.com/jasonclark/getsemantic

Given a linked resource, return
linked data entities + keywords

getSEMantic [beta]

jason a. clark

Get Analysis



Key: [Demo App](#) [What is this?](#) [View Code](#) [@jaclark](#) [Credit](#)

getSEMantic [beta]

jason a. clark

Mmmmm... Semantic Yumminess

Ranked Entities

Engineering

relevance: 0.944351

concepts & linked data resources:

- <http://dbpedia.org/resource/Engineering>
- <http://rdf.freebase.com/ns/m.02ky346>

Social sciences

relevance: 0.795123

concepts & linked data resources:

- http://dbpedia.org/resource/Social_sciences
- http://sw.opencyc.org/concept/Mx4rwauQZNc8Qdibm_jCfd9X4g



getSEMantic [beta]

jason a. clark

Mmmmm... Semantic Yumminess

Ranked Keywords

Research Databases

relevance: 0.919159

State University Library

relevance: 0.911417

MSU Library Accessibility

relevance: 0.840938

Policy Mobile Site

relevance: 0.81602

Open access journal

relevance: 0.810361



Understanding the Sharing Economy

API

Application: Watching Reuse in Social Networks

www.lib.montana.edu/~jason/files/social-signal/
www.lib.montana.edu/~jason/files/social-signal/index.txt



Can Tweets Predict Citations? Metrics of Social Impact Based on Twitter and Correlation with Traditional Metrics of Scientific Impact

Gunther Eysenbach^{1,2,3}, MD, MPH, FACMI

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J Med Internet Res 2011;13(4):e123

DOI: [10.2196/jmir.2012](https://doi.org/10.2196/jmir.2012)

PMID: [22173204](https://pubmed.ncbi.nlm.nih.gov/22173204/)

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Demonstrating Library Value at Network Scale: Leveraging the Semantic Web With New Knowledge Work

<http://dx.doi.org/10.1080/01930826.2014.946778>

journal: Journal of Library Administration

doi: 10.1080/01930826.2014.946778

open access?:

facebook:

twitter: 15

readers (mendeley, citeulike, connotea): 11



Complete details from Altmetrics.com

Filtering Research

API

Application: MSU Research Citations

arc.lib.montana.edu/msu-research-citations/
github.com/msulibrary/msu-research-citations

Leila Sterman - People at MSU Library



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Multivalent scaffolds induce galectin-3 aggregation into nanoparticles

Authors: Goodman, Candace K, Mark L Wofenden, Pratima Nangia-Makker, Anna K. Michel, Avraham Raz, and Mary J. Cloninger

Ethnic Identity, Drinking Motives, and Alcohol Consequences Among Alaska Native and Non-Native College Students

Authors: Skewes, Monica C., and Arthur W. Blume
Date: December 2014

Individual mineral supplement intake by ewes swath grazing or confinement fed pea-barley forage

Authors: Ragen, Devon L., Erin E. Nix, Rachel L. Endecott, Patrick G. Hatfield, Mark K. Petersen, and Janice G. P.



Latest Montana State University Research Citations

ScienceDirect Search: Montana State University

Title: Solar image parameter data from the SDO: Long-term curation and data mining

Author:

Published Date: Fri, 30 Oct 2015 09:18:56 -0700

Content Snippet: Publication date: Available online 29 October 2015 Source:Astronomy and Computing Author(s): M.A. Schuh, R.A. Angryk, ...

Content: Publication date: Available online 29 October 2015

Source:Astronomy and Computing

Author(s): M.A. Schuh, R.A. Angryk, P.C. Martens

The Solar Dynamics Observatory (SDO) mission captures thousands of images of the Sun per day, motivating the need for efficient and effective storage, representation, and search over a massive repository of data. This work investigates the general-purpose image parameter data produced by the SDO Feature Finding Team's trainable module, which operates at a fixed six minute cadence over all AIA channels. The data contains ten numerical measures computed for each image cell over a 64 x 64 grid for each image. We analyze all available data and metadata produced over the first three years and present comprehensive statistics and outliers while validating the cleanliness and usability of the data source for future research. We then utilize a database of automated solar event reports to create large-scale region-labeled datasets available to the public. We highlight the new-found potential for data-driven discovery by presenting several best-case labeling scenarios that establish a baseline for comparing machine learning classification and attribute (image parameter) evaluation results. Future work focuses on continued dataset curation and spatiotemporal data mining.

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Open, Networked Research Signals



New Research Services

Questions?

twitter.com/jaclark

www.lib.montana.edu/~jason/talks.php

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