THE ALS RESEARCH FORUM
Discovering a Common Goal, Discovering a Cure
PRIZE4LIFE ALS ASSOCIATION

ALS Research Forum e-Newsletter Vol. 164 **December 2, 2016**

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Public Invitation to the Open Forum of ALS Assistive Technologies

Prize4Life and The ALS association invite all members of the ALS community, including researchers, clinical professionals, patients and caregivers, to attend the ALS Assistive Technology Challenge open forum event on December 5, 2016, at the International Alliance of MND Associations Meeting in Dublin, Ireland, to test prototypes of assistive technology and provide feedback for the final stage of the Challenge.

Event details and location can be found here.

Research News

DPRs Spread Between Cells, but Pathogenic Significance Remains Unclear
Spread of misfolded proteins in neurodegenerative diseases has been a growing theme in recent years, with evidence accumulating that alpha-synuclein, tau, amyloid-beta, huntingtin, SOD1, and TDP-43 can move between cells and induce templated misfolding in the receiving cell (see Dec 2012 news, Jun 2013 news, Jan 2016 news). A paper published in the Oct 11 Cell Reports now adds another culprit to the list - dipeptide repeat proteins (DPRs) translated from the expanded hexanucleotide repeats of C9ORF72. DPR transmission was detected in vitro between primary mouse neurons and astrocytes, as well as between ALS patient iPSC-derived neurons. Further studies are needed to determine how these results translate to the disease process in mice and humans.

Diverse Strains of Misfolded Tau Could Explain Differences in Tauopathies
Tauopathies are diverse neurodegenerative conditions caused by misfolding and aggregation of the tau protein. But how do tau abnormalities cause such varied diseases as frontotemporal dementia and chronic traumatic encephalopathy? A paper in the November 23 Neuron, adds to the evidence suggesting that different strains of the protein cause different pathologies in a prion-like fashion (see May 2014 news). In cell lines, the researchers characterized 18 different tau strains based on their morphological properties and rates of seeding aggregation. They next analyzed tau distribution and pathology following injection of each strain in the brain of transgenic mice expressing mutant tau. Strikingly, the regional distribution and rates of spreading were unique for each tau strain, suggesting that each strain shapes a different disease.

Muscle-derived FGFBP1 Helps Preserve NMJ Integrity, but Fails in ALS

Transforming growth factor beta (TGF-β1) released by astrocytes has been implicated in mediating motor neuron death in ALS (see Apr 2015 news). Now, it is resurfacing as an agent of destruction through another avenue: it contributes to neuromuscular junction (NMJ) abnormalities in ALS. According to a paper in the November 14 Journal of Neuroscience, muscle fibers secrete fibroblast growth factor binding protein 1 (FGFBP1) and concentrate it at the NMJs, but in aging and in SOD1-ALS models, its expression declines. What causes the change in FGFBP1 expression? The researchers honed in on TGF-β1, which accumulates at the neuromuscular synapse during aging and in SOD1-ALS mice and inhibits FGFBP1 expression. These studies point to a potential therapeutically-relevant pathway to protect NMJ integrity in ALS.

Assistive Technology News

Fully Implanted Brain Computer Interface Helps ALS Patient Speak

A brain-computer interface (BCI) communication system has allowed a paralyzed woman with ALS to independently type on a screen by using "mind-control". The fully implanted BCI technology, described in the November 12 New England Journal of Medicine online, is composed of subdural electrodes implanted over the motor cortex and a wireless transmitter. To spell words, the patient selects letters on a screen by imagining movement of her paralyzed hand, which triggers signals that are detected by the electrodes. The typing rate achieved was much slower than similar BCI systems that require supervision of a research technician, but it provides significantly more independence. It also contains a backup system of electrodes in the prefrontal cortex that can be used if motor cortical degeneration due to ALS precludes use of the original electrodes.

Finalists for the ALS Assistive Technology Challenge Announced

Five finalists have been selected for the ALS Assistive Technology Challenge, a competition for the development of innovative technologies that enable people with ALS to communicate with ease, thus improving their quality of life. The finalists include a team developing an auto-positioning system for eye gaze-controlled speech devices, an application that facilitates voice message banking, a brain-computer interface (BCI) with increased speed and reliability, a communication system for people with little to no movement ability, and a sophisticated speech generation device. The winner of the $400,000 award, sponsored by The ALS Association and Prize4Life, will be selected at the International Symposium on ALS/MND.

Drug News

MJFF Announces Winners of PPMI Data Challenge

The Michael J. Fox Foundation for Parkinson's Research (MJFF) has announced two winners of its Parkinson's Progression Markers Initiative (PPMI) Data Challenge. The challenge sought to attract Parkinson's disease (PD) researchers and data scientists to analyze the longitudinal biomarker data from the PPMI, in order to identify predictors of disease progression and develop models to stratify PD patients. The winning teams, hailing from University of California, San Francisco, and Weill Cornell Medicine in New York, each won $25,000. Similar crowdsourcing competitions have been awarded by Prize4Life in the ALS field for identifying progression markers and patient subgroups based on the ALS clinical trial database, PRO-ACT (see Nov 2012 news, Nov 2015 news). These MJFF challenges further demonstrate the power of big data crowdsourcing challenges to leverage expertise of scientists from diverse fields

to advance neurodegenerative disease research.

Funding Opportunities:

We have updated all the NIH funding opportunities applicable to ALS research. Check out the full list of funding opportunities.

December 2016

MDA Investigator-Initiated Research Grants. Letter of Intent due Dec 15, 2016.

MDA Young Investigator Development Grants. Letter of Intent due Dec 15, 2016.

TARGET ALS New Collaborative Projects. Letter of Intent due by December 15, 2016.

January 2016

NINDS Exploratory Clinical Trials for Small Business. Application due by January 5, 2017.

CIRM Funding Opportunity: DISC1: The Inception Awards. Application due by Jan 20, 2017.

Full List of Funding Opportunities >>

Job Opportunities:

Postdoctoral Position, University of Central Florida. Orlando, FL.

Assistant Professor, Barrow Neurological Institute. Phoenix, AZ.

Postdoctoral Position. RIC Sensory Motor Performance Program, RIC, Chicago, IL.

Postdoctoral Position - Fenghua Hu Lab. Cornell University, Ithaca, NY.

Biostatistician, Research Fellow, University of Dublin, Ireland.

Full List of Job Opportunities >>

Upcoming Meetings:

March 2017

Mar 29-Apr 2, 2017: Vienna, Austria:International Conference on Alzheimer's and Parkinson's Diseases.

April 2017

Apr 22-28, 2017: Boston, MA. American Academy of Neurology Annual Meeting. **Abstracts due October 24, 2016.**

July 2017

July 23-28, 2017: Stowe, VT: Gordon Research Conference on ALS and Related Motor Neuron Diseases. Applications due June 25, 2017.

Full List of Upcoming Meetings>>

Resources:

ALS Drugs in Development Database

ALSGene

Alzforum ALS Mouse Model Database

The PRO-ACT Database

NEALS Biofluid Repository Available to Researchers

VABBB ALS CNS Tissue Request Information Site

Target ALS Core Facilities

Download the Working with ALS Mice Manual Here

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