News, Literature, and Events in Braingenethics

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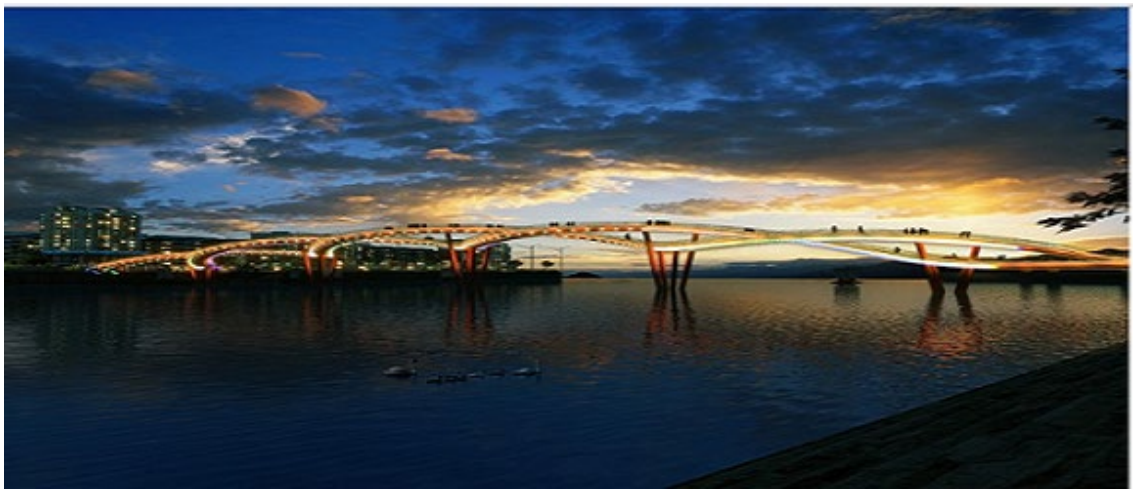

The next Braingenethics Update (Vol. 3, No. 10) will appear in January 2017.

In the Literature

[The Forensic Use of Behavioral Genetics in Criminal Proceedings: Case of the MAOA-L Genotype]

Sally McSwiggan et al.

A low activity genotype of monoamine oxidase (MAOA-L) could be linked to a higher risk of aggressive and antisocial behavior. The study identified criminal cases citing a MAOA-L genotype as evidence to excuse or mitigate behavior. The genetic evidence was admissible in some courts during the guilt, sentencing, and post-conviction appeal stages. In some of these, the case concluded with a lesser sentence. It is difficult to gauge the

Precision Medicine in Context

[Genetic Testing Fumbles, Revealing "Dark Side" of Precision Medicine]

Sharon Begley

Researchers at the Mayo Clinic report that while enthusiasm for precision medicine remains high, errors, including genetic misdiagnosis and overtreatment, continue to cause problems.

[The Promise and Peril of Precision Medicine: Phenotyping Still Matters Most]

effect of both MAOA-L and other allelic variants on individual behavior, and the introduction of the evidence on the outcome of the case.

Psychological, Behavioral, and Social Effects of Disclosing Alzheimer's Disease Biomarkers to Research Participants: A Systematic Review

Sonja Bemelmans et al.

This literature review investigated the psychological, behavioral, and social effects of disclosing Alzheimer's disease (AD) biomarker results (in particular, an APOE genotype) to cognitively healthy participants. It concluded that the disclosure of an APOE ε4-positivity genotype result does not lead to elevated anxiety or depression in individuals with a first-degree relative with AD, but could increase test-related distress and impact decision-making concerning insurance and health.

Towards a More Representative Morphology: Clinical and Ethical Considerations for Including Diverse Populations in Diagnostic Genetic Atlases

Maya Koretzky et al.

Textbooks of dysmorphology used by healthcare professionals to diagnose genetic syndromes lack diversity in phenotypic images and do not allow geneticists to diagnose conditions in individuals of different ancestral backgrounds easily. This paper addresses the importance and ethical concerns of projects combatting the lack of images from diverse populations.

Exploring Boundaries for the Genetic Consequences of Assortative Mating for Psychiatric Traits

Wouter J. Peyrot

Partners tend to be characterized by similar psychiatric traits, which can result in accumulated genetic risk in offspring. This study tried to quantify this

Jaeger P. Ackerman et al.

After erroneously identifying a variant as causing long QT syndrome in the living brother of a deceased patient, Mayo Clinic researchers work to identify the deceased's actual cause of death. They note that while genetic testing offers great promise, it is important to not overinterpret genetic results, especially in the presence of phenotypic ones.

Patient Safety in Genomic Medicine: An Exploratory Study

Diane M. Korngiebel

Genetic testing poses concerns for patient safety due to errors and the limitations of current tests. As genomic tests are integrated into medical care, anticipating and addressing patient safety concerns identified by these patients will be crucial.

Ethical, Legal, and Social Implications of Personalized Genomic Medicine Research: Current Literature and Suggestions for the Future

Shawneequa L. Callier et al.

A literature review outlines strengths of current ELSI scholarship and ways that it can better serve the increasingly global, interdisciplinary, and diverse personalized genomic medicine research community.

accumulated risk, which has been long assumed, and finds that consequences may be most pronounced for rare disorders with high heritability.

In the Media

[A Gene that Could Help Explain Why Lithium Stabilizes Mood]

Joseph Frankel

A new study provides insight into the success of lithium as a treatment for bipolar disorder. Lithium successfully mitigated behavioral abnormalities that occurred in mice missing a gene involved with the development of neuron growth and connectivity. Lithium stimulated the development of new neuronal connections, accommodating for the genomic deficit and moderating behavior.

See original study here.

[Can Mental Illness Be Prevented In The Womb?]

Bret Stetka

Studies have found that infants whose mothers took B vitamin choline supplements while pregnant were less likely to exhibit abnormal inhibitions to sound stimuli, which is sometimes correlated with attention and social problems and schizophrenia. Studies suggest that prenatal choline is essential for the development and activation of

In the Literature, cont.

[RGS2 Expression Predicts Amyloid-β Sensitivity, MCI and Alzheimer's Disease: Genome-Wide Transcriptomic Profiling and Bioinformatics Data Mining]

Adva Hadar et al.

Brain deposits of amyloid-β plaques have been considered a pathological hallmark of Alzheimer's disease (AD), but have also been found in healthy brains. Through genome-wide transcriptomic profiling, this study identified varied expression of the RGS2 gene between healthy individuals and AD patients. It is thought that RGS2 could affect whether Aβ accumulation results in the development of AD. RGS2 is a novel AD biomarker.

Read news article here

[The Unique Evolutionary Signature of Genes Associated with Autism Spectrum Disorder]

Erez Tsur et al.

Autism spectrum disorder (ASD) genes are, on average, longer and less variable than non-ASD genes especially in the case of deleterious genetic variations, an indication of negative selection. ASD genes have evolved under complex and unique evolutionary forces, and the signature of such forces could be used to identify new candidate ASD genes.

CHRNA7 receptors, decreased levels of which are thought to contribute to schizophrenia.

[How Genetics Could Help Future Learners Unlock Hidden Potential]
Darya Gaysina
Educational genomics is a relatively new field, but it is thought that it could one day enable the creation of tailor-made curriculum programs based on a pupil's DNA profile.

[Americans Blame Obesity on Willpower, Despite Evidence It's Genetic]
Gina Kolata
Although scientific research shows that diet and exercise are insufficient solutions, a large majority of Americans say fat people should be able to summon the willpower to lose weight on their own.

[It's Not All in the Genes: Clean Living Can Cut Heart Risks]
Marilynn Marchione
A large study finds that people with the most inherited risk cut their chances of having a heart attack or other heart problems in half if they didn't smoke, ate well, exercised, and stayed slim.

[Geneticists Should Offer Data to Participants]
Sarah Nelson
A genetics researcher asked for access to her genomic data in exchange for her participation in a research project, and was refused. She concludes that the genetics research community needs to develop an anticipatory infrastructure to return raw data to interested participants.

[A Bivariate Genetic Analysis of Drug]

[An Ultraconserved Brain-Specific Enhancer Within ADGRL3 (LPHN3) Underpins Attention-Deficit/Hyperactivity Disorder Susceptibility]
Ariel Martinez et al.
The authors look at noncoding elements within the gene ADGRL3, which is thought to be linked to ADHD. They find the first functional evidence of noncoding variants with potential implications for the pathology of ADHD.

[Association of a Genetic Risk Score with Body Mass Index Across Different Birth Cohorts]
Stefan Walter et al.
Do genetic predispositions to higher body mass index (BMI) have different impacts for people in obesogenic environments? This study finds that the magnitude of association between BMI and genetic risk score for BMI was larger between people born more recently, suggesting that associations between genetic variants for higher BMIs may be modified by obesogenic environments.
Read responses to this piece [here], [here] and [here].

[Cytoplasmic FMR1-Interacting Protein 2 is a Major Genetic Factor Underlying Binge Eating]
Stacey Kirkpatrick et al.
Binge eating is a highly heritable trait, and is often comorbid with mood and substance use disorders. This study identifies a major genetic factor underlying binge eating, which offers a behavioral paradigm for future genome wide association studies and has implications for the disorders comorbid with binge eating.

[Behavioral and Molecular Genetics of Reading-Related AM and FM Detection Thresholds]
Matthew Bruni et al.
This is the first behavioral and molecular

[Abuse Ascertained Through Medical and Criminal Registries in Swedish Twins, Siblings, and Half-Siblings]

Hermine Maes et al.

Using data from the Swedish nationwide registry, this study found substantial heritability and moderate contributions of shared environmental factors to drug abuse. In addition, genetic and shared environmental risk factors for drug abuse were highly correlated.

[Genetic Associations Between Personality Traits and Lifetime Reproductive Success in Humans]

Venla Berg et al.

This study looked at associations between lifetime reproductive success and genotypic and phenotypic characterizations of two personality traits: neuroticism and extraversion. This work will help to predict responses to population selection more accurately.

[Contribution of Copy Number Variants to Schizophrenia from a Genome-Wide Study of 41,321 Subjects]

CNV and Schizophrenia Working Groups of the Psychiatric Genomics Consortium

This genome-wide study investigated the contribution of copy number variants (CNV) to schizophrenia (SCZ) in a uniquely large study cohort. The study found significant evidence for enrichment of CNV burden in cases at eight loci, and suggestive support for eight additional loci. The significant genes are primarily associated with synaptic function and neurobehavioral phenotypes.

genetic characterization of two auditory traits that are associated with reading in both typically developing and dyslexic readers. It found that one of those traits is genetically correlated with reading, while the other is not.

[Chromosome Conformation Elucidates Regulatory Relationships in Developing Human Brain]

Hyejung Won et al.

Gene expression is regulated, in part, by three-dimensional physical interactions within chromosomes. This work provides a framework for understanding these regulatory interactions within noncoding genetic regions.

[Mutational Signatures Associated With Tobacco Smoking in Human Cancer]

Ludmil B. Alexandrov et al.

Smoking is associated with mutations that increase the risk of at least 17 classes of human cancer. Data from this study support the hypothesis that smoking increases cancer risk by increasing the somatic mutation load, although direct evidence for this mechanism is lacking in some smoking-related cancer types.

[Researchers Grow “Frankenstein Ants” to Study Epigenetics]

Jeffrey M. Perkel

A molecular biologist ventures into entomology to use genetically modified ants as laboratory models of behavioral epigenetics.

Upcoming Opportunities

[December Seminar on Ethical, Legal and Social Implications of Genetics]

Monday, December 19th, 2016, 12:00 pm, Sergievsky Center Room PH19-201, Columbia University Medical Center

|MC:SUBJECT|

This month's speaker is Dr. Mario Mendez, a behavioral neurologist in the Ronald Reagan UCLA Medical Center Department of Neurology. Dr. Mendez's talk is titled "The Implications of Frontotemporal Degeneration for the Social Brain, Sociopathy, Morality and Semantics."

2017 Genomics and Society: Expanding the ELSI Universe (The 4th ELSI Congress)

June 5, 2017, The Jackson Laboratory for Genomic Medicine and UConn Health, Farmington, CT

This is the latest in a series of major conferences for ELSI researchers and others interested in the ethical, legal, and social implications of genomic research. **Abstract Submissions due December 1st.**

Call for Proposals: Special Initiative on Integrating Biology and Social Science Knowledge

Letters of inquiry regarding projects that align with the Russell Sage Foundation's program areas in Social Inequality, Behavioral Economics, Future of Work, and Race, Ethnicity and Immigration are **due by Monday January 9, 2017.**

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