ISGC Newsletter
Issue 22 - April 2013

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If you'd like to suggest a topic or article for a future newsletter, or if you'd like to give general feedback, please contact:

Valerie Valant (valant@chgr,mgh.harvard.edu).

Introduction

This is the twenty-second issue of the bi-monthly newsletter for the International Stroke Genetics Consortium. The ISGC newsletter will serve to keep investigators updated on ongoing projects, new project proposals, meetings, and publications.

The newsletter will be posted as a PDF document to the ISGC website on the 1st of even months (or nearest workday) and can either be viewed online or downloaded as an attachment.

All Investigators are invited and encouraged to submit content for the newsletter. Please send content suggestions to Valerie Valant (valant@chgr.mgh.harvard.edu).

ISGC Founding Principles

Cerebrovascular disease is a complex disorder influenced by variation in many genetic and non-genetic exposures, each of which contributes only a small influence to disease risk. Therefore large (larger than any single center can assemble on its own) well-characterized samples will be necessary to discover these exposures.

Principles of Collaboration:

1) The ISGC is open to all who can contribute
2) All contributions will be fairly recognized in publications
3) We work together in a spirit of cooperation and open communication in order to promote the best science in the present and the best science in the future.

ISGC Project Updates

New Projects:

A Joint meta-analysis of gene x aspirin interactions in ischemic stroke to identify variants related to aspirin resistance

Contact: Christopher John Oldmeadow and John Attia

Date Proposed: February 2013

Aims: Discovery study to confirm loci involved in gene x aspirin interaction in stroke patients . We performed a genome-wide gene x environment-interaction study on a predominantly elderly European cohort of stroke cases with self-reported medication history and found evidence of a locus on chromosome 7p32 (3 SNPs). We propose to meta-analyse this region (consisting of 4 SNPs) using summary statistics from participating groups using the Joint Meta Analysis (JMA) method (described in Manning et al, Genetic Epidemiology 2011).

Status: Seeking ISGC Collaborators

Genetics on post stroke functional outcome: Genome wide association study (GWAS) on post ischemic stroke functional outcome

Contact: Jane Maguire, Arne Lindgren, Christina Jern and Brad Worrall

Date Proposed: February 2013

Aims: (A) To conduct a GWAS to identify genetic variants associated with functional outcome after ischemic stroke; (B) To replicate the preliminary GWAS results from the discovery cohort

Status: GWAs of Discovery cohort in progress. Primary result expect ed end of 2013. Grant submitted to Australian funding body for replication cohort.

Genetics on post stroke functional outcome: Candidate gene study of post stroke functional outcome including replication

Contact: Arne Lindgren, Christina Jern, Brad Worrall and Jane Maguire,

Date Proposed: February 2013

Aims: (A) To conduct a candidate gene replication study of 3 SNPs associated with post stroke functional outcome; 1 SNP in the GPIIIa gene known for its prothrombotic function and 2 SNPs in the COX-2 gene known for its function in the inflammatory pathway; (B) To conduct a candidate gene replication study of 2 SNPs associated with post stroke functional outcome in a gene known to have a protective effect against oxidative stress; (C) To examine if a candidate gene in the SDF-1/CXCR4/7 pathway is related to post stroke functional outcome; (D) We will also consider examining whether the ApoE epsilon 4 polymorphism is related to poor outcome in a large group of ischemic stroke patients.

Status: In Progress

ISGC Project Updates

New Projects (continued):

The ISGC: Establishment of a biorepository for stroke genetic research

Contact: Valerie Valant, Thomas Battey and Jonathan Rosand

Date Proposed: February 2013

Aims: To describe how one academic health center and an international consortium of researchers collaborated to organize and implement a stroke genetic research bio-repository. This paper will not only provide details on how to set-up a research biorespository, but will also help under-represented countries & continents to contribute their cohorts to stroke genetic research. (There will be a separate paper by Jenny Majersik and Jane Maguire on ISGC phenotyping protocols and standards).

Status: In Progress

Ongoing Projets:

NIH-funded ICH GWAS

Contact: Jonathan Rosand

Date Proposed: January 2008

Aims: This multi-center genome-wide association study (GWAS) is designed to identify genetic determinants of:

1) Risk of intracerebral hemorrhage (ICH) using a case-control design

2)Clinical course of ICH using a cohort design of individuals who have suffered an ICH.

Status: MGH (GOCHA and ISGC), University of Cincinnati (GERFHS), and University of Pennsylvania (Pakistani ICH Study) have imputed their data to the latest release of 1000 genomes (1000 genomes phase I integrated variant set) using IMPUTE2 and run GWA in their respective case-control subject pool. We are currently exchanging summary results and performing a meta-analysis across all 3 studies.

Looking for genetic risk factors of cervical artery dissections

Contact: Stéphanie Debette and Didier Leys, on behalf of the CADISP group

Date Proposed: February 2009

Aims: A replication study to test whether the polymorphisms associated with CAD in the GWAS within the CADISP-consortium are also associated with CAD in other independent populations, in order to exclude spurious associations.

Status: The CADISP manuscript is in the revision process.

ISGC Project Updates

Ongoing Projects (continued):

The International Stroke Genetics Consortium Informatics Platform: A tool for Efficient Collaboration and Rapid Discovery

Contacts: Steve Bevan, Jonathan Rosand

Date Proposed: February 2009

Aims: 1) Compile a publically-available web-based catalog of all clinical characteristics, radiographic studies, genetic data and available biological samples collected for subjects with ischemic stroke and controls.

2) Enrich characterization of stroke patients by classifying all subjects according to the biologically-based Causative Classification of Stroke System and creating a central repository of de-identified neuroimaging data on patients with stroke.

Status: Imaging repository function will be a part of the NINDS-ISGC collaborative U01 grant. Phenotypic and genotypic functionality to be added as a part of a BioInformatics Research Network ARRA grant.

National Institute of Neurological Disorders and Stroke Ischemic Stroke GWAS

Contacts: Steven Kittner

Date Proposed: March 2009

Aims: Funding of an ischemic stroke genetics consortium in order to perform a genome wide association study in ischemic stroke patients and matched controls.

Status: Grant awarded. Project underway.

White Matter Hyperintensity GWAS

Contacts: Natalia Rost, Jonathan Rosand

Date Proposed: July 2009

Aims: To discover genetic markers of WMH severity using available genome-wide data and WMH volumes measured on MRI in patients with acute ischemic stroke.

Status: (1) Replicated the 17q25 locus and WMH severity in stroke patients (accepted to Stroke); (2) MGH and WTCCC have imputed their data to the latest release of 1000 genomes (1000 genomes phase I integrated variant set) using IMPUTE2 and run GWA in their respective cohorts; (3) MGH and WTCCC have exchanged GWA summary results and performed meta-analysis across all studies. Future plans include GWAS of approximately 700 additional subjects to be included in the analysis; (4) Genetic Risk Score validation proposal for WMH in incident ischemic stroke (initially developed in collaboration with Framingham Study) has been submitted to METASTROKE; 4) Preliminary WMH heritability analyses have been completed and pending validation.

ISGC Project Updates

Ongoing Projects (continued):

MetaStroke: A meta-analysis of genome-wide studies in ischaemic stroke

Contact: Hugh Markus

Date Proposed: December 2009

Aims: Meta-Analysis of genome-wide data in ischemic stroke

Status: Meta-analysis underway. Additional project proposal for replication cohorts sent out to ISGC in September.

Genome-wide association study of deep cerebral phenotypes

Contact: Dan Woo

Date Proposed: February 2010

Aims: (1) Specific SNPs/gene regions will be associated with deep cerebral phenotypes (deep/periventricular location of ICH, lacunar stroke or white matter disease) and this association will be independent of traditional risk factors including hypertension. (2) Specific SNPs/gene regions will be associated with deep cerebral phenotypes and will be modified by the presence/duration/severity of hypertension.

Status: List of interested studies compiled and in the process of developing a data transfer agreement. In addition, we are awaiting the completion of the Wellcome Trust effort as it would constitute a major contribution of small vessel ischemic strokes.

Genetics of cerebral venous thrombosis (CVT)

Contact: Pankaj Sharma

Date Proposed: May 2010

Aims: To recruit DNA from CVT patients in order to undertake a GWAS.

Status: Samples have now been received by Imperial College and are in the process of being extracted prior to genotyping.

Replication of associations detected in a the Meta-stroke meta-analysis of genome-wide studies in ischaemic stroke

Contact: Hugh Markus

Date Proposed: September 2010

Aims: Replication of findings from the initial MetaStroke collaboration in novel cohorts of Caucasian and other ethnic groups.

Status: Analysis in progress

ISGC Project Updates

Ongoing Projects (continued):

Consortium of Minority Population genomewide-Association Studies of Stroke (COMPASS)

Contact: Brad Worrall

Date Proposed: December 2010

Aims: Meta-analysis of cohorts and case-control studies with GWAS data for individuals of African descent and other minority groups.

Status: No update at this time.

Replication of Ischemic Stroke Genes Discovered from Exome Sequencing

Contact: Steve Rich

Date Proposed: March 2011

Aims: Replication of genes discovered in NHLBI Exome Sequencing Project in ischemic stroke cases with small or large vessel strokes.

Status: The examination of rare variants in ischemic stroke in collaboration with the NHLBI Exome Sequencing Project (ESP) has made significant progress. The ESP Executive Committee has approved the use of 3,000 case samples and 3,000 control samples to be genotyped with the ExomeChip, a custom 300,000 SNP array (as designed by Illumina) with rare variants residing in exomes and additional content. These samples will be split with WHI and the ISGC, and restricted to those samples with existing GWAS data (for imputation), deep phenotyping (for use with other targeted traits), and both cases and controls from the same sites, with IRB approval for extensive sharing of information and deposition of data into dbGaP. The two studies that had samples meeting these criteria and immediately available for shipment to the University of Washington (the ESP genotyping site for ischemic stroke) were GEOS and ISGS. These samples are being sent for evaluation with anticipated completion of genotyping in Q1 2012.

Genetic studies of recurrent stroke

Contact: Brad Worrall, Michele Sale, Keith Keene

Date Proposed: February 2011

Aims: Meta-analysis and replication of GWAS in recurrent ischemic stroke.

Status: No update at this time.

ISGC Project Updates

Ongoing Projects (continued):

Next Generation Sequencing in Lacunar Stroke and Small Vessel Disease

Contact: Anna Bersano

Date Proposed: April 2011

Aims: Perform Next-Generation Sequencing on subjects with lacunar stroke and small vessel disease. Novel mutations will be replicated via direct genotyping in an additional 1000 cases and 1000 controls .

Status: No update at this time.

GWA meta-analysis of carotid plaque and intima-media thickness (IMT)

Contact: Pankaj Sharma

Date Proposed: June 2011

Aims: Meta-analysis of existing GWA data in those subjects who have had carotid imaging in order to use carotid disease as a surrogate for vascular disease.

Status: Individual Investigators are being approached to determine the extent of phenotyping available.

Genome-wide Heritability of Ischemic Stroke in Caucasians.

Contact: Braxton Mitchell

Date Proposed: August 2011

Aims: Examine the heritability of ischemic stroke using genome wide SNPs for early vs. late onset IS and determining stroke subtype

Status: No update at this time.

GWAS of Stroke/TIA in Patients with Atrial Fibrillation

Contact: Mina Chung, Sudha Seshadri

Date Proposed: October 2011

Aims: Perform a GWAS meta-analysis of stroke/TIA within AF cases

Status: No update at this time.

Genome Wide Association Study of Plasma Fibrinogen

Contact: Christopher O'Donnell

Date Proposed: November 2011

Aims: To conduct a meta-analysis of GWA studies on plasma levels of fibrinogen with the goal of identifying novel loci that underlie variation in plasma fibrinogen concentration.

Status: No update at this time.

ISGC Project Updates

Ongoing Projects (continued):

Pharmacogenomics GWAS of tPA-induced Haemorrhagic Transformation

Contact: Christopher Levi and Jane Maguire

Date Proposed: November 2011

Aims: To identify SNPs associated with haemorrhagic transformation of acute ischemic stroke after intravenous tPA therapy using a pharmacogenomic-focused GWAS.

Status: Although unfunded, we are currently recruiting from two Australian sites, and collaborating with ISGC groups for future pooling of further samples

Genome-wide association study of incident stroke-wave 2

Contact: Stéphanie Debette, Will Longstreth, and Sudha Seshadri on behalf of the CHARGE Consortium

Date Proposed: June 2012

Aims: Our aim is to perform a second wave Incident Stroke GWAS meta-analysis within the CHARGE consortium, including a larger number of cohorts, using 1000G imputation, and including extension to other ethnic groups if large enough samples can be collected.

Status: AGES has ascertained stroke events in their large Icelandic sample, has MRI and will be part of upcoming CHARGE stroke analyses.

GRECAS Project: Genotyping Risk and Efficacy of Clopidogrel or Aspirin following Stroke

Contact: Israel Fernandez-Cadenas and Joan Montaner

Date Proposed: September 2012

Aims: Replication Study. This is a pharmacogenomic study, the main objective is: to find genetic risk factors associated with Aspirin or Clopidogrel clinical resistance, considering clinical resistance as new vascular recurrences during a follow up of one year.

Status: No update at this time, recruitment of replication cohort ongoing.

ISGC Project Updates

Ongoing Projects (continued):

International Stroke Genetics Consortium Project Protocols and Standards

Contact: Jennifer Majerisk and Jane Maguire

Date Proposed: January 2013

Aims: The goal of this paper is to describe clinical and research criteria agreed upon by the ISGC to standardize data collection of stroke cases & controls across continents. Criteria will include definitions and requirements for harmonization of phenotypes, neuroimaging, genotyping definitions and requirements, and ethics. (There will be a separate paper by Valerie Valant and others on how to biobank.) It is anticipated that in addition to providing ISGC members with agreed clinical and research parameters, this paper will aid and encourage investigators in under-represented countries & continents to contribute their cohorts to stroke genetic research.

Status: No status at this time.

Completed Projects:

Wellcome Trust Case Control Consortium Ischemic Stroke GWAS

Contact: Hugh Markus

Date Proposed: July 2007

Aims: Determine whether there are genetic determinants of ischemic stroke that can be identified using GWAS and whether these determinants predispose individuals to specific subtypes of stroke.

Status: Manuscript published.

*Bellenguez C, Bevan S, Gschwendtnew A, et al., on behalf of the International Stroke Genetics Consortium (ISGC) & the Wellcome Trust Case Control Consortium 2 (WTCCC2). Genome-wide association study identifies a variant in HDAC9 associated with large vessel ischemic stroke. *Nature Genetics.* 2012;44(3):328-333.

ISGC Project Updates

Completed Projects (continued):

A genome-wide association study of early onset ischemic stroke

Contact: Braxton Mitchell, Steven Kittner

Date Proposed: January 2008

Aims: To carry out a GWAS of early onset stroke

1) Conduct a staged GWAS in the U of Maryland sample
2) Replicate associations detected in Aim 1 in an independent set of young-onset stroke cases controls from collaborators in the ISGC.
3) Determine if SNPs robustly associated with early onset stroke in both the Maryland and IGSC cohorts are also associated with older onset stroke.

Status: Manuscript in press at G3: Genes, Genomes, Genetics

*Cheng Y-C, O'Connell JR, Cole, JW, Stine OC, Dueker N, McArdle PF, Sparks MJ, Shen J, Laurie CC, Nelson S, Doheny KF, Ling H, Pugh EW, Bott TG, Brown Jr. RD, Meschia JF, Nalls M, Rich SS, Worrall B, Andreson CD, Biffi A, Cortellini L, Furie KL, Rost NS, Rosand J, Manolio TA, Kittner SJ, Mitchell BD. Genome-wide association analysis of ischemic stroke in young adults. *G3: Genes, Genomes, Genetics*. 2011 Nov 1; 1(6):505-514.

International Validation of a Computerized Algorithm for Etiologic Classification of Ischemic Stroke: The Causative Classification of Stroke System (CCS)

Contact: Hakan Ay, Jonathan Rosand

Date Proposed: March 2008

Aims: This is an ISGC-wide study to validate a computerized system for etiologic classification of ischemic stroke.

Status: Manuscript published.

*Arsava EM, Ballabio E, Benner T et. al.; on behalf of the International Stroke Genetics Consortium. The Causative Classification of Stroke system: An international reliability and optimization study. *Neurology*. 2010 Oct 5;75(14):1277-1284.

Replication of Chr. 9q21region in stroke cases and matched controls in Chinese population

Contacts: Xingyu Wang, Lisheng Liu

Date Proposed: March 2008

Aims: To replicate the findings of the Chromosome 9p21 projects of the ISGC within a Chinese cohort.

Status: The project has been stalled due to a lack of sample collection.

ISGC Project Updates

Completed Projects (continued):

Australian GWAs in ischaemic stroke

Contact: Christopher Levi, John Attia, Jane Maguire and Liz Holliday

Date Proposed: May 2008

Aims: To identify snps associated with acute ischaemic stroke

Status: We demonstrated that the most common mechanistic form of ischaemic stroke, large artery atherosclerosis (LAA) is influenced by a genetic component. We identified a new LAA susceptibility locus on chromosome 6p21.1. We then replicated this susceptibility locus in 1,715 LAA cases and 52,695 population controls from 10 independent population cohorts. We are currently participating in discovery and replication cohorts with various ISGC members. Manuscript published.

Holliday EG, Maguire JM, Evans TJ, et al, on behalf of the International Stroke Genetics Consortium. Common variants at 6p21.1 are associated with large artery atherosclerotic stroke. *Nat Genet.* 2012;44(10):1147-51.

Relationship of genetic markers for common risk factors for stroke with ischemic cerebrovascular disease

Contact: Vincent Thijs

Date Proposed: June 2008

Aims: Determine whether SNPs associated with well known risk factors for ischemic stroke like diabetes, elevated LDL, myocardial infarction and atrial fibrillation are associated with ischemic cerebrovascular disease using a case control design.

Status: Manuscript published.

*Lemmens R, Buysschaert I, Geelen V, et.al. International Stroke Genetics Consortium. The Association of the 4q25 Susceptibility Variant for Atrial Fibrillation With Stroke Is Limited to Stroke of Cardioembolic Etiology. *Stroke.* 2010;41(9):1850-7.

ISGC Project Updates

Completed Projects (continued):

Chromosome 12 and risk of ischemic stroke: A replication study

Contacts: James Meschia, Andrew Singleton, Jonathan Rosand

Date Proposed: April 2009

Aims: Replication effort through the ISGC of the CHARGE discovery of two SNPs on chromosome 12 that were over-represented among cases with ischemic stroke, compared to controls.

Status: Manuscript published.

*International Stroke Genetics Consortium; Wellcome Trust Case-Control Consortium 2. Failure to validate association between 12p13 variants and ischemic stroke. *New England Journal of Medicine*. 2010;362(16):1547-1550.

Are established candidate gene polymorphisms for blood pressure, coronary heart disease, atrial fibrillation, lipid metabolism and hemostatic and inflammatory pathways also related to ischemic stroke risk in populations from the Southwest of Sweden?

Contacts: Arne Lindgren, Christina Jern, Olle Melander

Date Proposed: July 2009

Aims: To examine if SNPs related to phenotypes are related to ischemic stroke risk in a homogenous population sample from the Southwest of Sweden.

Status: Manuscript published.

*Olsson S, Melander O, Jood K, Smith JG, Lövkvist H, Sjögren M, Engström G, Norrving B, Lindgren A, Jern C, the International Stroke Genetics Consortium (ISGC). A genetic variant on chromosome 12p13 does not show association to ischemic stroke in three Swedish case-control studies. *Stroke.* 2010; 42(1):214-6.

ISGC Project Updates

Completed Projects (continued):

Genes and Response to Aspirin in Secondary Stroke Prevention, GRASSP

Contact: Agnieszka Slowik, Joanna Pera

Date Proposed: June 2010

Aims: To establish genetic markers of aspirin efficiency, aspirin resistance, aspirin intolerance, and increased risk aspirin-related adverse effects in ischemic stroke patients with different stroke etiologies. To develop clinically useful and cost-effective test(s) allowing predict responses to aspirin treatment, and to avoid/ reduce adverse effects .

Status: Grant submitted, project not funded at this time.

Association of myocardial infarction-associated SNPs with ischemic stroke: a meta-analysis of European Caucasian populations

Contact: Braxton Mitchell, Yu-Ching Cheng

Date Proposed: July 2010

Aims: The goal of this project is to extend previous work (e.g., the ISGC analysis of the chr 9 SNP on stroke) to determine if: (1) other MI-associated SNPs are associated with ischemic stroke; and (2) if associations of these additional SNPs are dependent on stroke subtype and/or age of stroke onset.

Status: Manuscript published.

Cheng YC, Anderson CD, Bione S, et al, on behalf of the International Stroke Genetics Consortium. Are myocardial infarction—-associated single-nucleotide polymorphisms associated with ischemic stroke? *Stroke*. 2012;43(4):980-986.

Other Projects Involving ISGC Members

Genetic and Environmental Risk Factors for Hemorrhagic Stroke
Contact: Daniel Woo

Australian Stroke Genetics Collaborative Group
Contact: Chris Levi, John Attia

NHLBI Initiative on White Matter Disease
Contact: Paul Nyquist

INTERSTROKE
Contact: Guillaume Pare

Mitochondrial Genetics and Risk of Stroke
Contact: Jonathan Rosand
Status: Manuscript published

METASTROKE
Contact: Martin Dichgans

ISGC Grants Awarded

- Wellcome Trust Genome-Wide Association Study for Ischemic Stroke (WTCCC2)
- Australian Stroke Genetics Collaborative Group
- The Baltimore-Washington Young Stroke Study (GEI)
- Gene Discovery for Warfarin-Related Intracerebral Hemorrhage (ICH GWAS)
- Ethnic/Racial Variations of Intracerebral Hemorrhage (ERICH)
- NINDS-Stroke Genetics Network (SiGN) Study

ISGC Publications (2009-2011)

2009:

Gschwendtner A, Bevan S, Cole JW, et. al.; on behalf of the International Stroke Genetics Consortium. Sequence variants on chromosome 9p21.3 confer risk for atherosclerotic stroke. *Ann Neurol.* 2009;65(5):531-9.

2010:

International Stroke Genetics Consortium; Wellcome Trust Case-Control Consortium 2. Failure to validate association between 12p13 variants and ischemic stroke. *N Engl J Med.* 2010;362 (16):1547-50.

Lemmens R, Buysschaert I, Geelen V, et. al.; on behalf of the International Stroke Genetics Consortium. The association of the 4q25 susceptibility variant for atrial fibrillation with stroke is limited to stroke of cardioembolic etiology. *Stroke.* 2010;41(9):1850-7.

Arsava EM, Ballabio E, Benner T, et. al.; on behalf of the International Stroke Genetics Consortium. The Causative Classification of Stroke system: An international reliability and optimization study. *Neurology.* 2010; 75(14):1277-1284.

Biffi A, Sonni A, Anderson CD, et al.; on behalf of the International Stroke Genetics Consortium. Variants at APOE Influence Risk of Deep and Lobar Intracerebral Hemorrhage. *Ann Neurol.* 2010; 68(6):934-43.

2011:

Anderson CD, Biffi A, Rahman R, et. al, on behalf of the International Stroke Genetics Consortium. Common mitochondrial sequence variants in ischemic stroke. *Ann Neurol.* 2011; 69(3):471-80.

Olsson S, Melander O, Jood K, Smith JG, Lövkvist H, Sjögren M, Engström G, Norrving B, Lindgren A, Jern C, the International Stroke Genetics Consortium (ISGC). A genetic variant on chromosome 12p13 does not show association to ischemic stroke in three Swedish case-control studies. *Stroke.* 2011; 42(1):214-6.

Biffi A, Anderson CD, Jagiella JM, et.al., on behalf of the International Stroke Genetics Consortium. APOE genotype and extent of bleeding and outcome in lobar intracerebral haemorrhage: a genetic association study. *Lancet Neurology.* 2011;10(8):702-709.

ISGC Publications (2012-Present)

2012:

International Stroke Genetics Consortium (ISGC); Wellcome Trust Case Control Consortium 2 (WTCCC2), Bellenguez C, et al. Genome-wide association study identifies a variant in HDAC9 associated with large vessel ischemic stroke. *Nature Genetics.* 2012;44(3):328-333.

Cheng YC, Anderson CD, Bione S, et al, on behalf of the International Stroke Genetics Consortium. Are myocardial infarction—-associated single-nucleotide polymorphisms associated with ischemic stroke? *Stroke.* 2012;43(4):980-986.

Falcone GJ, Biffi A, Devan WJ, et al, on behalf of the International Stroke Genetics Consortium. Burden of Risk Alleles for Hypertension Increases Risk of Intracerebral Hemorrhage. *Stroke.* 2012;43(11):2877-2883.

Holliday EG, Maguire JM, Evans TJ, et al, on behalf of the International Stroke Genetics Consortium. Common variants at 6p21.1 are associated with large artery atherosclerotic stroke. *Nat Genet.* 2012;44(10):1147-51.

Traylor M, Farrall M, Holliday EG, et al, on behalf of the International Stroke Genetics Consortium. Genetic risk factors for ischaemic stroke and its subtypes (the METASTROKE Collaboration): a meta-analysis of genome-wide association studies. *Lancet Neurol.* 2012;11 (11):951-962.

2013:

Williams FM, Carter AM, Hysi PG, et al, on behalf of the International Stroke Genetics Consortium. Ischemic stroke is associated with the ABO locus: The EuroCLOT study. *Ann Neurol.* 2013;73(1):16-31.

Anderson CD, Biffi A, Nalls MA, et al, on behalf of the International Stroke Genetics Consortium. Common variants within oxidative phosphorylation genes influence risk of ischemic stroke and intracerebral hemorrhage. *Stroke.* 2013;44(3):612-9.

Falcone GJ, Biffi A, Devan WJ, et al, on behalf on the GOCHA investigators. Burden of Blood Pressure-Related Alleles is Associated with Larger Hematoma Volume and Worse Outcome in Intracerebral Hemorrhage. *Stroke.* 2013. In press.

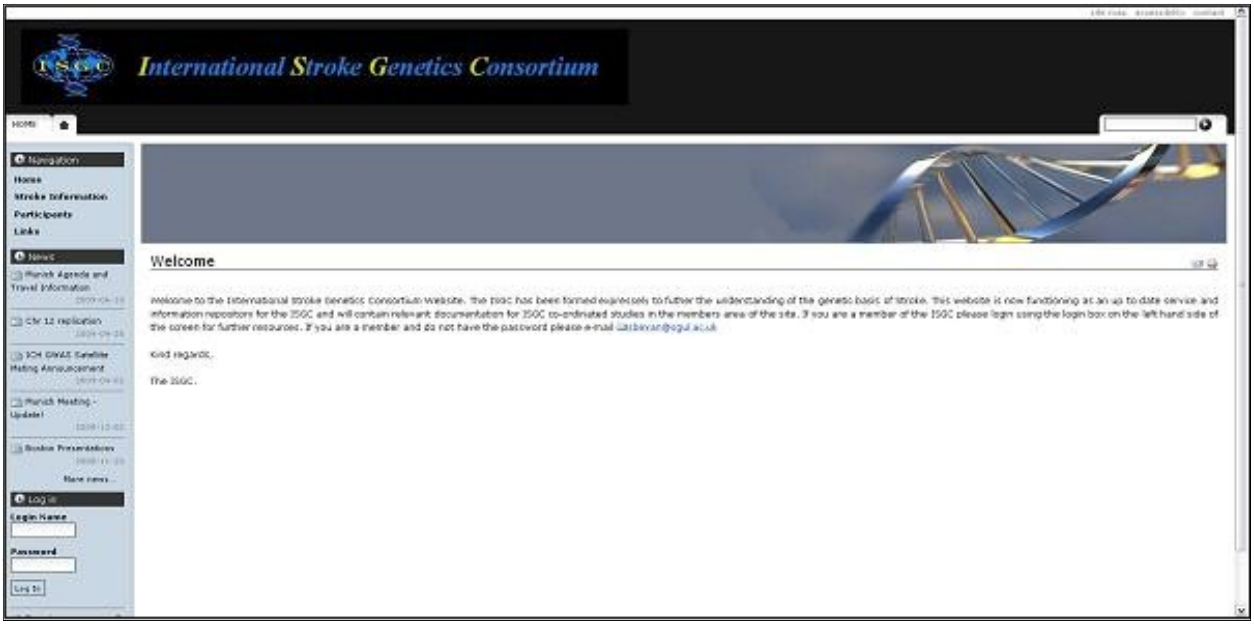
Devan WJ, Falcone GJ, Anderson CD, on behalf of the International Stroke Genetics Consortium. Heritability Estimates Identify a Substantial Genetic Contribution to Risk and Outcome of Intracerebral Hemorrhage. *Stroke.* 2013. In press.

Website Update

The ISGC website can be found at www.strokegenetics.org. Please consider submitting a short bio and a picture for the website! If you are interested, please email them to Steve.

If you have additional website content or layout suggestions, please email Steve Bevan (sbevan@sgul.ac.uk) with your ideas.

Thank you!



Upcoming Conference Deadlines

2013

International Stroke Genetics Consortium Meeting

Meeting Date: April 25-26, 2013
Meeting Location: Charlottesville, VA

European Stroke Conference

Abstract Deadline: N/a
Meeting Date: May 21-31, 2013
Meeting Location: London, United Kingdom

American Neurological Association

Abstract Deadline: March 31, 2013
Meeting Date: October 13-15, 2013
Meeting Location: New Orleans, LA

American Society of Human Genetics

Abstract Deadline: June 4, 2013
Meeting Date: October 22-26, 2013
Meeting Location: Boston, MA

2014

International Stroke Conference

Abstract Deadline: TBA
Meeting Date: February 12-14, 2014
Meeting Location: San Diego, CA

American Academy of Neurology

Abstract Deadline: TBA
Meeting Date: April 26 - May 3, 2014
Meeting Location: Philadelphia, PA

13th International Workshop: Charlottesville, Virginia (USA)

The 13th International Workshop of the ISGC will take place on April 25-26, 2013 in Charlottesville, Virginia (USA), and will be hosted by Brad Worrall (BBW9R@hscmail.mcc.virginia.edu) and Christina Jern (Christina.Jern@neuro.gu.se).

Registration is now open! Please refer to the event website for registration information as well as more detailed information regarding event programs and travel arrangements.

Event Website: http://www.medicine.virginia.edu/ISGC