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NEWS AND COMMENTARY

Psychiatric genetics in China

Psychiatric genetics in China: achievements and challenges

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To coordinate research efforts in psychiatric genetics in China, a group of Chinese and foreign investigators have established an annual 'Summit on Chinese Psychiatric Genetics' to present their latest research and discuss the current state and future directions of this field. To date, two summits have been held, the first in Changsha in April 2014, and the second in Kunming in April 2015. The consensus of roundtable discussions held at these meetings is that psychiatric genetics in China is in need of new policies to promote collaborations aimed at creating a framework for genetic research appropriate for the Chinese population: relying solely on Caucasian population-based studies may result in missed opportunities to diagnose and treat psychiatric disorders. In addition, participants agree on the importance of promoting collaborations and data sharing in areas where China has especially strong resources, such as advanced facilities for nonhuman primate studies and traditional Chinese medicine: areas that may also provide overseas investigators with unique research opportunities. In this paper, we present an overview of the current state of psychiatric genetics research in China, with emphasis on genome-level studies, and describe challenges and opportunities for future advances, particularly at the dawn of 'precision medicine'. Together, we call on administrative bodies, funding agencies, the research community and the public at large for increased support for research on the genetic basis of psychiatric disorders in the Chinese population. In our opinion, increased public awareness and effective collaborative research hold the keys to the future of psychiatric genetics in China.

THE CHANGSHA SUMMIT AND PSYCHIATRIC GENETICS IN CHINA TODAY

The last decade has witnessed a rapid rise in psychiatric genetic research conducted in China and other countries in East Asia. Many researchers from these regions have also been collaborating with leading groups in Europe and America during this period. To assess the current state of psychiatric genetics in China and explore possibilities for increasing domestic and international collaborations, researchers convened in Changsha, Hunan Province, on 2nd and 3rd April 2014 for the First Summit on Chinese Psychiatric Genetics. The meeting was hosted by the State Key Laboratory of Medical Genetics and Mental Health Institute of the Second Xiangya Hospital, both affiliated with Central South University. Participants included principal investigators from funded psychiatric genetics laboratories in Changsha, Beijing, Shanghai, Kunming, Chengdu, Hong Kong and Taipei, as well as several researchers from the United States and Germany.

The Summit was organized under the auspices of the Global Diversity Task Force of the International Society of Psychiatric Genetics (www.ISPG.net). The Task Force Chair, Chunyu Liu (Changsha, Hunan, China and Chicago, IL, USA), and ISPG Secretary, Thomas G Schulze (Munich, Germany and Baltimore, MD, USA), invited the participants to present their current work and discuss how psychiatric research in China can be further improved. Seventeen speakers covered a wide range of topics, including candidate genes involved in psychiatric disorders, schizophrenia genome-wide association studies, lithium pharmacogenetics, clinical and molecular endophenotypes, mitochondrial contributions to disorders, impact of human evolutionary history on psychiatric disorders, and novel statistical and bioinformatics methods. Together, these presentations covered many major achievements and topics of current interest in the field of psychiatric genetics in China.

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Table 1. GWAS and related replicate studies on Han Chinese populations

Diseases or traits	*Authors*	*Sample sizes*	*Types of studies*
Heroin dependence	Glatt *et al.*[33]	1513 Individuals; 397 sibling pairs	Genome-wide linkage
Bipolar disorder (BPD)	Lee *et al.*[1]	Discovery: 1000 type I BPD patients and 1000 controls; replication: 409 type I BPD cases and 1000 controls	GWAS
BPD, schizophrenia (SCZ) and major depressive disorder (MDD)	Zeng *et al.*[34]	1139 Unrelated BPD cases (645 type I BPD); 1122 unrelated SCZ cases; 1122 unrelated MDD cases and 1138 controls	Meta-analysis and replication of a GWAS signal at gene DGKH
Fluid intelligence in schizophrenia	Ma *et al.*[35]	98 Schizophrenia cases and 60 controls	GWAS
Schizophrenia	Yue *et al.*[13]	GWAS: 746 schizophrenia cases and 1599 controls; replication: 4027 schizophrenia cases and 5603 controls	GWAS
Schizophrenia	Shi *et al.*[14]	Discovery: 3750 schizophrenia cases and 6468 controls; replication: 4383 cases and 4539 controls	GWAS
Autism spectrum disorder (ASD)	Zhou *et al.*[36]	361 Trios and 44 sporadic ASD children	Replication of a GWAS signal at gene MET
Treatment refractory schizophrenia	Liou *et al.*[37]	795 Treatment refractory schizophrenia cases and 806 controls	GWAS
Schizophrenia	Ma *et al.*[15]	976 Unrelated schizophrenia cases and 1043 controls,	Replication of nine GWAS signals
Schizophrenia	Li *et al.*[38]	10 Chinese and 2 Japanese samples; 8857 cases and 12 205 controls	Meta-analysis and replication of a GWAS signal at ZNF804A
Schizophrenia	Yuan *et al.*[39]	516 Schizophrenia cases, 400 controls, and 81 trios with early onset schizophrenia probands	Replication of a GWAS signal at ANK3
Schizophrenia	Yuan *et al.*[40]	1093 Schizophrenia cases and 1022 controls	Replication of a GWAS signal at TSPAN18
Schizophrenia	Li *et al.*[41]	8982 Cases and 12 342 controls	Meta-analysis and replication of a GWAS signal at ZNF804A
Schizophrenia	Li and Su[42]	12 477 Cases and 14 586 controls	Meta-analysis and replication of a GWAS signal at ZNF804A
Schizophrenia	Wong *et al.*[43]	498 Schizophrenia cases and 2025 controls, and a replication study on 1027 cases and 1005 controls	GWAS
Gray matter volume in schizophrenia	Wang *et al.*[44]	74 First-episode treatment-naïve patients with schizophrenia and 51 controls	GWAS
Brain structure	Li and Su[45]	Discovery: 299 individuals of Han Chinese; replication: 5775 individuals of European ancestry	GWAS signal functional study
Autism	Xia *et al.*[2]	Discovery: two Chinese cohorts, trios and case-control ($n = 2150$); replication: three data sets of European ancestry populations ($n = 12\,825$)	GWAS
Schizophrenia and MDD	He *et al.*[46]	1235 Cases with schizophrenia, 1045 with MDD and 1235 healthy controls	Replication of a GWAS signal at CACNA1C
Major depressive disorder	Li *et al.*[47]	1045 MDD cases and 1520 controls; 576 MDD cases and 576 controls	Replication of a GWAS signal at CDH7
Bipolar I disorder	Kuo *et al.*[48]	Discovery and replication: total 591 cases and 581 controls	GWAS
Bipolar disorder	Jan *et al.*[49]	775 Cases and 1541 controls	Replication of a GWAS signal at eight calcium channel genes
Alcohol dependence	Quillen *et al.*[50]	569 Probands from extended families	GWAS
ADHD	Yang *et al.*[51]	1040 Cases and 963 controls	GWAS
Drinking behavior	Yang *et al.*[52]	1420 Drinkers and 3590 nondrinkers in discovery, replication of 4896 drinkers and 13 293 nondrinkers	GWAS
Methamphetamine dependence	Uhl *et al.*[53]	580 Samples	GWAS

Abbreviations: ADHD, attention-deficit hyperactivity disorder; GWAS, genome-wide association studies.

As one of the world's largest ethnic populations, Han Chinese have been included in HapMap SNP mapping projects and 1000 Genomes projects for variant discovery. Compared with American and European populations, however, Han Chinese populations are significantly under represented in genome-wide association studies (GWAS). Since 2008, only 13 GWAS related to psychiatric disorders or traits that included individuals of Chinese descent have been published. Listed in Table 1, these studies focused on schizophrenia, subtypes of schizophrenia, schizophrenia-related traits, bipolar disorder[1] or autism.[2] The largest of these studies included several thousand samples. By contrast, during the same period about 256 GWAS were published on psychiatric diseases or traits (including addiction, sleep and eating disorders, behavior and brain structure, connectivity, and treatment responses) outside of China, primarily in Europe and the United States (GWAS Catalog[3]). The largest international psychiatric genetics research consortium, the Psychiatric Genomics Consortium (PGC; http://www.med.unc.edu/pgc)[4] has analyzed $>150\,000$ cases and controls, primarily of European descent.[5] Other examples of successful international collaborations include the ENIGMA consortium (http://enigma.ini.usc.edu/)[6] the Consortium on Lithium Genetics (www.ConLiGen.org),[7] Consortium on the Genetics of Schizophrenia (COGS),[8] and Project among African-Americans to Explore Risks for Schizophrenia (PAARTNERS).[9]

SUCCESSFUL PSYCHIATRIC GENETICS REQUIRES LARGE COLLABORATIVE CONSORTIA AND DATA SHARING

The success of the PGC in identifying novel genetic variants and biological pathways that contribute to psychiatric disorders

clearly demonstrates the importance of large sample sizes for detecting disease associations for genetic variants of modest effect.[5,10–12] In addition, successful genetic studies require the careful ascertainment and characterization of cases and controls and the implementation of uniform genotyping methods and strict data quality control. It is difficult for a single research group, let alone a single researcher, to shoulder all of these tasks.

As may be expected, the small number of GWAS carried out by individual labs or small sets of labs in China have yielded few definitive results. For example, a study by Yue *et al.*[13] reported schizophrenia associations at 11p11.2 and the MHC region and a study by Shi *et al.*[14] reported schizophrenia associations at 8p12 and 1q24.2, but these findings were not replicated in an independent study.[15] The inability to replicate genetic associations is a common problem in genetic studies of complex diseases and is often caused by extensive genetic and/or phenotypic heterogeneity, or sample sizes with insufficient power to detect the associations. These obstacles can be overcome with more selective ascertainment, improved phenotyping, and larger numbers of cases and controls. Clearly more cooperation among research groups and increased funding to support collaborative research within China will be essential to achieve these goals. The first steps in this direction have been taken through a few between-lab collaborations such as those initiated by Hong Kong and Sichuan, Changsha and Shanghai, or Changsha and Kunming investigators. These activities have produced joint publications, including several listed in Table 1.

In addition to direct lab-to-lab collaborations, sharing data more broadly would be another effective way to boost productivity. Again, meta-analyses carried out by PGC and other groups have repeatedly demonstrated the power of combining data from multiple sources.[16,17] The United States National Institutes of Health (NIH) has established policies requiring data sharing in its funding agreements for big grants, and these have been influential toward changing the culture of the genetics research community. There is currently no similar culture or infrastructure to support data sharing in China. This problem has been discussed in the field, however, and there are now several initiatives to foster collaboration and data sharing, such as the Strategic Priority Research Program of Chinese Academy of Sciences.[18]

PSYCHIATRIC GENETICS IN CHINA NEEDS MORE FUNDING

In recent decades, the Chinese government has steadily increased investments in science and technology, but investments in basic research are still smaller in terms of the percentage of total research and development spending than in most developed countries, including Japan and South Korea.[19] The NIH alone funded 156 new studies involving psychiatric genetics in 2012 and 2013, primarily through the NIMH, NIDA and NIAAA (Supplementary Table 1). By contrast, 104 new studies involving psychiatric studies genetics were funded by the National Natural Science Foundation of China (NSFC) or the Ministry of Science and Technology during the same period (Supplementary Table 2). In addition, NIH grants are usually much larger than their Chinese counterparts, although RMB (renminbi)-USD (US dollars) comparisons are difficult to interpret due to many non-currency factors involved. (For example, personnel costs are much lower in China compared with the United States and faculty base salaries are usually not covered by research grants, but experimental costs are significantly higher compared with the United States or Europe.) Most Chinese grants are funded at the level of NIH R21 grants or lower. Only a dozen Chinese grants with monetary allotments comparable to NIH R01, P or U grants, were awarded for psychiatric genetic projects initiated between 2012 and 2013. The total monetary value of all NSFC and Ministry of Science and Technology grants (covering all 3–5 year funding periods) initiated during 2012–2013 is only about 16.75 million USD, whereas NIH spent 98.2 million USD on the listed psychiatric genetics studies between 2012 and 1 October 2014 alone.

Private foundations have been another important source of support for psychiatric genetic research in Western countries: the Stanley Foundation, the Broad Foundation, Autism Speaks, the Simons Foundation, the Brain Research Foundation and many others have been generous in funding psychiatric genetics research. By contrast, private sources of support for psychiatric genetics do not exist in China, making the funding gap between Western countries and China even larger.

Clearly, investments in basic research on psychiatric diseases are not proportional to the socioeconomic burden of these disorders in China. Apparently, elucidating the genetics of psychiatric diseases has not yet become a high priority goal for Chinese funding agencies. Within basic research, non-genetic neuroscience is in much better shape.[20]

HOPE FROM THE CHINESE VERSION OF THE BRAIN PROJECT AND PRECISION MEDICINE

The establishment of the BRAIN Initiative and Precision Medicine Initiative were recently announced by the United States president. The Chinese government has also been planning similar projects and Chinese Brain Project is currently on track. Whether psychiatric genetics will benefit from this initiative, remains to be seen. From a scientific point of view, genetics is essential to understanding the origins of brain structure and function and the causes of brain disorders. It is unlikely that we will be able to fully understand mental illness without an understanding of its genetic underpinnings.

ADMINISTRATIVE POLICIES ARE CRITICAL TO PROMOTE COLLABORATIVE RESEARCH

In addition to increasing monetary support for research on the genetics of psychiatric disorders, it is essential that funding and administrative agencies in China develop policies that promote collaborative research. As collaborative structures challenge traditional methods for evaluating the contributions of individual researchers, creative solutions are needed to guarantee that individuals and their academic institutions receive appropriate recognition. If such solutions are not in place, the success of large consortia, and thus the success of the field as a whole, will be jeopardized by the unwillingness of researchers to share data or expertise.

Unfortunately, structural impediments to collaboration are still in place in China, where researchers typically receive credit only for those publications on which they are listed as the first or communicating author and their respective institution and academic department also listed first. Determining how to properly share credit and assign a balanced weight to each contributor's contributions, regardless of the exact position of the contributor's name in the authors' list, are key elements of successful collaborations. The recent trend for journals to require authors to state their individual contributions to the research is a step in the right direction, but additional measures are needed to make sure that individuals are not penalized for participating in collaborative projects. Since the ultimate goal of research is to improve people's health and welfare, it is imperative that university administrations and government agencies work with the research community to eliminate disincentives currently embedded in policies governing the evaluation of research and allocation of funds.

CHALLENGES AND OPPORTUNITIES FOR PSYCHIATRIC GENETICS RESEARCH IN CHINA

Concerning directions for future research on psychiatric genetics, it is likely that success in elucidating the genetic basis of psychiatric disorders will hinge upon the: (i) ascertainment of large, carefully and deeply phenotyped sets of families, cases and controls for each disorder, (ii) use of advanced genome-level experimental techniques, including second- and third-generation DNA sequencing technologies and advanced methods for the analysis of all kinds of 'omics' data, and (iii) development of powerful statistical and bioinformatic tools to handle 'big data'. Many of the required experimental tools are currently in use by the United States and European researchers and can be rapidly adapted to analyze Chinese samples. If realized, these efforts will generate Han Chinese-specific maps of genetic, epigenetic and functional variation, including molecular quantitative trait loci (expression (e)QTL, methylation (m)QTL and so on), similar to those produced by the ENCODE,[21] GTEx[22] and, most recently, PsychENCODE projects primarily for Caucasian populations. Genome-level resources are rapidly becoming indispensable for genetic research and detailed information on the Chinese population would greatly facilitate the identification of liability and protective genetic variants that are common in or unique to the Chinese population. Creating these resources will be a crucial step toward developing personalized precision medicine in China.

Although China currently lags behind the United States and Europe in funding and volume of research in psychiatric genetics, much of the technical expertise and human resources needed to support cutting-edge research in this field are already in place. For example, DNA samples from some of the largest studies on Caucasian populations are now being genotyped or sequenced in Shenzhen or Hong Kong. In addition, several Chinese research groups are currently conducting small-scale exome- and whole genome-sequencing projects, including several exome-sequencing projects focusing on schizophrenia or autism. Individual laboratories have also established short- or long-term collaborations as a means to leverage expertise and resources, often with advance agreements to alternate principal authorships on papers published together. China also has exceptional strength and depth in the areas of statistics, bioinformatics and computer science owing to a highly competitive education system.

GWAS and next-generation sequencing-based studies of complex genetic disorders require very large numbers of samples (for example, >10K cases and controls) to achieve sufficient statistical power. In addition, precise and expanded phenotyping is needed to identify endophenotypes or disorder subtypes that may be more tractable to genetic analysis. Fortunately, clinical departments in academically affiliated hospitals in China are often willing to commit resources to the ascertainment and clinical evaluation of subjects for genetic studies to improve their national ranking. Refined phenotyping, including structural and functional brain imaging, is becoming increasingly important in psychiatric research. Imaging technologies are also now widely available in China and the costs are usually considerably lower compared to the United States and Europe. Recently, several brain imaging investigators have begun publishing papers in the field of mental health.[23,24] An overview of endophenotyping studies in China is given by Chan *et al.* (2010).[25]

To date, the genetics of only several psychiatric disorders, including schizophrenia, autism and bipolar disorder have been studied in China. Clearly, there is need to expand these studies to include additional mental illnesses, such as attention-deficit hyperactivity disorder (ADHD), major depression and drug addiction. Even for disorders that have been covered, the numbers of individuals recruited into genetic studies are disproportionately small compared with the sizes of patient populations in China. Public awareness of psychiatric disorders and research, education, and physicians' participation will be crucial to improve the current situation. Of particular importance is the need to increase access to mental health care for the large number of individuals in China with undiagnosed and/or untreated mental illness.[26,27] Including these individuals in research studies may help publicize their plight and thereby improve access to mental health services.

Historically, international collaboration has had a crucial role in the advancement of science. Strict regulations governing the export of biological samples from China, however, has created barriers for some international collaborations, although it does offer protection against unequal collaborations in which Chinese partners only serve as sample suppliers, with limited intellectual contributions and credit. Hopefully, with the development of psychiatric genetics in China, more mutually beneficial collaborations can be approved by the Chinese government. In such collaborations, investigators from underdeveloped regions in China should gain not only credit in publications, but most importantly acquire training, skills, knowledge and resources to support future studies. Chinese scientists should work with government administrators to update and revise regulations based on recent developments in the field. Whereas international collaborations including Chinese partners may require extra efforts to establish, they are nonetheless feasible, as advanced experiments can now be carried out professionally in China.

Studies of post-mortem human brains have significantly contributed to our understanding of the biology of psychiatric disorders, and it will continue to be important for acquiring and integrating genetic, genomic and epigenomic data relevant to these disorders. Collecting post-mortem brains has been a challenging task worldwide, even more so in China, where individuals and relatives are reluctant to donate body tissues for cultural reasons. Currently, there is a single source for post-mortem brain tissue in mainland China: the Chinese Brain Bank Center (CBBC, http://cbbc.scuec.edu.cn) in Wuhan, which was established in 2007 and receives limited support from government funding agencies. To date, CBBC has acquired and carefully preserved several hundred brains, primarily obtained through medical autopsies and following stringent consent procedures. The collection, however, still lacks brains from individuals with well-documented psychiatric disorders. Clearly, psychiatric genetics research in China would benefit from an expanded program for the acquisition of both normal and pathological samples, as well as from sharing samples and expertise from brain banks outside of China. Key to achieving this goal will be additional government funding and, importantly, expanded public education and outreach programs.

Another important approach to understanding the genetic basis of psychiatric disorders is through studies of divergent populations, since genetic drift and regional selection may produce population-specific differences in allele frequencies and linkage disequilibrium patterns for liability and protective genetic variants. For example, a recent study showed that *CREB1* carries risk alleles that are present at moderate frequencies in Europeans, but are generally absent in Africans and East Asians. The high frequencies of these alleles among Europeans may be the result of genetic 'hitchhiking' due to natural selection acting on a nearby gene in the European population.[28] Frequencies of disease-associated variants may thus vary significantly between Chinese and European populations. Genetic association studies that incorporate information concerning the evolutionary histories of genes and populations should enhance our understanding of the genetic heterogeneity commonly observed in psychiatric disorders.

In addition to untapped opportunities in human genetics, China also has rich resources for studies on nonhuman primates. China is currently the leading producer and major supplier of experimental primates for developed countries, including the United States, and researchers from China have established a number of primate

animal models for human brain diseases.[29] Leading primate research facilities in China include the Kunming Primate Research Center of Chinese Academy of Sciences, Kunming Institute of Zoology, which has received international recognition.[30,31] The Research Center is well equipped and capable of supporting cutting-edge genetic research.

Another area where China may have special advantages is in the exploration and testing of herbal treatments for psychiatric diseases, an approach that falls within scope of traditional Chinese medicine and has not been extensively studied in Western countries. The implementation of well-designed studies of drug efficacy and impact on biomarkers of diseases should help us better understand the potential of alternative treatments. Herein may be found many opportunities for discoveries that lie beyond well-trodden paths.[32]

Clearly, the study of psychiatric genetics in Chinese populations should not be the exclusive province of investigators working in mainland China. Indeed, many researchers from Hong Kong, Taiwan, Singapore, Europe and North America have actively participated in psychiatric genetic studies of Chinese populations during the past decade. To foster collaborations, there is a definite need for a large scientific society built on shared interests and trust among colleagues. Such a society would promote public awareness, collaborative research, training, and data sharing and establish standards for experimental design and academic performance.

SUMMARY

Psychiatric genetics is still in its early stages in China, but has great potential and a promising future. Many of the elements and resources required for the dynamic growth of this field are already in place. At the same time, there are many hurdles to overcome. Enhanced education to promote public awareness of the importance of genetic research, increased funding for individual labs and collaborative research, increased participation of clinicians in patient ascertainment and testing, and improved academic evaluation policies are all vital to fostering collaborative research and the formation of large consortia needed to create a science of genetics tailored to the needs of the Chinese population. We hope that collaborative efforts of the entire psychiatric genetics community, with active input from the researchers who are working on neuroscience biology, will lead to better ways of diagnosing, treating and preventing psychiatric diseases in China, thereby easing the burdens of individual sufferers and their families and the social and economic burdens of country as a whole.

The ideas discussed at the First Summit on Chinese Psychiatric Genetics in 2004 were further developed at the Second Summit on Chinese Psychiatric Genetics in Kunming, Yunnan (12–13 April) and presentations and discussions from both Summits contributed to the content of the present paper. The Third Summit on Chinese Psychiatric Genetics will be held in Wuxi, Jiangsu in 2016. We strongly believe that these Summits will become an important forum for psychiatric genetics research in China and will serve as a seed from which a new research society will grow. We welcome all interested researchers, both international and from China, to join us at our next meeting in Wuxi.

DISCLAIMER

The views and opinions expressed in this article do not necessarily represent those of the governments or government agencies where the authors conduct their research.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Supplementary Information accompanies the paper on the Molecular Psychiatry website (http://www.nature.com/mp)

Supplementary Table 1. Genetic and Epigenetic Grants Funded by the NIH with starting dates in 2012 or 2013; costs up to October 1, 2014.

T	Act	Project	Year	Sub #	Project Title	Contact PI/Project Leader	Organization	FY	Admin IC	Funding	FY Total Cost	Total spending up to October 1st, 2014, when query was performed
1	K02	DA032573	1		DELINEATING THE ROLE OF GENETIC INFLUENCES ON CANNABIS INVOLVEMENT	AGRAWAL, ARPANA	WASHINGTON UNIVERSITY	2012	NIDA	NIDA	$86,030	$287,774
1	R21	MH096200	01A1		TRANSLATING OCD GENE-ASSOCIATION STUDIES INTO MICE TO EXAMINE SLC1A1 FUNCTION	AHMARI, SUSANNE ELIZABETH et al.	NEW YORK STATE PSYCHIATRIC INSTITUTE	2012	NIMH	NIMH	$201,324	$419,343
1	R21	NS076958	01A1		DOPAMINERGIC EPIGENOMES FROM HUMAN BRAIN	AKBARIAN, SCHAHRAM et al.	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	2012	NINDS	NINDS	$262,875	$460,298*
1	R01	MH093740	01A1		1/5 - GENETICS OF TRANSCRIPTIONAL ENDOPHENOTYPES FOR SCHIZOPHRENIA	ALMASY, LAURA A.	TEXAS BIOMEDICAL RESEARCH INSTITUTE	2012	NIMH	NIMH	$405,171	$1,076,531
1	R21	MH100868	1		NEUROBIOLOGY OF AGGRESSION CO-MORBIDITY IN MOUSE MODEL OF IDIC15 AUTISM	ANDERSON, MATTHEW P	BETH ISRAEL DEACONESS MEDICAL CENTER	2013	NIMH	NIMH	$261,000	$478,500
1	R01	NS081916	1		NEUROBIOLOGICAL MECHANISM OF 15Q11-13 DUPLICATION AUTISM SPECTRUM DISORDER	ANDERSON, MATTHEW P	BETH ISRAEL DEACONESS MEDICAL CENTER	2012	NINDS	NINDS	$380,625	$1,124,747
1	F32	MH098532	01A1		REFINING A TAXONOMY FOR EXTERNALIZING PSYCHOPATHOLGY USING GENOMIC IMAGING	ANDERSON, NATHANIEL	LOVELACE BIOMEDICAL & ENVIRONMENTAL RES	2013	NIMH	NIMH	$51,914	$107,896

1	P50	MH090964	01A1	5340	NEUROBIOLOGY OF SUICIDE: CHILDHOOD ADVERSITY AND EPIGENETICS	ARANGO, VICTORIA	NEW YORK STATE PSYCHIATRIC INSTITUTE	2013	NIMH		$302,096	$4,076,235
1	R01	ES021733	1		MOLECULAR AND EPIGENETIC MITOCHONDRIOMICS OF AIR PARTICLES, LEAD AND COGNITION	BACCARELLI, ANDREA	HARVARD SCHOOL OF PUBLIC HEALTH	2012	NIEHS	NIEHS	$546,891	$1,784,132
1	U01	MH101723	1		3/5 INTERNATIONAL CONSORTIUM ON BRAIN AND BEHAVIOR IN 22Q11.2 DELETION SYNDROME	BASSETT, ANNE S.et al.	CENTRE FOR ADDICTION AND MENTAL HEALTH	2013	NIMH	NIMH	$212,557	$424,024
1	F31	AG044047	01A1		GENETICALLY INFORMED STUDY OF MARITAL FUNCTIONING AND DEPRESSION AT MIDLIFE	BEAM, CHRISTOPHE R	UNIVERSITY OF VIRGINIA	2013	NIA	NIA	$20,393	
1	K99	AA022385	1		COPING-ORIENTED DRINKING IN TRAUMA-EXPOSED YOUNG ADULTS: A GENETICALLY INFORMED	BERENZ, ERIN	VIRGINIA COMMONWEALTH UNIVERSITY	2013	NIAAA	NIAAA	$77,523	$150,626
1	R21	MH101065	1		RETROTRANSPOSONS IN SCHIZOPHRENIA	BERRETTINI, WADE H	UNIVERSITY OF PENNSYLVANIA	2013	NIMH	NIMH	$240,000	$440,000
1	K23	DA033302	1		DECONSTRUCTING THE SMOKING AND ADHD COMORBIDITY: A MULTILEVEL GENETIC APPROACH	BIDWELL, L. CINNAMON	BROWN UNIVERSITY	2012	NIDA	NIDA	$173,459	$521,925
1	R01	DA033646	1		TRANSGENERATIONAL EFFECTS OF DRUG-EXPOSURE: EPIGENETIC AND BEHAVIORAL IMPACT	BLENDY, JULIE ANNet al.	UNIVERSITY OF PENNSYLVANIA	2012	NIDA	NIDA	$456,821	$1,250,978

1	R21	AI098964	01A1		A GENETIC BASIS FOR STRESS-NEUROENDOCRINE-IMMUNE INTERACTIONS	BONNEAU, ROBERT H. et al.	PENNSYLVANIA STATE UNIVERSITY	2012	NIAID	NIAID	$242,809	$428,618
1	R01	MH093533	01A1		2/5-GENTICS OF TRANSCRIPTIONAL ENDOPHENOTYPES FOR SCHIZOPHRENIA	BRAFF, DAVID L.	UNIVERSITY OF CALIFORNIA SAN DIEGO	2012	NIMH	NIMH	$77,438	$229,338
1	R56	MH097849	1		POPULATION-BASED AUTISM GENETICS & ENVIRONMENT STUDY	BUXBAUM, JOSEPH D.	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	2012	NIMH	NIMH	$723,934	$1,980,279
1	U01	MH100233	1		1/4-THE AUTISM SEQUENCING CONSORTIUM: AUTISM GENE DISCOVERY IN >20,000 EXOMES	BUXBAUM, JOSEPH D.	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	2013	NIMH	NIMH	$817,786	$1,538,158
1	R03	MH099456	1		DEVELOPMENT OF GENETIC TOOLS TO STUDY CENTRAL AVP1B RECEPTORS	CALDWELL, HEATHER KINGSLEY	KENT STATE UNIVERSITY AT KENT	2012	NIMH	NIMH	$73,600	$144,256
1	R21	MH099504	1		NON-CODING RNAS IN AUTISM	CAMPBELL, DANIEL BRIAN	UNIVERSITY OF SOUTHERN CALIFORNIA	2013	NIMH	NIMH	$246,000	$451,365
1	R01	MH100172	1		BIOLOGY OF NON-CODING RNAS ASSOCIATED WITH PSYCHIATRIC DISORDERS	CAMPBELL, DANIEL BRIAN	UNIVERSITY OF SOUTHERN CALIFORNIA	2013	NIMH	NIMH	$430,144	$845,287
1	R01	HD077482	1		NEUROPSYCHOLOGICAL AND GENOMIC SIGNATURES OF VIOLENCE EXPOSURE IN CHILDHOOD	CASPI, AVSHALOM	DUKE UNIVERSITY	2013	NICHD	NICHD	$634,735	$1,251,698
1	R21	MH100670	1		A NOVEL TRANSLATIONAL MODEL OF AUTISUM SPECTRUM DISORDER	CHAN, ANTHONY WING SANG	EMORY UNIVERSITY	2013	NIMH	NIMH	$267,750	$490,875

1	R01	MH100351	1		IDENTIFYING THE POLYGENIC BASIS OF THE HUMAN BRAIN AND PSYCHIATRIC DISORDERS	CHEN, CHI-HUA	UNIVERSITY OF CALIFORNIA SAN DIEGO	2013	NIMH	NIMH	$427,463	$841,176
1	R01	MH101054	1		UNDERSTANDING THE GENETIC ARCHITECTURE OF SCHIZOPHRENIA IN CHINESE POPULATION	CHEN, XIANGNING et al.	VIRGINIA COMMONWEALTH UNIVERSITY	2013	NIMH	NIMH	$199,999	$399,990
1	R01	MH094400	01A1		1/3 - SEQUENCING AUTISM SPECTRUM DISORDER EXTENDED PEDIGREES	COON, HILARY	UNIVERSITY OF UTAH	2012	NIMH	NIMH	$299,000	$883,240
1	R01	MH099134	01A1		GENETIC ANALYSIS OF HIGH-RISK UTAH SUICIDE PEDIGREES	COON, HILARY	UNIVERSITY OF UTAH	2013	NIMH	NIMH	$741,901	$1,404,773
1	F30	MH102909	1		A NOVEL ESSENTIAL GENE FOR HUMAN COGNITIVE FUNCTION	COULTER, MICHAEL EDWARD	HARVARD MEDICAL SCHOOL	2013	NIMH	NIMH	$47,232	$47,232
1	K01	MH094406	01A1		SYSTEMS GENETICS OF FLUOXETINE-INDUCED NEUROGENESIS AND ANTIDEPRESSANT RESPONSE	CROWLEY, JAMES JOSEPH	UNIV OF NORTH CAROLINA CHAPEL HILL	2012	NIMH	NIMH	$156,686	$470,058
1	U01	MH094432	01A1		2/4-PSYCHIATRIC GWAS CONSORTIUM: GENOMIC FOLLOW-UP NEXT-GEN SEQUENCING & GENOTYPI	DALY, MARK JOSEPH	MASSACHUSETTS GENERAL HOSPITAL	2012	NIMH	NIMH	$559,381	$2,086,449
1	U01	MH100229	1		2/4-THE AUTISM SEQUENCING CONSORTIUM: AUTISM GENE DISCOVERY IN >20,000 EXOMES	DALY, MARK JOSEPH	BROAD INSTITUTE, INC.	2013	NIMH	NIMH	$483,807	$899,700

1	F32	HD071698	1		GENETIC & FUNCTIONAL ANALYSIS OF VARIANTS ASSOCIATED WITH NEUROCOGNITIVE DISORDER	DENNIS, MEGAN Y	UNIVERSITY OF WASHINGTON	2012	NICHD	NICHD	$52,190	$88,848
1	K99	NS083627	1		CHARACTERIZATION OF HUMAN-SPECIFIC DUPLICATED GENES IMPLICATED IN NEUROCOGNITIVE	DENNIS, MEGAN Y	UNIVERSITY OF WASHINGTON	2013	NINDS	NINDS	$90,000	$180,000
1	U01	MH100209	1		3/4 - THE AUTISM SEQUENCING CONSORTIUM: AUTISM GENE DISCOVERY IN >20,000 EXOMES	DEVLIN, BERNIE	UNIVERSITY OF PITTSBURGH AT PITTSBURGH	2013	NIMH	NIMH	$276,478	$540,453
1	R21	MH100919	01A1		AGING AND ANTIPSYCHOTIC EFFICACY - EPIGENETIC MECHANISMS	DONG, HONGXIN	NORTHWESTERN UNIVERSITY AT CHICAGO	2013	NIMH	NIMH	$231,750	$424,875
1	K99	MH101240	1		THE AGE-DEPENDENCE OF SYNAPTIC DEFICITS IN 22Q11.2 DELETION SYNDROME MOUSE MODELS	EARLS, LAURIE R	ST. JUDE CHILDREN'S RESEARCH HOSPITAL	2013	NIMH	NIMH	$88,265	$176,530
1	K01	AA021399	1		GENETIC INFLUENCES ON DEVELOPMENTAL HETEROGENEITY OF ALCOHOL USE DISORDER	EDWARDS, ALEXIS C	VIRGINIA COMMONWEALTH UNIVERSITY	2012	NIAAA	NIAAA	$143,856	$418,414
1	R01	MH101221	1		SPORADIC MUTATIONS AND AUTISM SPECTRUM DISORDERS	EICHLER, EVAN	UNIVERSITY OF WASHINGTON	2013	NIMH	NIMH	$713,231	$1,361,131

1	R21	MH094977	01A1		NOVEL TRANSGENIC TOOLS FOR ANALYSIS OF 5HT2C RECEPTOR EXPRESSION AND FUNCTION	EMESON, RONALD B.	VANDERBILT UNIVERSITY	2012	NIMH	NIMH	$194,832	$419,311
1	I01	BX001242	01A1		CONVERGENT GENETIC AND GENOMIC ANALYSES OF BIPOLAR DISORDER	FANOUS, AYMAN H	U.S. DEPT/VETS AFFAIRS MEDICAL CENTER	2012	VA			
1	SC3	GM103739	1		GENETIC AND MOLECULAR MECHANISMS OF ETHANOL-INDUCED DEVELOPMENTAL DEFECTS	FRENCH, RACHAEL LOUISE	SAN JOSE STATE UNIVERSITY	2013	NIGMS	NIGMS	$107,550	$215,100
1	R01	AA020637	01A1		GENETIC MECHANISMS OF CHANGE IN TRAJECTORIES OF DRINKING AND DEVIANT BEHAVIORS	FROMME, KIM	UNIVERSITY OF TEXAS, AUSTIN	2012	NIAAA	NIAAA	$468,470	$1,358,097
1	K23	MH100264	1		MICRORNAS AS BIOMARKERS IN FIRST-EPISODE SCHIZOPHRENIA	GALLEGO, JUAN ANDRES	FEINSTEIN INSTITUTE FOR MEDICAL RESEARCH	2013	NIMH	NIMH	$181,092	$361,045
1	I01	CX000751	01A2		GENETICS OF ANXIETY DISORDERS	GELERNTER, JOEL	VA CONNECTICUT HEALTHCARE SYSTEM	2013	VA			
1	F32	MH102971	1		SCHIZOPHRENIA GENETICS, NEURAL AND COGNITIVE PHENOTYPES, AND SOCIAL FUNCTIONING	GERMINE, LAURA	MASSACHUSETTS GENERAL HOSPITAL	2013	NIMH	NIMH	$49,214	$49,214
1	R21	HD076097	1		GENETIC AND FOOD ADVERTISEMENT INFLUENCES ON EATING WITHOUT HUNGER IN CHILDREN	GILBERT-DIAMOND, DIANE IHN AE	DARTMOUTH COLLEGE	2013	NICHD	NICHD	$202,188	$438,384

1	F32	MH100880	01A1		THE IMPACT OF ESTROGEN AND PAC1R GENOTYPE ON FEAR EXTINCTION IN WOMEN WITH PTSD	GLOVER, EBONY M	EMORY UNIVERSITY	2013	NIMH	NIMH	$57,811	$57,811
1	R01	MH097879	1		MICRORNA DYSREGULATION IN PSYCHIATRIC DISORDERS AND COGNITIVE DYSFUNCTION	GOGOS, JOSEPH A	COLUMBIA UNIVERSITY HEALTH SCIENCES	2012	NIMH	NIMH	$396,635	$1,176,142
1	R01	MH097971	01A1		1 OF 2: IDENTIFICATION OF RARE VARIANTS OF OCD	GOLDSTEIN, DAVID B.	DUKE UNIVERSITY	2013	NIMH	NIMH	$414,181	$785,579
1	R01	MH099216	01A1		IDENTIFYING DE NOVO MUTATIONS CAUSING OCD IN TRIOS BY WHOLE EXOME SEQUENCING	GOLDSTEIN, DAVID B. et al.	DUKE UNIVERSITY	2013	NIMH	NIMH	$791,759	$1,662,228
1	R01	MH101198	1		OPTOGENETIC TREATMENT OF SOCIAL BEHAVIOR IN AUTISM	GOLSHANI, PEYMAN	UNIVERSITY OF CALIFORNIA LOS ANGELES	2013	NIMH	NIMH	$385,000	$770,000
1	R01	MH101043	1		EPIGENETIC MARKERS FOR DEVELOPMENT OF SCHIZOPHRENIA	GUIDOTTI, ALESSANDRO	UNIVERSITY OF ILLINOIS AT CHICAGO	2013	NIMH	NIMH	$200,000	$397,416
1	U01	MH101719	1		1/5 INTERNATIONAL CONSORTIUM ON BRAIN AND BEHAVIOR IN 22Q11.2 DELETION SYNDROME	GUR, RAQUEL E	UNIVERSITY OF PENNSYLVANIA	2013	NIMH	NIMH	$656,491	$1,328,933
1	R01	MH093383	01A1		3/5-GENETICS OF TRANSCRIPTIONAL ENDOPHENOTYPES FOR SCHIZOPHRENIA	GUR, RUBEN C.	UNIVERSITY OF PENNSYLVANIA	2012	NIMH	NIMH	$80,000	$236,800
1	R01	MH097284	1		3/3-NETWORKS FROM MULTIDIMENSIONAL DATA FOR SCHIZOPHRENIA AND RELATED DISORDERS	HAKONARSON, HAKON	CHILDREN'S HOSP OF PHILADELPHIA	2012	NIMH	NIMH	$340,214	$819,415

1	R01	MH101493	1		ACTION MONITORING AND GENOMIC VARIANTS IN PEDIATRIC OBSESSIVE-COMPULSIVE BEHAVIOR	HANNA, GREGORY L. et al.	UNIVERSITY OF MICHIGAN	2013	NIMH	NIMH	$621,355	$1,227,311
1	R21	AA020588	01A1		GENETIC INFLUENCES ON ADOLESCENT DECISION-MAKING AND ALCOHOL USE	HARDEN, KATHRYN PAIGE	UNIVERSITY OF TEXAS, AUSTIN	2012	NIAAA	NIAAA	$234,671	$405,522
1	R01	DA033369	01A1		NEUROGENETIC PATHWAYS TO DRUG USE IN YOUNG ADULTS	HARIRI, AHMAD R	DUKE UNIVERSITY	2013	NIDA	NIDA	$353,250	$706,500
1	K08	DA032680	1		NOVEL USE OF GWAS FOR IMPROVED UNDERSTANDING OF NICOTINE DEPENDENCE	HARTZ, SARAH	WASHINGTON UNIVERSITY	2012	NIDA	NIDA	$137,458	$412,374
1	K08	MH096176	1		FUNCTIONAL ANALYSIS OF RARE VARIANTS IN GENES ASSOCIATED WITH AUTISM	HOFFMAN, ELLEN J	YALE UNIVERSITY	2012	NIMH	NIMH	$146,625	$439,875
1	K01	MH099232	01A1		DIMENSIONAL NEUROGENETIC MARKERS OF LIMBIC SYSTEM INTEGRITY & PSYCHIATRIC ILLNESS	HOLMES, AVRAM J	MASSACHUSETTS GENERAL HOSPITAL	2013	NIMH	NIMH	$151,333	$298,080
1	R01	DA033660	1		MULTIGENERATIONAL EPIGENETIC EFFECTS OF CANNABIS EXPOSURE	HURD, YASMIN L	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	2012	NIDA	NIDA	$426,244	$1,305,007
1	R01	MH095797	01A1		NOVEL STATISTICAL METHODS FOR DNA SEQUENCING DATA, AND APPLICATIONS TO AUTISM.	IONITA, IULIANA	COLUMBIA UNIVERSITY HEALTH SCIENCES	2012	NIMH	NIMH	$339,743	$972,630

1	R21	MH096208	01A1		GENE EXPRESSION AND FUNCTIONAL STUDIES FROM OLFACTORY NEURONS OF BIPOLAR DISORDER	ISHIZUKA, KOKO	JOHNS HOPKINS UNIVERSITY	2012	NIMH	NIMH	$202,500	$435,780
1	R01	DA031852	01A1		GENETIC INFLUENCES ON INHIBITORY CONTROL AND COCAINE SENSITIVITY	JENTSCH, J DAVID	UNIVERSITY OF CALIFORNIA LOS ANGELES	2012	NIDA	NIDA	$315,775	$1,055,792
1	R01	MH097997	01A1		ROLE OF DISC1 AND NRG1 IN OLIGODENDROCYTE DEVELOPMENT IN SCHIZOPHRENIA	KATSEL, PAVEL LEON	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	2013	NIMH	NIMH	$303,178	$600,087
1	R01	MH094483	01A1		THE BIPOLAR GENOME STUDY	KELSOE, JOHN R. et al.	UNIVERSITY OF CALIFORNIA SAN DIEGO	2012	NIMH	NIMH	$827,481	$2,171,370
1	R01	MH100549	1		THE MOLECULAR GENETICS OF RECURRENT MAJOR DEPRESSION IN CHINESE WOMEN	KENDLER, KENNETH SEEDMAN	VIRGINIA COMMONWEALTH UNIVERSITY	2013	NIMH	NIMH	$694,506	$1,276,878
1	IK2	CX000525	01A1		GENE X ENVIRONMENT EFFECTS ON PTSD	KIMBREL, NATHAN A.	OLIN TEAGUE VETERANS CENTER	2012	VA			
1	U01	MH096844	01A1		2/3-GENOMICS OF SCHIZOPHRENIA IN THE SOUTH AFRICAN XHOSA	KING, MARY-CLAIREet al.	UNIVERSITY OF WASHINGTON	2013	NIMH	NIMH	$427,540	$855,080
1	R03	AA021968	1		A NOVEL GPCR-MEDIATED STEROID SIGNALING THAT CONTROLS ALCOHOL-INDUCED BEHAVIOR	KITAMOTO, TOSHIHIRO	UNIVERSITY OF IOWA	2013	NIAAA	NIAAA	$75,500	$148,735
1	R01	DA033080	01A1		BEHAVIORAL AND GENETIC MECHANISMS OF SMOKING RISK IN INDIVIDUALS WITH ADHD	KOLLINS, SCOTT H	DUKE UNIVERSITY	2012	NIDA	NIDA	$430,911	$1,276,780

1	R21	MH097893	01A1		SCHIZOPHRENIA-ASSOCIATED LONG NON-CODING RNAS IN NEURONS DERIVED FROM IPS CELLS	LACHMAN, HERBERT M	ALBERT EINSTEIN COLLEGE OF MEDICINE	2013	NIMH	NIMH	$250,500	$459,250
1	R01	MH101487	1		DIMENSIONAL RDOC MODELING ACROSS THE RANGE OF NEGATIVE MOOD DYSFUNCTION	LANGENECKER, SCOTT A	UNIVERSITY OF ILLINOIS AT CHICAGO	2013	NIMH	NIMH	$627,944	$1,332,264
1	R01	ES021707	1		METHYLOMIC AND GENOMIC IMPACTS OF ORGANIC POLLUTANTS IN DUP15Q SYNDROME	LASALLE, JANINE M	UNIVERSITY OF CALIFORNIA AT DAVIS	2012	NIEHS	NIEHS	$346,406	$1,057,618
1	R21	MH099868	01A1		PHARMACOGENETIC PREDICTION OF ANTIPSYCHOTIC INDUCED WEIGHT GAIN	LENCZ, TODD	FEINSTEIN INSTITUTE FOR MEDICAL RESEARCH	2013	NIMH	NIMH	$252,750	$463,375
1	R01	MH096262	01A1		HLA AND SCHIZOPHRENIA: A HIGH-THROUGHPUT SEQUENCING STUDY	LEVINSON, DOUGLAS FREDERICK	STANFORD UNIVERSITY	2012	NIMH	NIMH	$771,826	$2,105,365
1	R21	MH097470	01A1		NEUROBIOLOGY OF A MUTATION IN GLYCINE METABOLISM IN PSYCHOTIC DISORDERS	LEVY, DEBORAH L	MCLEAN HOSPITAL	2012	NIMH	NIMH	$270,439	$525,107
1	R21	AA020356	01A1		NOVEL ANALYSIS OF GENE-GENE AND GENE-ENVIRONMENT INTERACTIONS IN ALCOHOLISM	LOBACH, IRYNA	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO	2013	NIAAA	NIAAA	$186,635	$407,060
1	F30	MH099785	01A1		IDENTIFYING FUNCTIONAL VARIATION IN SCHIZOPHRENIA GWAS LOCI BY POOLED SEQUENCING	LOKEN, ERIK	VIRGINIA COMMONWEALTH UNIVERSITY	2013	NIMH	NIMH	$32,630	$65,896

1	R21	MH096139	01A1		TRANSCRIPTOME ASSOCIATION WITH INFLAMMATION-RELATED MAJOR DEPRESSION	LOTRICH, FRANCIS E	UNIVERSITY OF PITTSBURGH AT PITTSBURGH	2012	NIMH	NIMH	$155,574	$340,312
1	F30	MH098571	1		HIGH THROUGHPUT SEQUENCING OF AUTISM SPECTRUM DISORDER (ASD) ENDOPHENOTYPES	LU, JAMES T	BAYLOR COLLEGE OF MEDICINE	2012	NIMH	NIMH	$39,432	$118,740
1	R01	MH099851	01A1		GABAERGIC CONTROL OF DEPRESSION RELATED BRAIN STATES	LUSCHER, BERNHARD	PENNSYLVANIA STATE UNIVERSITY-UNIV PARK	2013	NIMH	NIMH	$525,728	$999,978
1	K01	MH093870	01A1		NEUROIMAGING AND GENETIC BIOMARKERS OF LITHIUM RESPONSE IN BIPOLAR DISORDER	MAHON, PAMELA BELMONTE	JOHNS HOPKINS UNIVERSITY	2012	NIMH	NIMH	$179,802	$537,741
1	R21	MH099419	1		FUNCTIONAL CHARACTERIZATION OF PATHWAYS REGULATED BY SCHIZOPHRENIA GENE TCF4	MCCLAY, JOSEPH LOUIE	VIRGINIA COMMONWEALTH UNIVERSITY	2012	NIMH	NIMH	$299,000	$406,640
1	I01	BX002150	1		ANALYSIS OF RORA AND OTHER CANDIDATE GENES IN PTSD	MILLER, MARK W	VA BOSTON HEALTH CARE SYSTEM	2013	VA			
1	K01	MH093750	01A1		GENE-ENVIRONMENT INTERPLAY IN THE COMORBIDITY OF PTSD AND DISORDERED EATING	MITCHELL, KAREN S.	BOSTON UNIVERSITY MEDICAL CAMPUS	2012	NIMH	NIMH	$175,045	$526,298
1	K22	MH097826	1		CA3-RESTRICTED BDNF KNOCKOUT AS A MODEL OF ABNORMAL TRAITS IN SOCIAL BEHAVIORS	MOROZOV, ALEXEI	VIRGINIA POLYTECHNIC INST AND ST UNIV	2012	NIMH	NIMH	$324,000	$972,000

1	F31	AA022557	1		SYNAPTIC MRNA AND MICRORNA: REGULATION BY CHRONIC ALCOHOL CONSUMPTION	MOST, DANA	UNIVERSITY OF TEXAS, AUSTIN	2013	NIAAA	NIAAA	$37,826	$76,096
1	K99	MH101255	1		IDENTIFYING SCHIZOPHRENIA RISK LOCI IN THE MHC USING NEXT GENERATION SEQUENCING	MUKHERJEE, SEMANTI	FEINSTEIN INSTITUTE FOR MEDICAL RESEARCH	2013	NIMH	NIMH	$90,000	$179,999
1	R01	DA034862	1		ALPHA 5 NICOTINIC RECEPTOR SUBUNIT GENE POLYMORPHISMS AND SMOKING ADDICTION	MUKHIN, ALEXEY G	DUKE UNIVERSITY	2013	NIDA	OD	$392,500	$785,000
1	R21	MH096257	1		DISRUPTION OF AN EPIGENETIC LOCUS CONTROLLING EAAC1 EXPRESSION IN SCHIZOPHRENIA	MYLES-WORSLEY, MARINA et al.	UPSTATE MEDICAL UNIVERSITY	2012	NIMH	NIMH	$319,000	$433,840
1	R01	MH094469	01A1		QUANTIFYING THE IMPACT OF RARE MUTATIONS ON ADHD	NEALE, BENJAMIN MICHAEL	BROAD INSTITUTE, INC.	2012	NIMH	NIMH	$677,984	$2,000,138
1	R01	MH097993	01A1		2/2 - IDENTIFICATION OF RARE VARIANTS OF OCD	NESTADT, GERALD	JOHNS HOPKINS UNIVERSITY	2013	NIMH	NIMH	$359,850	$719,700
1	P50	MH096890	1		EPIGENETIC MECHANISMS OF DEPRESSION	NESTLER, ERIC J	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	2012	NIMH	NIMH	$2,000,000	$5,934,238
1	F31	MH102978	1		INVESTIGATING THE ROLE OF DISC1 USING IPSCS FROM PATIENTS WITH MENTAL DISORDERS	NGUYEN, HA NAM	JOHNS HOPKINS UNIVERSITY	2013	NIMH	NIMH	$42,232	$42,232
1	K99	LM011384	1		INTEGRATION OF BIO-, MEDICAL, AND IMAGING INFORMATICS FOR COMPLEX DISEASES	NHO, KWANGSIK TIMOTHY	INDIANA UNIV-PURDUE UNIV AT INDIANAPOLIS	2012	NLM	NLM	$90,000	$531,925

1	R01	MH099064	01A1		ADHD BIOTYPES USING GENETIC AND IMAGING APPROACHES	NIGG, JOEL T	OREGON HEALTH & SCIENCE UNIVERSITY	2013	NIMH	NIMH	$704,724	**$1,467,576**
1	R01	MH093246	01A1		MULTI-PRONGED GENETIC STUDIES OF SCHIZOPHRENIA IN AN INBRED POPULATION	NIMGAONKAR, VISHWAJIT LAXMIKANT et al.	UNIVERSITY OF PITTSBURGH AT PITTSBURGH	2012	NIMH	FIC	$10,000	**$1,514,879**
1	R01	MH093745	01A1		4/5 GENETICS OF TRANSCRIPTIONAL ENDOPHENOTYPES IN SCHIZOPHRENIA	NIMGAONKAR, VISHWAJIT LAXMIKANT	UNIVERSITY OF PITTSBURGH AT PITTSBURGH	2012	NIMH	NIMH	$75,750	**$224,220**
1	R21	MH098035	01A1		PARENTAL AGE AND SCHIZOPHRENIA SUSCEPTIBILITY	OPHOFF, ROEL A	UNIVERSITY OF CALIFORNIA LOS ANGELES	2013	NIMH	NIMH	$308,000	**$423,500**
1	R01	MH096946	1		CELL ADHESION MOLECULES IN AUTISM: A WHOLE-BRAIN STUDY OF GENETIC MOUSE MODELS	OSTEN, PAVEL	COLD SPRING HARBOR LABORATORY	2012	NIMH	NIMH	$485,438	**$1,448,658**
1	F32	HD078051	1		INVESTIGATING ROLE OF NEUREXIN-1 MUTATION IN AUTISM USING HUMAN INDUCED NEURONS	PAK, CHANGHUI	STANFORD UNIVERSITY	2013	NICHD	NICHD	$49,214	**$49,214**
1	K01	AA021113	1		SYSTEM GENETICS OF ALCOHOLISM: NETWORK-BASED APPROACHES FOR GENETIC ASSOCIATION	PALMER, ROHAN HUGH CRAIG	RHODE ISLAND HOSPITAL	2012	NIAAA	NIAAA	$171,104	**$496,202**
1	R21	MH099448	1		FUNCTIONAL STUDIES OF VARIANTS OF THE BIPOLAR RISK GENE CACNA1C IN HUMAN NEURONS	PAN, JEN	BROAD INSTITUTE, INC.	2012	NIMH	NIMH	$259,500	**$467,100**

1	F30	MH099886	1		TRANSCRIPTIONAL REGULATORS IN NORMAL HUMAN BRAIN DEVELOPMENT AND AUTISM	PARIKSHAK, NEELROOP NARENDRA	UNIVERSITY OF CALIFORNIA LOS ANGELES	2012	NIMH	NIMH	$30,002	$64,218
1	R01	MH093526	01A1		5/5 GENETICS OF TRANSCRIPTIONAL ENDOPHENOTYPES FOR SCHIZOPHRENIA	PERRY, RODNEY T	UNIVERSITY OF ALABAMA AT BIRMINGHAM	2012	NIMH	NIMH	$73,250	$216,820
1	R01	MH092380	01A1		GENETIC DETERMINANTS OF SCHIZOPHRENIA INTERMEDIATE PHENOTYPES	PETRYSHEN, TRACEY	MASSACHUSETTS GENERAL HOSPITAL	2012	NIMH	NIMH	$741,275	$1,720,246
1	R21	MH100570	1		CIRCUIT-SPECIFIC BIDIRECTIONAL TRANSCRIPT MODULATION OF PSYCHIATRIC RISK GENES	PETRYSHEN, TRACEY	MASSACHUSETTS GENERAL HOSPITAL	2013	NIMH	NIMH	$241,020	$447,420
1	R21	DA034457	1		THE EFFECTS OF SMOKING ON DNA METHYLATION IN PRIMARY HUMAN LYMPHOCYTES.	PHILIBERT, ROBERT A	UNIVERSITY OF IOWA	2012	NIDA	NIDA	$188,750	$369,950
1	R01	MH096875	01A1		ANIMAL MODEL OF GENETICS AND SOCIAL BEHAVIOR IN AUTISM SPECTRUM DISORDERS	PLATT, MICHAEL L	DUKE UNIVERSITY	2012	NIMH	NIMH	$791,070	$2,122,925
1	R21	HG006560	1		THE IMPACT OF UNCERTAINTY IN GENOME-WIDE TESTING FOR AUTISM SPECTRUM DISORDER	REIFF, MARIAN F	UNIVERSITY OF PENNSYLVANIA	2012	NHGRI	NHGRI	$240,000	$440,000
1	R01	MH096764	1		GENETIC AND ESTROGEN-DEPENDENT REGULATION OF THE HUMAN PAC1R RECEPTOR AND PTSD	RESSLER, KERRY J	EMORY UNIVERSITY	2012	NIMH	NIMH	$400,595	$1,252,123

1	R21	MH096030	01A1		INFLAMMATION-INDUCED BEHAVIORAL ALTERATIONS: A PSYCHOGENOMIC APPROACH	RODRIGUEZ ZAS, SANDRA L	UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN	2012	NIMH	NIMH	$277,375	$429,535
1	R01	MH101425	1		MRI STUDIES OF FOLATE-RELATED GENES, DIET, AND DEVELOPMENT: PROMISE FOR PSYCHOSIS	ROFFMAN, JOSHUA LAWRENCE	MASSACHUSETTS GENERAL HOSPITAL	2013	NIMH	NIMH	$680,490	$1,355,800
1	R03	MH099426	1		WHOLE GENOME SEQUENCING OF MULTIPLEX BIPOLAR FAMILIES	ROSS, JESSICA	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO	2012	NIMH	NIMH	$78,292	$153,732
1	R01	MH096847	01A1		IMPACT OF SYNGAP1 MUTATIONS ON SYNAPSE MATURATION AND COGNITIVE DEVELOPMENT	RUMBAUGH, GAVIN R	SCRIPPS FLORIDA	2012	NIMH	NIMH	$789,981	$2,066,119
1	R01	MH098059	1		GENE EXPRESSION IN AN AFRICAN AMERICAN SCHIZOPHRENIA DATASET	SANDERS, ALAN R	NORTHSHORE UNIVERSITY HEALTHSYSTEM	2012	NIMH	NIMH	$594,469	$1,609,449
1	R01	MH094382	01A1		3/3-SEQUENCING AUTISM SPECTRUM DISORDER EXTENDED PEDIGREES	SCHELLENBERG, GERARD DAVID	UNIVERSITY OF PENNSYLVANIA	2012	NIMH	NIMH	$160,000	$473,600
1	R21	MH099251	01A1		EPIGENETIC MODULATION OF ANTIDEPRESSANT EFFICACY	SCHMAUSS, CLAUDIA	COLUMBIA UNIVERSITY HEALTH SCIENCES	2013	NIMH	NIMH	$240,000	$440,000
1	F31	MH099786	01A1		FUNCTIONAL CONNECTIVITY AS A PREDICTOR OF PSYCHOSIS IN 22Q11.2 DELETION SYNDROME	SCHREINER, MATTHEW JAMES	UNIVERSITY OF CALIFORNIA LOS ANGELES	2013	NIMH	NIMH	$35,832	$72,108

1	U01	MH094411	01A1		3/4-PSYCHIATRIC GWAS CONSORTIUM: GENOMIC FOLLOW-UP NEXT-GEN SEQUENCING & GENOTYPI	SEBAT, JONATHAN	UNIVERSITY OF CALIFORNIA SAN DIEGO	2012	NIMH	NIMH	$504,093	$1,991,528
1	R21	MH092840	01A1		BRAIN FUNCTION AND STRUCTURE IN YOUNG CHILDREN AT FAMILIAL RISK FOR SCHIZOPHRENIA	SEIDMAN, LARRY Jet al.	BETH ISRAEL DEACONESS MEDICAL CENTER	2012	NIMH	NIMH	$276,018	$481,765
1	R01	MH101459	1		BROAD SCALE GENOMIC ANALYSIS TO FIND GENES ASSOCIATED WITH DEPRESSION UNDER STRES	SEN, SRIJAN	UNIVERSITY OF MICHIGAN	2013	NIMH	NIMH	$467,393	$936,915
1	R01	MH094358	01A1		THE H3K9 HISTONE SWITCH; 'LEVELS' IN SCHIZOPHRENIA BLOOD AND BRAIN	SHARMA, RAJIV PANDIT	UNIVERSITY OF ILLINOIS AT CHICAGO	2012	NIMH	NIMH	$487,643	$1,428,400
1	U01	MH096296	1		4/4-PSYCHIATRIC GWAS CONSORTIUM:GENOMIC FOLLOW-UP NEXT-GEN SEQUENCING & GENOTYPI	SKLAR, PAMELA	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	2012	NIMH	NIMH	$297,635	$6,851,210
1	R01	MH097276	1		1/3-NETWORKS FROM MULTIDIMENSIONAL DATA FOR SCHIZOPHRENIA AND RELATED DISORDERS	SKLAR, PAMELA et al.	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI	2012	NIMH	NIMH	$994,301	$2,526,121
1	R01	MH101486	1		NEURAL AND GENETIC BASIS OF NEGATIVE VALANCE TRAITS	SMOLLER, JORDAN W et al.	MASSACHUSETTS GENERAL HOSPITAL	2013	NIMH	NIMH	$691,403	$1,386,909
1	R21	MH094781	01A1		IMAGING GENETIC PREDICTORS OF PSYCHOTHERAPY OUTCOMES IN UNIPOLAR DEPRESSION	SMOSKI, MORIA J. et al.	DUKE UNIVERSITY	2012	NIMH	NIMH	$205,300	$492,206

1	R01	MH085667	01A1		SEARCHING FOR ENDOPHENOTYPES OF BIPOLAR DISORDER	SOARES, JAIR C	UNIVERSITY OF TEXAS HLTH SCI CTR HOUSTON	2012	NIMH	NIMH	$691,091	$1,825,436
1	U01	MH100239	1		4/4 THE AUTISM SEQUENCING CONSORTIUM: AUTISM GENE DISCOVERY IN >20,000 EXOMES	STATE, MATTHEW W.	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO	2013	NIMH	NIMH	$759,778	$1,434,627
1	U01	MH096754	01A1		3/3 GENOMICS OF SCHIZOPHRENIA IN THE SOUTH AFRICAN XHOSA	STEIN, DAN JOSEPH	UNIVERSITY OF CAPE TOWN	2013	NIMH	NIMH	$666,356	$1,257,931
1	R21	MH098662	1		GENETIC AND TRAUMA-RELATED RISK FACTORS FOR PTSD AND DEPRESSION IN SOUTH AFRICA	STEIN, DAN JOSEPH	UNIVERSITY OF CAPE TOWN	2013	NIMH	FIC	$20,000	$215,974
1	R34	MH099208	01A1		SEQUENCING TREATMENTS FOR MOTHERS WITH ADHD & THEIR AT-RISK CHILDREN: A SMART PIL	STEIN, MARK A et al.	SEATTLE CHILDREN'S HOSPITAL	2013	NIMH	NIMH	$277,537	$504,420
1	U01	MH094421	01A1		1/4 PSYCHIATRIC GWAS CONSORTIUM: GENOMIC FOLLOW-UP NEXT-GEN SEQUENCING & GENOTYPI	SULLIVAN, PATRICK F	UNIV OF NORTH CAROLINA CHAPEL HILL	2012	NIMH	NIMH	$491,979	$1,441,338
1	R01	MH097281	1		2/2-CIS & TRANS-DATA INTEGRATION TO FIND MECHANISMS CAUSING PSYCHIATRIC DISORDERS	SULLIVAN, PATRICK F	UNIV OF NORTH CAROLINA CHAPEL HILL	2012	NIMH	NIMH	$222,000	$740,103

1	R21	MH099370	1		THE MIR137 REGION IN SCHIZOPHRENIA: GENOMICS, VARIANT DISCOVERY & ASSOCIATION	SULLIVAN, PATRICK F et al.	UNIV OF NORTH CAROLINA CHAPEL HILL	2013	NIMH	NIMH	$228,000	**$418,000**
1	U01	MH096756	01A1		1/3 - GENOMICS OF SCHIZOPHRENIA IN THE SOUTH AFRICA XHOSA	SUSSER, EZRA S.	COLUMBIA UNIVERSITY HEALTH SCIENCES	2013	NIMH	NIMH	$381,640	**$743,256**
1	U01	MH101722	1		"4/5 INTERNATIONAL CONSORTIUM ON BRAIN AND BEHAVIOR IN 22Q11.2 DELETION SYNDROME"	SWILLEN, ANN	KATHOLIEKE UNIVERSITEIT LEUVEN	2013	NIMH	NIMH	$333,329	**$664,826**
1	K99	MH095867	01A1		COMPLEX GENETIC ARCHITECTURE OF CHROMOSOMAL ABERRATIONS IN AUTISM	TALKOWSKI, MICHAEL E	MASSACHUSETTS GENERAL HOSPITAL	2012	NIMH	NIMH	$92,917	**$434,833**
1	R21	MH097150	1		EPIGENETIC MECHANISMS IN THE PERPETUATION OF ANOREXIA NERVOSA-LIKE BEHAVIOR	TAMASHIRO, KELLIE L. K.	JOHNS HOPKINS UNIVERSITY	2012	NIMH	NIMH	$243,000	**$437,400***
1	R01	MH101053	1		EFFECTS OF GENES AND CHILDHOOD ENVIRONMENT ON BRAIN MECHANISMS OF SCHIZOPHRENIA R	TAN, HAO YANG	LIEBER INSTITUTE, INC.	2013	NIMH	NIMH	$200,000	**$394,420**
1	R01	DA034076	01A1		IDENTIFYING AMPHETAMINE ADDICTION RISK VARIANTS BY WHOLE GENOME SEQUENCING	THORGEIRSSON, THORGEIR E.	DECODE GENETICS, EHF	2013	NIDA	NIDA	$536,514	**$1,070,667**
1	R01	MH103102	1		EPIGENOMIC HOTSPOTS LINKING ENVIRONMENTAL ADVERSITY & STRESS TO PSYCHOPATHOLOGY	TOTH, MIKLOS	WEILL MEDICAL COLL OF CORNELL UNIV	2013	NIMH	NIMH	$334,830	**$669,660**

1	R21	MH094862	01A1		INTEGRATIVE ANALYSIS OF TRANSCRIPTOME, GENOME AND DISEASE DIVERSITY IN MAJOR DEPR	TSENG, GEORGE C.et al.	UNIVERSITY OF PITTSBURGH AT PITTSBURGH	2012	NIMH	NIMH	$170,975	$370,621
1	R01	MH094524	01A1		MINING THE GENOMEWIDE SCAN: GENETIC PROFILES OF STRUCTURAL LOSS IN SCHIZOPHRENIA	TURNER, JESSICA et al.	THE MIND RESEARCH NETWORK	2012	NIMH	NIMH	$698,176	$1,870,515
1	F31	MH101984	1		THE EPIGENETIC LINK BETWEEN ENVIRONMENTAL EXPOSURE AND ADULT ONSET DEPRESSION	TYLER, CHRISTINA RENE	UNIVERSITY OF NEW MEXICO HEALTH SCIS CTR	2013	NIMH	NIMH	$28,501	$57,802
1	U01	MH101724	1		5/5 INTERNATIONAL CONSORTIUM ON BRAIN AND BEHAVIOR IN 22Q11.2 DELETION SYNDROME	VAN DEN BREE, MARIANNE e t al.	CARDIFF UNIVERSITY	2013	NIMH	NIMH	$230,990	$441,158
1	R01	MH097283	1		1/2-CIS & TRANS-DATA INTEGRATION TO FIND MECHANISMS CAUSING PSYCHIATRIC DISORDER	VAN DEN OORD, EDWIN	VIRGINIA COMMONWEALTH UNIVERSITY	2012	NIMH	NIMH	$373,750	$996,418
1	U01	AA020890	1		STRESS EFFECTS ON ALCOHOL CONSUMPTION: AGE OF ONSET AND GENES IN HEAVY DRINKERS	WAND, GARY S et al.	JOHNS HOPKINS UNIVERSITY	2012	NIAAA	NIAAA	$318,559	$914,244
1	R01	GM097331	01A1		CHARACTERIZATION OF THE SCHIZOPHRENIA-ASSOCIATED 3Q29 DELETION IN MOUSE	WARREN, STEPHEN T. et al.	EMORY UNIVERSITY	2012	NIGMS	NIGMS	$404,198	$1,409,718

1	U01	MH101720	1		2/5 INTERNATIONAL CONSORTIUM ON BRAIN AND BEHAVIOR IN 22Q11.2 DELETION SYNDROME	WARREN, STEPHEN T.	EMORY UNIVERSITY	2013	NIMH	NIMH	$1,750,996	$3,469,910
1	I01	BX001146	01A1		CELLULAR CIRCADIAN CLOCKS IN MOOD DISORDERS	WELSH, DAVID K	VA SAN DIEGO HEALTHCARE SYSTEM	2012	VA			
1	R21	MH096697	1		A NETWORK APPROACH TO THE PREDICTION OF AUTISM SPECTRUM DISORDERS	WEST, MEREDITH J	INDIANA UNIVERSITY BLOOMINGTON	2012	NIMH	NIMH	$223,949	$400,541
1	R03	AG045301	1		GENE-BY-ENVIRONMENT INTERACTIONS, SOCIAL STRESS, AND DEPRESSION IN OLDER ADULTS	WHISMAN, MARK A	UNIVERSITY OF COLORADO	2013	NIA	NIA	$26,250	$76,250
1	R01	MH094293	01A1		2/3 SEQUENCING AUTISM SPECTRUM DISORDER EXTENDED PEDIGREES	WIJSMAN, ELLEN M	UNIVERSITY OF WASHINGTON	2012	NIMH	NIMH	$231,688	$685,918
1	R21	MH096154	1		SUICIDE EPIGENETICS	WILLOUR, VIRGINIA L	UNIVERSITY OF IOWA	2012	NIMH	NIMH	$206,589	$407,958
1	R01	MH095810	01A1		IDENTIFICATION OF SYNAPTIC MECHANISMS OF 22Q11 DELETION SYNDROME	ZAKHARENKO, STANISLAVS	ST. JUDE CHILDREN'S RESEARCH HOSPITAL	2012	NIMH	NIMH	$437,500	$1,295,000
1	DP1	MH100706	1		PROBING NEUROPSYCHIATRIC DISEASES USING TARGETED EPIGENOME AND GENOME ENGINEERING	ZHANG, FENG	BROAD INSTITUTE, INC.	2012	NIMH	OD	$865,000	$2,569,050

1	R01	MH097018	01A1		EPIGENETIC DETERMINANTS OF MAJOR DEPRESSION: A MONOZYGOTIC DISCORDANT TWIN STUDY	ZHAO, JINYING et al.	TULANE UNIVERSITY OF LOUISIANA	2013	NIMH	NIMH	$647,139	**$1,257,940**

$98,206,620.00

Note: VA grants do not have information about costs.

Supplementary Table 2. Grants with Psychiatric Genetic Components Funded by Chinese Agencies in 2012 and 2013

FoundationSource-Year	Sections	Categories	Title	PI	Inst.	Notes	RMB (10,000 as unit)
自然科学基金2012	生命科学部	面上项目	多巴胺受体家族介导安非他明成瘾机制研究	魏曙光	西安交通大学	遗传学与生物信息学	70
自然科学基金2012	生命科学部	面上项目	与尼古丁成瘾相关的神经系统信号通路分析	王　举	天津医科大学	遗传学与生物信息学	60
自然科学基金2012	生命科学部	面上项目	单相抑郁症与5-HTR信号转导通路基因-环境作用机制研究	杨艳杰	哈尔滨医科大学	神经科学认知科学与心理学	80
自然科学基金2012	生命科学部	面上项目	创伤后应激障碍的家系、表观遗传及神经影像研究	范　方	华南师范大学	神经科学认知科学与心理学	85
自然科学基金2012	生命科学部	面上项目	遗传基因与环境对青少年早期抑郁的影响及其作用机制：一项追踪研究	张文新	山东师范大学	神经科学认知科学与心理学	70
自然科学基金2012	生命科学部	面上项目	多巴胺D4受体基因多态性变异体通过PSD-95调节NMDA受体功能的研究	刘文华	肇庆学院	神经科学认知科学与心理学	85
自然科学基金2012	生命科学部	面上项目	调节GALR2基因关键转录因子的鉴定及其在抑郁中的作用	杨予涛	首都医科大学	神经科学认知科学与心理学	76
自然科学基金2012	生命科学部	青年基金项目	Orexin A在下丘脑-海马通路介导吗啡成瘾中的作用及机制	张雪琴	广州医学院	神经科学认知科学与心理学	26
自然科学基金2012	生命科学部	优秀青年基金	DTNBP1选择性剪接异常在精神分裂症发病中的作用机制研究	许　琪	中国医学科学院基础医学		100
自然科学基金2012	医学部	地区科学基金项目	BDNF基因多态性及DNA甲基化差异与创伤后应激障碍内表型的研究	郭敏	海南省人民医院	关键词：脑源性神经营养因子;基因多态性;甲基化;创伤后应激障碍	49
自然科学基金2012	医学部	国际(地区)合作与交流项目	通过多疾病分析揭示孤独症的遗传学机制	邢清和	复旦大学	关键词：孤独症;精神分裂症;双相情感障碍;全基因组关联分析;基因	30
自然科学基金2012	医学部	青年科学基金项目	基于影像基因组学的microRNA与精神分裂症关联研究	邱承祥	中国科学院自动化研究所	关键词：精神分裂症;磁共振影像;影像基因组学;小RNA;单核苷酸多态性	23
自然科学基金2012	医学部	面上项目	重性抑郁障碍和双相障碍患者AMY-VPFC环路的差异及EAAT基因多态性对其影响的研究	汤艳清	中国医科大学	关键词：重性抑郁障碍;双相障碍;情感神经环路;磁共振;基因多态性	80
自然科学基金2012	医学部	面上项目	miR-181调控GABA系统基因在苯丙胺类兴奋剂所致精神障碍中的作用机制	赵敏	上海市精神卫生中心	关键词：苯丙胺类兴奋剂;精神障碍;miR-181;GABA能系统;基因	70
自然科学基金2012	医学部	面上项目	酒依赖者情感相关脑区的结构功能损害与成瘾易感基因的关联性研究	孙洪强	北京回龙观医院	关键词：酒依赖;情感;神经影像;遗传多态性;冲动性行为	70
自然科学基金2012	医学部	地区科学基金项目	Wnt/β-catenin信号通路表观遗传调控及干预在自闭症发病中的作用研究	王中平	九江学院	关键词：自闭症;Wnt/β-catenin信号通路;表观遗传;DNA甲基化;组蛋白乙酰化	70
自然科学基金2012	医学部	青年科学基金项目	中国汉族人群尼古丁依赖的易感基因位点关联分析及易感基因功能研究	张学伟	中南大学	关键词：吸烟;易感位点;多态;关联分析;脑源性神经营养因	23
自然科学基金2012	医学部	面上项目	人染色体7q36区域男性同性恋行为相关基因的精细定位研究	冯铁建	深圳市慢性病防治中心	关键词：同性恋行为;7q36区域;自定义芯片;飞行时间质谱;关联分析	70
自然科学基金2012	医学部	青年科学基金项目	精神疾病致病基因NPAS3对VGF转录调控机制的研究	沙丽	大连医科大学	关键词：精神分裂症;转录调控;基因表达谱分析;神经先驱细胞;启动子	23
自然科学基金2012	医学部	青年科学基金项目	精神发育迟滞和精神分裂症同卵双生家系的外显子组测序研究	管丽丽	北京大学	关键词：精神发育迟滞;精神分裂症;同卵双生子;家系;外显子组测序	24
自然科学基金2012	医学部	青年科学基金项目	早发性精神分裂症患者核心家系的后GWAS分析	李文强	新乡医学院	关键词：早发性精神分裂症;核心家系;全基因组关联分析;单核甘酸多态性	23
自然科学基金2012	医学部	青年科学基金项目	采用近亲婚配特殊家系进行常染色体隐性遗传NSMR致病基因的定位与克隆	薛晋杰	中南大学	关键词：精神发育障碍;近亲婚配;全外显子组捕获测序;纯合子定位;致病基因定位克隆	23
自然科学基金2012	医学部	面上项目	Brg1蛋白参与可卡因成瘾及其表观遗传学机制研究	岑小波	四川大学	关键词：可卡因;Brg1;表观遗传学机制;染色质重塑;成瘾	70
自然科学基金2012	医学部	面上项目	酒精依赖患者血清microRNA的差异表达及靶向调控分析	胡建	哈尔滨医科大学	关键词：酒精依赖;基因表达;microRNA;靶基因	65
自然科学基金2012	医学部	重大研究计划	抑郁症脑神经环路功能的分子遗传机制研究	马小红	四川大学	关键词：抑郁症;认知;基因;磁共振成像;疾病表型	60
自然科学基金2012	医学部	面上项目	注意缺陷多动障碍从基因到临床表型的路径分析	杨斌让	深圳市儿童医院	关键词：注意缺陷多动障碍;基因;表型;路径分析;内表型	70
自然科学基金2012	医学部	面上项目	MicroRNAs在抑郁症及氯胺酮抗抑郁中的作用及机制研究	王晓斌	泸州医学院	关键词：microRNAs;抑郁症;氯胺酮	70
自然科学基金2012	医学部	重大研究计划	杏仁核和腹内侧前额皮层染色质组蛋白乙酰化修饰在吗啡戒断引起的负性情感消退学习中的作用研究	刘景根	中国科学院上海药物研究所	关键词：负性情感;消退;腹内侧前额皮层;乙酰化	70
自然科学基金2012	医学部	重大研究计划	MeCP2-PTEN调控神经干细胞增殖分化影响孤独症发生的分子机制	周文浩	复旦大学	关键词：MeCP2;孤独症;PTEN;神经干细胞	60
自然科学基金2012	医学部	面上项目	散发精神分裂症新异突变与白质纤维连接异常的相关性研究	王强	四川大学	关键词：精神分裂症;散发患者;新异突变;外显子测序;白质纤维连接	65
自然科学基金2012	医学部	面上项目	利用光控shRNA-NF1基因特异敲减小鼠研究Ras-MAPK信号通路在多动症中的作用机制	李卫东	上海交通大学	关键词：多动症;1型神经纤维瘤;光遗传学;基因敲减;小鼠模型	70
自然科学基金2012	医学部	面上项目	DNA甲基化在产前应激子代抑郁中的机制研究	朱忠良	西北大学	关键词：产前应激;甲基化;抑郁;海马	90
自然科学基金2012	医学部	重大研究计划	TNF-α基因多态性调节抑郁障碍认知功能损害的脑网络机制研究	方贻儒	上海市精神卫生中心	关键词：抑郁障碍;TNF;工作记忆;MRI;海马	70
自然科学基金2012	医学部	面上项目	微小RNA-30e调控紊乱在精神分裂症中的作用	徐勇	山西医科大学	关键词：精神分裂症;微小RNA-30e;调控紊乱;转基因小鼠;追踪研究	80
自然科学基金2012	医学部	优秀青年科学基金项目	精神分裂症的分子遗传学研究	岳伟华	北京大学	关键词：精神分裂症;全基因组关联研究;第三阶段验证;外显子测序;功能研究	100
自然科学基金2012	医学部	面上项目	EPAC基因突变对突触传递在自闭症社会行为活动中的调控作用和机理	舒晓刚	华中科技大学	关键词：自闭症;突触传递;基因突变;Epac;Svb2	70
自然科学基金2012	医学部	青年科学基金项目	多巴胺β-羟化酶基因与注意缺陷多动障碍及其候选内表型的关联研究	吉宁	北京大学	关键词：注意缺陷多动障碍;基因多态性;血浆多巴胺 β-羟化酶活性;关联;内表型	23
自然科学基金2012	医学部	面上项目	孤独症相关16p13.11拷贝数变异的功能分析及相应斑马鱼模型的建立和研究	李强	复旦大学	关键词：孤独症;拷贝数变异;斑马鱼;动物模型;行为	80
自然科学基金2012	医学部	国际(地区)合作与交流项目	了解中国精神分裂症人群的遗传学结构	贺林	上海交通大学	关键词：精神分裂症：核心家系：关联分析：全基因组关联分析；	180

自然科学基金2012	医学部	国际(地区)合作与交流项目	遗传与儿童期环境因素对精神分裂症患病风险及保护作用的脑机制研究	张岱	北京大学	关键词：精神分裂症；认知功能；儿童期环境因素；神经影像学；遗传学	180
自然科学基金2012	医学部	国际(地区)合作与交流项目	精神分裂症发展的表观遗传学生物标记物	赵靖平	中南大学	关键词：表观遗传学；前驱症状；精神分裂症；；	180
自然科学基金2012	医学部	重大研究计划	精神分裂症工作记忆障碍相关易感基因的功能研究	张岱	北京大学	关键词：精神分裂症;工作记忆损害;全基因组关联研究;易感基因;神经环路	300
自然科学基金2012	医学部	面上项目	转录因子Bhlhb2在ADHD中的调节网络研究	吴丽慧	浙江医学高等专科学校	关键词：注意缺陷障碍;BDNF;Bhlhb2	80
自然科学基金2012	医学部	国际(地区)合作与交流项目	精神分裂症miRNA表达特征的识别以及miRNA基因单核苷酸多态与精神分裂症易感性关联的研究	李克深	广东医学院	关键词：精神分裂症;微小RNA;转录组;单核苷酸多态	30
自然科学基金2012	医学部	面上项目	首发未服药精神分裂症患者治疗前后脑影像及DNA甲基化与基因表达研究	陈晓岗	中南大学	关键词：精神分裂症;抗精神病药物;甲基化;基因表达;脑影像	70）
自然科学基金2012	医学部	面上项目	NOV 基因在生物钟调控及躁郁症发病机理中的作用与机制研究	杨树长	同济大学	关键词：NOV基因;生物钟;躁郁症	70
自然科学基金2013	生命科学部	面上项目	基于miRNAs和谷氨酸神经递质系统的精神分裂症分子致病机制研究	马　捷	西安交通大学	遗传学与生物信息学	80
自然科学基金2013	生命科学部	面上项目	5-羟甲基胞嘧啶对成体神经干细胞和神经发生的表观遗传学调控研究	李学坤	浙江大学	遗传学与生物信息学	85
自然科学基金2013	生命科学部	面上项目	下丘脑Sonic hedgehog的转录调控网络研究	赵　丽	天津医科大学	遗传学与生物信息学	80
自然科学基金2013	生命科学部	面上项目	中老年人认知功能的全基因组关联分析的双生子研究	张东峰	青岛大学	神经科学认知科学与心理学	85
自然科学基金2013	生命科学部	面上项目	miRNA与CRF受体亚型调控应激相关障碍易感性	潘　芳	山东大学	神经科学认知科学与心理学	80
自然科学基金2013	生命科学部	面上项目	ErbB信号通路调节精神分裂症病理病症发生的髓鞘机制研究	陶艳梅	杭州师范大学	神经科学认知科学与心理学	97
自然科学基金2013	生命科学部	面上项目	MiRNA在大脑脂代谢过程以及老年性痴呆病理过程中的作用机制	刘　强	中国科学技术大学	神经科学认知科学与心理学	96
自然科学基金2013	生命科学部	面上项目	长链非编码RNA在病理性情感记忆形成中的作用及其表观遗传机制	史海水	河北医科大学	神经科学认知科学与心理学	90
自然科学基金2013	生命科学部	青年基金项目	孤独症易感基因GRIN2B在神经元突触可塑性形成的功能研究	许晓娟	中南大学	遗传学与生物信息学	20
自然科学基金2013	生命科学部	青年基金项目	多巴胺基因多态性和心理压力对学习动机影响的交互作用研究	刘阳阳	南京大学	遗传学与生物信息学	25
自然科学基金2013	生命科学部	青年基金项目	神经限制性沉默因子REST对逆转录转座子LINE-1转座的表观遗传学调控	范彦涛	同济大学	遗传学与生物信息学	24
自然科学基金2013	生命科学部	青年基金项目	微管解聚相关蛋白Stathmin作为恐惧症治疗潜在分子靶点的机制研究	崔　颖	中国人民解放军第四军医大学	神经科学认知科学与心理学	24
自然科学基金2013	生命科学部	青年基金项目	双相障碍相关基因ANK3和LAMC1对神经突触的形成及稳定性的影响	朱　明	云南大学	神经科学认知科学与心理学	25
自然科学基金2013	生命科学部	青年基金项目	探讨小鼠杏仁核区域ErbB4特异性敲减导致社交能力异常的作用机制	周　颖	上海交通大学	神经科学认知科学与心理学	20
自然科学基金2013	生命科学部	青年基金项目	多巴胺系统基因多态性与工作记忆的脑网络的关系研究	李　瑾	中国科学院自动化研究所	神经科学认知科学与心理学	28
自然科学基金2013	生命科学部	地区基金项目	新疆维吾尔族及汉族双相障碍患者冲动攻击行为基因与社会心理因素的交互研究	邹韶红	新疆维吾尔自治区人民医院	神经科学认知科学与心理学	49
自然科学基金2013	医学部	面上项目	miR-212/sema4G调控中脑边缘多巴胺亚群神经元靶向投射与甲基苯丙胺致心理渴求关系的研究	孙晋浩	山东大学	关键词：microRNA；mesolimbic；神经发育；药物成瘾；	70
自然科学基金2013	医学部	面上项目	精神分裂症不同病同卵双生子全基因组甲基化和脑影像学研究	唐劲松	中南大学	关键词：精神分裂症；双生子；甲基化；神经影像；	70
自然科学基金2013	医学部	青年科学基金项目	长链非编码RNA-LINC00461与精神分裂症发生的相关性及作用机制研究	金春慧	南京医科大学	关键词：精神分裂症；长链非编码RNA；LINC00461；基因敲减；小鼠模型	23
自然科学基金2013	医学部	青年科学基金项目	miR-211通过NR2B致注意缺陷多动障碍学习记忆损伤的机制研究	洪琴	南京医科大学	关键词：miR-211；NR2B；注意缺陷多动障碍；学习记忆；机制	23
自然科学基金2013	医学部	青年科学基金项目	幼龄期音乐暴露调控的BDNF表观遗传修饰在成年期恐惧记忆中的作用	陈锶	中南大学	关键词：创伤后应激障碍；音乐；恐惧记忆消退；表观遗传学；脑源性神经营养因子	23
自然科学基金2013	医学部	面上项目	Shank3基因缺失致自闭症的纹状体直接、间接通路平衡失调研究	王文挺	中国人民解放军第	关键词：自闭症；纹状体；Shank3；直接通路；间接通路	70
自然科学基金2013	医学部	青年科学基金项目	轻度认知障碍中血清miRNA29与脑磁共振DTI相关性及分子机制	张冰	南京大学	关键词：轻度认知障碍；miRNA29；弥散张量成像；分子机制；	23
自然科学基金2013	医学部	地区科学基金项目	精神分裂症相关攻击行为的遗传影像学机制	李存保	内蒙古医科大学	关键词：精神分裂症；精神病学；攻击行为；神经生物学；影像	49
自然科学基金2013	医学部	面上项目	NP65在认知功能及轻度认知障碍中的作用与机制的研究	袁琼兰	同济大学	关键词：neuroplastin65；认知功能；神经网络连接；轻度认知障碍；	70
自然科学基金2013	医学部	面上项目	创伤后应激障碍恐惧环路的分子遗传学研究	张伟	四川大学	关键词：创伤后应激障碍；恐惧环路；结构脑影像；功能脑影像；分子遗传学	65
自然科学基金2013	医学部	面上项目	孤独症患者突触发育相关基因与大脑网络连接改变的关联研究	黄颐	四川大学	关键词：孤独症；脑影像；脑网络连接；基因；	70
自然科学基金2013	医学部	国际(地区)合作与交流	出生前饥荒暴露增加个体成年后精神分裂症发病风险的生物学机理研究	贺林	上海交通大学	关键词：饥荒；精神分裂症；眼动；基因组学；表观遗传学	7.6
自然科学基金2013	医学部	重大研究计划	双相情感障碍神经环路异常的分子机制：单胺神经递质和生物节律系统的交互作用	李涛	四川大学	关键词：双相情感障碍；神经环路；单胺神经递质；生物节律；交互作用	300
自然科学基金2013	医学部	重大研究计划	DNA甲基化在阿片类药物调控情绪环路功能中的作用及其神经机制	隋南	中国科学院心理研究	关键词：吗啡；表观遗传学；伏隔核；杏仁核；岛叶	70
自然科学基金2013	医学部	重大研究计划	表观遗传学调控的中央杏仁核GABA神经环路参与慢性疼痛并发的抑郁症	张智	中国科学技术大学	关键词：慢性疼痛；抑郁症；表观遗传学；GABA神经环路；光遗传学	70
自然科学基金2013	医学部	重大研究计划	Dysbindin-1在海马成体神经发生和环路形成中的作用机制研究	李巍	中国科学院遗传与发	关键词：海马；成体神经发生；精神分裂症；记忆环路；dysbindin-1	80

自然科学基金2013	医学部	重大研究计划	抑郁症快感缺失的神经环路基础及其与多巴胺系统基因多态性关联机制	谢春明	东南大学	关键词：抑郁症；快感缺失；神经环路；基因多态性；脑功能连接	60
自然科学基金2013	医学部	面上项目	SHANK3基因缺失/点突变与孤独症表型关系的研究及机制探讨	徐秀	复旦大学	关键词：孤独症；SHANK3；基因突变；表型；模式动物	70
自然科学基金2013	医学部	国家杰出青年科学基金	抑郁症发生机制与防治研究	朱心红	南方医科大学	关键词：抑郁症；星形胶质细胞；三磷酸腺苷；P2X2受体；	200
自然科学基金2013	医学部	青年科学基金项目	EGR3基因在精神分裂症网络调控中的分子机制研究	张蕊	西安交通大学	关键词：精神分裂症；早期生长反应基因3；分子机制；；	23
自然科学基金2013	医学部	青年科学基金项目	孤独症易感基因NRXN1突变的功能研究	刘亚兰	中南大学	关键词：孤独症；NRXN1；突触发生；动物模型；	23
自然科学基金2013	医学部	重点项目	儿童孤独症的神经环路机制研究	夏昆	中南大学	关键词：孤独症；神经环路；CNTN4；CNTNAP2；AMPD1	290
自然科学基金2013	医学部	青年科学基金项目	尼古丁成瘾易感基因甲基化及多态性位点的基因表达调控研究	崔雯妍	浙江大学	关键词：尼古丁成瘾；表观遗传；甲基化；SNP；	23
自然科学基金2013	医学部	青年科学基金项目	精神分裂症新靶点"少突胶质细胞NMDA-R"在白质损伤中的作用及机制探讨	修芸	重庆医科大学	关键词：精神分裂症；少突胶质细胞；NMDA受体；体视学；分子生物学	23
自然科学基金2013	医学部	青年科学基金项目	重性抑郁障碍患者情感和记忆环路共享节点的异常及其与CREB1基因多态性关系的研究	孔令韬	中国医科大学	关键词：重性抑郁障碍；情感环路；记忆环路；cAMP反应元件结合蛋白；单核苷酸多态性	23
自然科学基金2013	医学部	面上项目	以模式动物果蝇解析精神分裂症易感基因Vein(Neuregulin)的功能及相关病理机制	平勇	上海交通大学	关键词：果蝇；基因；精神分裂症；Vein；行为学	16
自然科学基金2013	医学部	面上项目	5-HT介导AC-cAMP通路多基因突变与抑郁症的关系	李恒芬	郑州大学	关键词：抑郁症；AC-cAMP通路；基因突变；单核苷酸多态性；	70
自然科学基金2013	医学部	面上项目	TCF7L2和SLC30A8基因在抗精神病药物引起代谢综合征中的遗传作用机制	吴仁容	中南大学	关键词：精神分裂症；奥氮平；代谢综合征；TCF7L2；SLC30A8	70
自然科学基金2013	医学部	面上项目	GABRB2基因羟甲基化修饰与精神分裂症的相关性研究	赵存友	南方医科大学	关键词：精神分裂症；GABRB2基因；转录调控；表观遗传细胞和小鼠模型；DNA甲基化和羟甲基化	70
自然科学基金2013	医学部	面上项目	海洛因成瘾的表观基因组学研究	段世伟	宁波大学	关键词：海洛因；DNA甲基化；组蛋白修饰；成瘾；表观基因组学	70
自然科学基金2013	医学部	海外及港澳学者合作研	青少年日间过度嗜睡的生物学标记和HLA基因型研究	荣润国	四川大学	关键词：睡眠障碍；日间过度嗜睡；青少年；人类白细胞抗原；生物学标记	20
自然科学基金2013	医学部	海外及港澳学者合作研	Erbin对焦虑和忧郁样行为的调节作用及其机制研究	梅林	南方医科大学	关键词：焦虑；抑郁；电生理；动物行为；GABA	200
自然科学基金2013	医学部	地区科学基金项目	新疆维吾尔族精神分裂症新发生的拷贝数变异（de novo CNV）研究	伊琦忠	新疆医科大学	关键词：精神分裂症；新发生的拷贝数；维吾尔族；；	49
自然科学基金2013	医学部	面上项目	基于NIPBL基因剔除致Cornelia de Lange综合征的认知障碍机制研究	邹朝春	浙江大学	关键词：Cornelia de Lange syndrome；NIPBL；认知障碍；NMDA受体；AMPA受体	70
自然科学基金2013	医学部	面上项目	"睡眠-觉醒"节律偏移在NR2B介导的老年POCD中的作用	顾小萍	南京大学	关键词：术后认知功能障碍；"睡眠-觉醒"节律；N-甲基-D-天冬氨酸受体2B亚单位；α-氨基-3-羟基-5-甲基-4-异恶唑受体；转录因子cAMP反应元件结合蛋白	70
自然科学基金2013	医学部	青年科学基金项目	Y染色体单倍群与注意缺陷多动障碍的关联研究	刘璐	北京大学	关键词：注意缺陷多动障碍；遗传多态；Y染色体单倍群；内表型；关联	23
自然科学基金2013	医学部	面上项目	抽动秽语综合征相关的染色体易位核型（1q43;5q21)断裂点区域候选基因鉴定及其分子遗传学的研究	刘世国	青岛大学	关键词：抽动秽语综合症；染色体易位；断裂点；传递不平衡；二代测序	70
自然科学基金2013	医学部	面上项目	卒中后抑郁患者小脑影像遗传学改变及电针的干预作用	隋汝波	辽宁医学院	关键词：卒中后抑郁；核磁共振；小脑；电针；基因多态性	70
自然科学基金2013	医学部	面上项目	慢性缺陷型精神分裂症外周免疫系统分子遗传与表观遗传特征研究	张向荣	东南大学	关键词：慢性缺陷型精神分裂症；免疫系统；分子遗传；表观遗传；	70
自然科学基金2013	医学部	青年科学基金项目	瘦素受体酪氨酸磷酸化位点在情绪行为调控中的作用和信号传导机制研究	郭明	滨州医学院	关键词：瘦素受体；抑郁；焦虑；信号传导；基因敲入小鼠	23
科技部2012		973项目*	儿童孤独症的遗传基础及其致病的机制研究	夏 昆	中南大学		1800
科技部2013		973项目*	重度抑郁症遗传与神经生物学基础及干预研究	陈建国	华中科技大学		1200
						total	**10050.6**

100.5 million RMB

Equivalent to 16.75 M USD

*The Ministry of Science and Technology does not provide inormation concerning monetary allotments for 973 grants to the public, but inidividual projects are usually funded at the level of approximately 30 million RMB for five years. Numbers listed in the last column are estimates for funding (RMB) from these grants for the three-year period 2012 - 2014.

Numbers listed in the last column for NSFC grants (自然科学基金) are total monetary allotments for the funding period of each grant, typically 3-4 years.