OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

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|  |
| --- |
| NAME: Sullivan, Patrick |
| eRA COMMONS USER NAME: PFSULLIV |
| POSITION TITLE: Yeargan Distinguished Professor |

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

|  |  |  |  |
| --- | --- | --- | --- |
| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion Date MM/YYYY | FIELD OF STUDY |
| University of Notre Dame, South Bend, IN | BS | 05/1981 | Biology |
| University of California San Francisco, San Francisco, CA | MD | 05/1988 | Medicine |
| University of Pittsburgh, Pittsburgh, PA | Resident | 06/1992 | Psychiatry |
| Christchurch School of Medicine, Christchurch, Otago | Other training | 09/1994 | Psychological Medicine |
| Christchurch School of Medicine, Christchurch, Otago | Fellow | 08/1995 | Genetic epidemiology |

### A. PERSONAL STATEMENT

Dr. Sullivan is a senior psychiatric geneticist who has been leading large international projects since 2004. He co-founded large consortia (PGC-overall, PGC-MDD, GAIN-MDD, Tobacco and Genetics Consortium, AN Genetics Initiative), was on the leadership and writing teams for others (International Schizophrenia Consortium, PGC-schizophrenia), began the Swedish Schizophrenia Study, is the point person for collaborations of the PGC with ENIGMA and CHARGE, and helped catalyze the formation of multiple new PGC groups (OCD, PTSD, anorexia nervosa, and drugs/alcohol). He was co-PI of a trans-disciplinary NHGRI Center of Excellence in Genomic Science (with Prof Pardo-Manuel de Villena), and was the PI of a large eQTL study. He leads a sizable effort to “decode” the molecular and cellular effects of genetic variation implicated in schizophrenia. He has been a programmer and analyst for over 30 years and has considerable experience in “omics” studies in human and mouse. From 2014-2024, he is funded to spend half his time at UNC and half at the Karolinska Institutet in Sweden.

1. Sullivan PF, Daly MJ, O'Donovan M. Genetic architectures of psychiatric disorders: the emerging picture and its implications. Nat Rev Genet. 2012 Jul 10;13(8):537-51. PubMed PMID: [22777127](http://www.ncbi.nlm.nih.gov/pubmed/22777127/); PubMed Central PMCID: [PMC4110909](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4110909/).
2. Ripke S, Wray NR, Lewis CM, Hamilton SP, Weissman MM, et al. A mega-analysis of genome-wide association studies for major depressive disorder. Mol Psychiatry. 2013 Apr;18(4):497-511. PubMed PMID: [22472876](http://www.ncbi.nlm.nih.gov/pubmed/22472876/); PubMed Central PMCID: [PMC3837431](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3837431/).
3. Ripke S, O'Dushlaine C, Chambert K, Moran JL, Kähler AK, et al. Genome-wide association analysis identifies 13 new risk loci for schizophrenia. Nat Genet. 2013 Oct;45(10):1150-9. PubMed PMID: [23974872](http://www.ncbi.nlm.nih.gov/pubmed/23974872/); PubMed Central PMCID: [PMC3827979](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3827979/).
4. Biological insights from 108 schizophrenia-associated genetic loci. Nature. 2014 Jul 24;511(7510):421-7. PubMed PMID: [25056061](http://www.ncbi.nlm.nih.gov/pubmed/25056061/); PubMed Central PMCID: [PMC4112379](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4112379/).

### B. POSITIONS AND HONORS

Positions and Employment

|  |  |
| --- | --- |
| 1995 - 1996 | Senior lecturer, Department of Psychological Medicine, Christchurch School of Medicine, Christchurch |
| 1996 - 2002 | Associate Professor, Virginia Institute for Psychiatric & Behavioral Genetics, Virginia Commonwealth University, Richmond, VA |
| 2002 - 2003 | Professor, Virginia Institute for Psychiatric & Behavioral Genetics, Virginia Commonwealth University, Richmond, VA |
| 2003 - 2007 | Professor, Departments of Genetic and Psychiatry, University of North Carolina, Chapel Hill, NC |
| 2007 -  | Distinguished Professor, Departments of Genetics and Psychiatry, University of North Carolina, Chapel Hill, NC |
| 2014 -  | Professor, Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm |

Other Experience and Professional Memberships

|  |  |
| --- | --- |
| 2007 -  | Lead PI, Psychiatric Genomics Consortium |
| 2011 - 2013 | Scientific advisory board, Schizophrenia Research Forum |
| 2012 -  | International advisory board, iPSYCH |
| 2012 - 2018 | Board of directors, International Society of Psychiatric Genetics |

Honors

|  |  |
| --- | --- |
| 1981 | Magna Cum Laude, University of Notre Dame |
| 1988 | "Outstanding" graduate (top 10% of class), University of California, San Francisco |
| 1991 | Laughlin Fellow, American College of Psychiatrists |
| 1993 | Glaxo Young Investigator Award, RANZCP |
| 1994 | Organon Research Award, Australasian Society for Psychiatric Research |
| 2011 | Fellow, American Association for the Advancement of Science |
| 2012 | V. Sagar Sethi Award, Psychiatric Foundation of North Carolina |
| 2014 | Lieber Prize for Outstanding Achievement in Schizophrenia Research, Brain & Behavior Research Foundation |

### C. Contribution to Science

1. Psychiatric Genomics Consortium (PGC). Dr Sullivan a co-founder and lead PI of the PGC. The PGC, now in its 8th year, is the largest and arguably the most successful collaboration in the history of psychiatry. The PGC has 800+ investigators, 9 disorder groups, 400,000+ subjects in analysis, and 4e12 genotypes. Crucially, the PGC is a mature consortium: highly focused, extremely functional, and producing fundamental knowledge about the genetic basis of psychiatric disorders (along with new methods to extract knowledge). The PGC has published major papers in Nature Genetics, Nature Neuroscience, Lancet, and Molecular Psychiatry plus a landmark paper in Nature where we discovered 108 genome-wide significant loci for SCZ (one of NIMH Director Insel’s top five findings for 2014).
	1. Cichon S, Craddock N, Daly M, Faraone SV, Gejman PV, et al. Genomewide association studies: history, rationale, and prospects for psychiatric disorders. Am J Psychiatry. 2009 May;166(5):540-56. PubMed PMID: [19339359](http://www.ncbi.nlm.nih.gov/pubmed/19339359/); PubMed Central PMCID: [PMC3894622](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3894622/).
	2. Large-scale genome-wide association analysis of bipolar disorder identifies a new susceptibility locus near ODZ4. Nat Genet. 2011 Sep 18;43(10):977-83. PubMed PMID: [21926972](http://www.ncbi.nlm.nih.gov/pubmed/21926972/); PubMed Central PMCID: [PMC3637176](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3637176/).
	3. Ripke S, Wray NR, Lewis CM, Hamilton SP, Weissman MM, et al. A mega-analysis of genome-wide association studies for major depressive disorder. Mol Psychiatry. 2013 Apr;18(4):497-511. PubMed PMID: [22472876](http://www.ncbi.nlm.nih.gov/pubmed/22472876/); PubMed Central PMCID: [PMC3837431](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3837431/).
	4. Biological insights from 108 schizophrenia-associated genetic loci. Nature. 2014 Jul 24;511(7510):421-7. PubMed PMID: [25056061](http://www.ncbi.nlm.nih.gov/pubmed/25056061/); PubMed Central PMCID: [PMC4112379](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4112379/).
2. Genomic Knowledge of Schizophrenia. (a) Dr Sullivan is a core part of the PGC schizophrenia working group. (b) Swedish Schizophrenia Study (S3). Dr Sullivan is the lead PI of S3. S3 is arguably the largest and best-characterized schizophrenia sample currently in existence with GWAS, CNVs, exome chip, and exome sequencing on 5000 schizophrenia cases and 6500 controls. (c) CATIE. Dr Sullivan led the genomic analyses of the CATIE study.
	1. Ripke S, O'Dushlaine C, Chambert K, Moran JL, Kähler AK, et al. Genome-wide association analysis identifies 13 new risk loci for schizophrenia. Nat Genet. 2013 Oct;45(10):1150-9. PubMed PMID: [23974872](http://www.ncbi.nlm.nih.gov/pubmed/23974872/); PubMed Central PMCID: [PMC3827979](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3827979/).
	2. Purcell SM, Moran JL, Fromer M, Ruderfer D, Solovieff N, et al. A polygenic burden of rare disruptive mutations in schizophrenia. Nature. 2014 Feb 13;506(7487):185-90. PubMed PMID: [24463508](http://www.ncbi.nlm.nih.gov/pubmed/24463508/); PubMed Central PMCID: [PMC4136494](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4136494/).
	3. Szatkiewicz JP, O'Dushlaine C, Chen G, Chambert K, Moran JL, et al. Copy number variation in schizophrenia in Sweden. Mol Psychiatry. 2014 Jul;19(7):762-73. PubMed PMID: [24776740](http://www.ncbi.nlm.nih.gov/pubmed/24776740/); PubMed Central PMCID: [PMC4271733](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4271733/).
	4. Biological insights from 108 schizophrenia-associated genetic loci. Nature. 2014 Jul 24;511(7510):421-7. PubMed PMID: [25056061](http://www.ncbi.nlm.nih.gov/pubmed/25056061/); PubMed Central PMCID: [PMC4112379](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4112379/).
3. Genomic Knowledge of Major Depressive Disorder (MDD). (a) Dr Sullivan chairs the PGC MDD working group. (b) GAIN MDD Study. Dr Sullivan is the lead PI of was the lead PI of this early GWAS of MDD. (c) Dr Sullivan has championed alternative approaches to unraveling the complexity of MDD (via heterogeneity analyses and the study of postpartum depression).
	1. Sullivan PF, Neale MC, Kendler KS. Genetic epidemiology of major depression: review and meta-analysis. Am J Psychiatry. 2000 Oct;157(10):1552-62. PubMed PMID: [11007705](http://www.ncbi.nlm.nih.gov/pubmed/11007705/).
	2. Sullivan PF, de Geus EJ, Willemsen G, James MR, Smit JH, et al. Genome-wide association for major depressive disorder: a possible role for the presynaptic protein piccolo. Mol Psychiatry. 2009 Apr;14(4):359-75. PubMed PMID: [19065144](http://www.ncbi.nlm.nih.gov/pubmed/19065144/); PubMed Central PMCID: [PMC2717726](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2717726/).
	3. Wray NR, Pergadia ML, Blackwood DH, Penninx BW, Gordon SD, et al. Genome-wide association study of major depressive disorder: new results, meta-analysis, and lessons learned. Mol Psychiatry. 2012 Jan;17(1):36-48. PubMed PMID: [21042317](http://www.ncbi.nlm.nih.gov/pubmed/21042317/); PubMed Central PMCID: [PMC3252611](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3252611/).
	4. Ripke S, Wray NR, Lewis CM, Hamilton SP, Weissman MM, et al. A mega-analysis of genome-wide association studies for major depressive disorder. Mol Psychiatry. 2013 Apr;18(4):497-511. PubMed PMID: [22472876](http://www.ncbi.nlm.nih.gov/pubmed/22472876/); PubMed Central PMCID: [PMC3837431](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3837431/).
4. Mechanisms underlying antipsychotic side-effects. Dr Sullivan has pursued this using human (clozapine-induced agranulocytosis) and mouse studies.
	1. Crowley JJ, Adkins DE, Pratt AL, Quackenbush CR, van den Oord EJ, et al. Antipsychotic-induced vacuous chewing movements and extrapyramidal side effects are highly heritable in mice. Pharmacogenomics J. 2012 Apr;12(2):147-55. PubMed PMID: [21079646](http://www.ncbi.nlm.nih.gov/pubmed/21079646/); PubMed Central PMCID: [PMC3117923](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3117923/).
	2. Crowley JJ, Kim Y, Szatkiewicz JP, Pratt AL, Quackenbush CR, et al. Genome-wide association mapping of loci for antipsychotic-induced extrapyramidal symptoms in mice. Mamm Genome. 2012 Jun;23(5-6):322-35. PubMed PMID: [22207321](http://www.ncbi.nlm.nih.gov/pubmed/22207321/); PubMed Central PMCID: [PMC3356790](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3356790/).
	3. Goldstein JI, Jarskog LF, Hilliard C, Alfirevic A, Duncan L, et al. Clozapine-induced agranulocytosis is associated with rare HLA-DQB1 and HLA-B alleles. Nat Commun. 2014 Sep 4;5:4757. PubMed PMID: [25187353](http://www.ncbi.nlm.nih.gov/pubmed/25187353/); PubMed Central PMCID: [PMC4155508](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4155508/).

Complete List of Published Work in My Bibliography:
<http://www.ncbi.nlm.nih.gov/myncbi/patrick.sullivan.2/bibliography/40387703/public/?sort=date&direction=ascending>

### D. RESEARCH SUPPORT

Ongoing Research Support

2014/10/01-2024/09/30

D0886501, Swedish Research Council

Sullivan, Patrick (PI)

Establishing the KI Psychiatric Genomics Institute

Role: PI

2014/09/19-2018/06/30

R01 MH105472-02, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

Decoding schizophrenia-From GWAS to functional regulatory variants

Role: PI

2014/07/01-2016/06/30

R21 MH102814-01, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

The schizophrenia candidate gene MIR137: functional studies in mouse

Role: PI

2012/07/06-2016/04/30

R01 MH095992-04, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

Identifying Biomarkers for Post-Partum Depression in African-American Women

Role: PI

2012/05/10-2016/03/31

U01 MH094421-04, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

1/4 Psychiatric GWAS Consortium: Genomic Follow-up Next-Gen Seq & Genotyping

Role: PI

2006/04/01-2015/07/31

R01 MH077139-06, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

1/2 A Large-Scale Schizophrenia Association Study in Sweden

Role: PI

2012/05/01-2015/04/30

R01 MH097281-03, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

2/2-Cis & Trans-Data Integration to Find Mechanisms Causing Psychiatric Disorders

Role: PI

2012/04/01-2015/03/31

R21 MH097173-02, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

Biomarkers of olanzapine-induced weight gain in mice

Role: PI

Completed Research Support

2013/02/07-2014/12/31

R21 MH099370-02, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

The MIR137 region in schizophrenia: genomics, variant discovery & association

Role: PI

2007/09/29-2012/02/29

R01 MH077139-03, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

A Large-Scale Schizophrenia Association Study in Sweden

Role: PI

2008/02/08-2010/11/30

R01 MH080403-02, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

2/2 A genome-wide association study to detect genetic variation for schizophrenia

Role: PI

2008/09/30-2010/08/31

U01 MH085520-01, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

1/5-The Psychiatric GWAS Consortium: Integrated & Coordinated GWAS Meta-Analyses

Role: PI

2004/09/01-2007/02/28

R01 AI056014-02, National Institute of Allergy and Infectious Diseases (NIAID)

SULLIVAN, PATRICK F (PI)

Microarrays & Proteomics in MZ Twins Discordant for CFS

Role: PI

2001/08/03-2006/07/31

R01 CA085739-04, National Cancer Institute (NCI)

SULLIVAN, PATRICK F (PI)

Genetic & Environment Determinants Of Smoking Cessation

Role: PI

1995/09/30-2003/07/31

U19 AI038429-05, National Institute of Allergy and Infectious Diseases (NIAID)

SULLIVAN, PATRICK F (PI)

Population Based Twin Study Of Chronic Fatigue Syndrome

Role: PI

1999/12/01-2003/05/23

R01 MH059160-03, National Institute of Mental Health (NIMH)

SULLIVAN, PATRICK F (PI)

Detecting Susceptibility Loci For Recurrent Depression

Role: PI