

Mariam Mohammed Ali AlEissa

Saudi Center of Disease Control and prevention, Riyadh, KSA • oo 966 536293222 -
maleissa@mit.edu , mmaleissa@moh.gov.sa

OVERVIEW

Geneticist interested in the genetics of complex disorders. Trained to analyze data on individual and **population genetics** levels using **bioinformatics** tools to identify the genetic variations involved in disease etiology. Aim to identify disease mechanisms through functional biology, gene editing, and pathway analysis, to facilitate understanding genetic epidemiology associated with specific phenotypes on a population scale, and to implement **precision medicine**. Passionate about using **innovative strategies** and **leadership** skills to introduce **genetic engineering** applications in health care to create a disease-free future. Amassed years of professional experience gained through working for the Ministry of Health in Saudi Arabia. Participated in many notable publications and conferences pertaining to my research. In addition, professional **artist** and founder of Non-profit organization (@saudisignatures).

EMPLOYMENT

Innovation consultant

Government semi-government and private sector **(confidential)** 2021-present

Adjunct Assistant Professor 2020-present

- *College of Medicine at Alfaisal University.*

Laboratory Director 2018–present
Molecular Genetics Department, Public Health Authority (PHA), Riyadh, Saudi Arabia.

- Developed the "Laboratory Scope of Services and Policy"
- Create the National Saudi panel for metabolic and haematological disease.
- Part of the initiative to develop the genetic laboratory in CDC.

Current Projects

Time	Role	Project title
2020-Present	PI	Genetics, transcriptomics and immune mediated determinants characterization of patient with COVID19.
2020-Present	PI	Perceptions of Saudis towards participating in COVID19 Convalescent Plasma Clinical Trial.
2020-Present	PI	Genetic profile effect on pre-marriage partner choice.
2020-Present	PI	National molecular genetic for the disorders detected by Newborn Screening Program (NBS).

Mariam Mohammed Ali AlEissa

Researcher 2019–2020
• *Grouping Laboratory, McGovern Institute for Brain Research at MIT, Cambridge, MA.*

Postgraduate Teaching Assistant 2015-present
• Teaching experience: Worked as PGTA and taught physiology, biochemistry, cell biology, and bioinformatics.

Geneticist 2012–2013
Cytogenetic Department, Riyadh Central Hospital, Riyadh, Saudi Arabia

- Assigned as the safety officer on cytogenetic infuse safety measures
- Monitored the infection control material safety data sheets
- Workshops attended:
 - Power of Bioinformatics, Center of Excellence in Genomic Medicine, Jeddah, Saudi Arabia, November 24–25, 2013
 - Application of Microarray, Center of Excellence in Genomic Medicine, Jeddah, Saudi Arabia, November 24–25, 2013

Laboratory Technologist 2006–2010
Ministry of Health, Al-Khafji Central Hospital, Al-Khafji, Saudi Arabia

- Filled the position of acting Laboratory supervisor.
- Contributed to the development of the "Laboratory Manual of Policy and Procedure".

Internship 2005–2006
Riyadh Central Hospital, Riyadh, Saudi Arabia

- Trained completed in: in Malaria Department, Virology Department, Serology, Chemistry Department, Nuclear Medicine Department, Bacteriology Department and Blood Bank.

King Fahad Medical City, Riyadh, Saudi Arabia

- Trained completed in: Cyto-genetics, Immunology, Histopathology (including cytology) and Haematology.

EDUCATION

Advanced Certificate for Executives in Management, Innovation & Technology (ACE) (MIT Sloan Executive) July 2019-February, 2020.

Postdoctoral Fellow 2019–2020
• *Guoping Laboratory, McGovern Institute for Brain Research at MIT, Cambridge, MA*

- *Affiliated with the Stanley Centre for Psychiatric Research, Broad Institute of MIT and Harvard, Cambridge, MA*
- *Visiting investigator at the department of Analytic and Translational Genetics Unit, Massachusetts General Hospital, Boston, MA*

Research focus: Genetic engineering (e.g., designing a mutant mouse using CRISPR cas). Using bioinformatics methods to identify genetic variations of complex diseases and identify pathways involved in disease aetiology.

- Courses completed in:

Mariam Mohammed Ali AlEissa

- Working with Mice in Research Settings
- Reducing Pain and Distress in Laboratory Mice and Rats
- Antibody Production in Animals
- Aseptic Surgery
- Leadership and Innovation, MIT professional development program, June 27–August 22, 2019.
- Workshops attended:
 - Interpreting Genomes for Rare Disease Variants and Gene Interpretation, Broad Institute, May 15–16, 2019
 - Leading with Vision and Grit, Graduate Women at MIT Leadership Conference, April 26, 2019
 - Professional Branding Effective Communication Skills Grit, Graduate Women at MIT Leadership Conference, April 25, 2019

PhD in Molecular Genetics of Complex Traits

2014–2018

Molecular Psychiatry Laboratory, University College of London (UCL), London, UK

- Thesis title: "Identifying rare genetic variants associated with schizophrenia and bipolar disorder"
- Analyzed a large sample cohort
- Identified a number of variants and introduced these mutations into cells to follow their effects on disease etiology
- Adapted existing knowledge on statistics, genetic epidemiology, and bioinformatics
- Analyzed next-generation sequencing and RNA-seq data
- Supervised a number of masters and junior PhD students in the molecular psychiatry laboratory
- Courses completed:
 - Genetic Analysis of Mendelian and Complex Disorders, Wellcome Genome Campus, Hinxton, UK, July 18–24, 2018
 - Research Methods, Department of Infection and Population Health, UCL, London, UK, September 7–11, 2015
 - Genetic Epidemiology in Genome-wide Association Studies, UCL, London, UK, September 2–5, 2014
- Workshop attended:
 - Lab Techniques in Mammalian Cell Biology, UCL, London, UK, July 6–8, 2015

MSc in Medical Genetics

2011–2012

Glasgow University, Glasgow, UK

- Dissertation title: "Susceptibility to schizophrenia in 22q11 deletion syndrome genetic/epigenetic factors"
- Courses completed:
 - Molecular genetics
 - Cytogenetics

Mariam Mohammed Ali AlEissa

- Bio-chemical genetics (metabolic)
- Clinical skills (genetic counseling)
- Case investigations
- Forensic DNA analysis
- Integrated case studies
- Research skills in a laboratory-based or library/clinical data-based investigation

Diploma in Health Care Management

2011-2012

Luton International College, Luton, UK

- Subjects:
 - Managerial skills to run a round-the-clock operation in the health services according to NHS regulations
 - Managing specific departments
 - Supervising multiple departments or managing an entire hospital that includes financial matters and integrating new regulations and technologies into health institutes
 - Leadership skills
 - Planning committees
 - Effective communication and motivational skills.
 - Improving managerial interpersonal and decision-making skills
 - Building a network between executive managers, administrators, and other healthcare providers.

Bachelor in Clinical Laboratory Sciences

1999–2005

Applied Medical Sciences, King Saud University, Riyadh, Saudi Arabia

- Dissertation title: "Laboratory diagnosis of systemic lupus erythematosus"
- Subjects included science and medicine with the aim of implementing this knowledge in health care and research.

AWARDS AND NOMINATIONS

- **2019:** Awarded the Ibn Khaldun–MIT Fellowship for Saudi women, nominated and funded by the King Abdulaziz City for Science and Technology.
- **2018:** Prince Khaled Al Faisal moderation prize for best non-profit organization, Saudi Signatures.
- **2017:** Nominated to represent Saudi Arabia in the global diversity committee meeting at the International Society of Psychiatric Genetics, October 16, 2017.
- **2017:** Honored by HRH Prince Mohammed bin Nawaf al Saud for outstanding academic achievements.
- **2016:** Certificate of appreciation for presenting the 2030 Saudi vision for the Ministry of Health, hosted by the Saudi ambassador HRH Prince Mohammed bin Nawaf al Saud and the Saudi Arabian Cultural Bureau.
- **2008:** Employee of the Month, Ministry of Health, Al-Khafji Central Hospital.

PAPERS (ORCID ID 0000-0002-2355-4036)

- Genome-wide association study of over 40,000 bipolar disorder cases provides novel biological insights, submitted, 26th Aug, Nature Genetics and bioRxiv.
- Mapping genomic loci prioritizes genes and implicates synaptic biology in schizophrenia. Submitted, June 29th, Nature Genetics and bioRxiv.
- Genetic characterization of age and polarity at onset in bipolar disorder, submitted August 30th, JAMA Psychiatry.
- Genetic association and functional characterization *MCPH1* gene variation in bipolar disorder and schizophrenia, American journal of medical genetics: Neuropsychiatric genetics, 2019 Mar; 180(4):258-265 [PMID:30859703].
- Rare variant analysis in multiply affected families, association studies and functional analysis suggest a role for the *ITGB4* gene in schizophrenia and bipolar disorder, *Schizophrenia Research*, 2018 Mar ;199:181-188 [PMID: 29526452].
- Exome sequence analysis and follow up genotyping implicates rare *ULK1* variants to be involved in susceptibility to schizophrenia. *Annals of Human Genetics*, 2017 Nov;82(2):88-92. [PMID: 29148569].
- Mutation intolerant genes and targets of *FMRP* are enriched for nonsynonymous alleles in schizophrenia. *American Journal of Medical Genetics, Neuropsychiatric Genetics*, 2017 Oct;174(7):724-731 [PMID:28719003].

CERTIFICATES

- Executive Mini MBA completion of September - October, 2020.
- Executive Program in Strategy and Organization completion of October, 2020.
- Leading Change, December, 2020.
- Entrepreneurship Development Program, January, 2020.
- Executive Certificate in Technology, Operations, and Value Chain Management (MIT Sloan Executive), January, 2020.
 - Managing Complex Technical Projects
 - Systematic Innovation of Products, Processes, and Services
 - Business Process Design for Strategic Management
- Executive Certificate in Strategy and Innovation (MIT Sloan Executive), October, 2019.
 - Leadership by Design: Innovation Process and Culture
 - Innovator's DNA: Mastering Five Skills for Innovative Disruption
 - Corporate Innovation: Strategies for Leveraging Ecosystems
- Executive Certificate in Management and Leadership (MIT Sloan Executive) October, 2019.
 - Leading People at Work: Strategies for Talent Analytics
 - Negotiation for Executives
 - Creating High-Velocity Organizations

CONFERENCES

- World Congress of Psychiatric Genetics, virtual meeting, October 16th–22nd, 2020.
- American Society of Human Genetics, virtual meeting, October 27–30, 2020.
- Attended, World Congress of Psychiatric Genetics, Los Angeles, CA, October 26–31, 2019.
- Panel talk discussion, postdoctoral and graduates retreat, Broad Institute (unconventional collaboration), Broad Institute, Cambridge, MA, October 1, 2019.
- Attended, Precision Medicine 2019: Can AI Accelerate Precision Medicine? (conference), Harvard Medical School, Boston, MA, June 18, 2019.
- Presentation, "Youth and Mental Health 2030 Vision," 4th International Psychiatry Conference, King Saud University, Riyadh, Saudi Arabia, February 21–23, 2019.
- Mentor, "MIT Hacking Medicine," Princess Noura University Convention Centre, Riyadh, Saudi Arabia, November 30, 2018.
- Poster presentation, World Congress of Psychiatric Genetics, Glasgow, UK, October 11–15, 2018.
- Poster presentation, "Genetic Association and Functional Characterization of a Variant in the MCPH1 Gene in Bipolar Disorder and Schizophrenia," World Congress of Psychiatric Genetics, Orlando, FL, October 13–17, 2017.
- Attended, American Society of Human Genetics, Orlando, FL, October 18–21, 2017
- Attended, "Genetic and Functional Association of rs61749465 with Bipolar Disorder and Schizophrenia', European Society of Human Genetics, Copenhagen, Denmark, May 27–30, 2017.
- Attended, Psychiatric Epidemiology Meets Genetics: The Public Health Consequences, World Psychiatry Association meeting, Institute of Psychiatric Phenomics and Genomics and the Department of Psychiatry and Psychotherapy, Ludwig Maximilian University of Munich, Munich, Germany, March 29–April 1, 2016.
- Presentation and poster presentation, mini conference, Department of Psychiatry, UCL, London, UK, January 29, 2016.
- Poster presentation, World Consortium of Psychiatric Genetics, Toronto, Canada, October 16–20, 2015.
- Postgraduate poster presentation, Faculty of Brain Sciences Symposium, UCL, London, UK, February 11, 2015.
- Poster presentation, UCL Neuroscience Symposium, Institute of Education, UCL, London, UK, June 19, 2014.

PROFESSIONAL MEMBERSHIPS

- European Society of Human Genetics (Membership ID #9144)
- International Society of Psychiatric Genetics.
- The American Society of Human Genetics (Membership ID # 533472)
- Scientific research and innovation association.

COMPUTER SKILLS

- Programming skills using: Plink, R, Python, Unix and Linux

Mariam Mohammed Ali AlEissa

LANGUAGES

- Arabic (Fluent), English (Fluent), Spanish (Intermediate) and French (Intermediate)

INTERESTS

I'm a professional artist and the founder of Signatures (@saudisignatures) non-profit organization, a platform for Saudi artists in the UK. I'm also interested in Arabic literature, poetry, sport and volunteer work; I organized big events and conferences.

REFEREES

Available Upon Request.