National Institutes of Health Begins Research Into Health Disparities Among Minority Communities

The new grant program seeks to break new ground studying the effects of social epigenomics on health in minority communities

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The National Institutes of Health will award 10 grants to support social epigenomics research in health disparities. This investigator-initiated research is being funded as part of the Social Epigenomics Research Focused on Minority Health and Health Disparities research program, which seeks to support research to better understand the drivers of health disparities. The National Institute on Minority Health and Health Disparities (NIMHD), part of the National Institutes of Health, will commit $26.2 million over five years, subject to available funds, for nine awards. An additional award under this initiative will be funded by the National Cancer Institute (NCI)—also part of NIH.

Social epigenomics is the study of how social experiences affect the genes and our biology. Our experiences do not alter the genetic code itself; however, social experiences may bring about changes in the various molecules that interact with DNA, determining which genes are switched on or off. Recent studies suggest that social stressors may affect health status through epigenomic modifications of various biological pathways.

Living in disadvantaged neighborhoods with exposure to chemical stressors, violence, discrimination, residential segregation and psychosocial stress, and limited access to healthy foods, can affect a person's ability to stay healthy - becoming barriers to health.

"We are on the cusp of unprecedented research where we are bringing together different fields of science: social science and epigenetics, to help elucidate how social factors affect biology in health disparity populations," said NIMHD Director Eliseo J. Pérez-Stable, M.D.

Research geared toward understanding how epigenomic changes are influenced by social experiences may lead to a better understanding of mechanisms and pathways that may ultimately affect minority health and health disparities.

By identifying epigenetic modifications prior to the onset of disease, it may be possible to tailor interventions to prevent chronic conditions or diseases later in life which may result in better

approaches to disease prevention, and early diagnosis, with the end goal of reducing health disparities.

The award recipients are:

University of Michigan, Ann Arbor
Epigenetic Mediation of Adverse Social Context on Stress Response, Socioemotional Development, and Health in a Population-based Study of Minority and Low SES Children and Adolescents
Colter Mitchell, Ph.D.
1R01MD011716-01 — Researchers will examine whether DNA methylation mediates the effects of adverse social experiences, such as poverty, harsh parenting, family instability and neighborhood disorganization, on biological processes related to stress response and stress-responsive behaviors in children and adolescents.

University of Illinois-Urbana Champaign
Epigenomic Predictors of PTSD and Traumatic Stress in an African American Cohort
Monica Uddin, Ph.D.
1R01MD011728-01 — Researchers will characterize genome wide patterns of leukocyte DNA methylation in African American participants in the Detroit Neighborhood Health Study, a population-based study of mental disorders among adult Detroit residents. Analyzing glucocorticoid receptor regulatory network genes, they will test the effects of social adversity on DNA methylation levels.

University of Michigan, Ann Arbor
Race/Ethnicity, DNA Methylation, and Disparities in Cardiovascular Mortality: NHANES 1999-2002
Belinda L. Needham
1R01MD011721-01 — Researchers will study whether differences in DNA methylation between African Americans, Hispanics/Latinos, and non-Hispanic Whites helps explain why mortality rates for cardiovascular disease are higher among African Americans and how socially-patterned risk factors become physically embodied.

University of Florida, Gainesville
Epigenetic Mechanisms of Emotional/Behavioral Health Among Impoverished African American Youth
Darlene A. Kertes, Ph.D.
1R01MD011727-01 — Researchers will investigate whether environmental stressors, such as racial discrimination and exposure to violence, are associated with DNA methylation and telomere length among low-income, urban minority youth, which can help inform biological mediators of stress effects on emotional/behavioral health.

University of Southern California, Los Angeles
Influence of Prenatal Psychosocial Stressors on Maternal and Fetal Circulating miRNAs
Carrie Breton, Sc.D.

1R01MD011698-01 — Researchers will evaluate whether psychosocial stressors in the maternal environment impact the pattern of expression of maternal and fetal microRNA (miRNA) from low SES Hispanic women and whether the expression of these miRNA can impact critical newborn and early life health outcomes indicative of future health trajectory.

North Carolina State University, Raleigh
Social Adversities, Epigenetics, and the Obesity Epidemic
Cathrine Hoyo, Ph.D.
1R01MD011746-01 — Researchers will explore mechanisms by which social adversity confers risk for obesity in youth among Blacks, Hispanics and Whites and unravel the pathways by which mothers' prenatal stress may alter DNA methylation and influence early development, growth trajectories and childhood obesity.

University of Pittsburgh
Exposure to Violence, Epigenetic Variation, and Asthma in Puerto Rican Children
Juan Carlos Celedon M.D., Dr.PH
1R01MD011764-01 — Researchers will determine how exposure to violence leads to increased risk of asthma and asthma morbidity through altered methylation of genes regulating behavioral, autonomic, neuroendocrine and immunologic responses to stress in Puerto Rican children.

Beckman Research Institute, City of Hope, Duarte, California (NCI-funded)
Epigenetic Damage in Women Living in LA Food Desert Zip Codes Victoria Seewaldt, M.D.
1R01CA220693-01 —Researchers will explore in young Women-of-Color (African-American and Latina/Hispanic-American) living in food-desert zip codes in Los Angeles, whether insulin-resistance promotes epigenetic damage and triple-negative breast cancer (TNBC) risk.

North Carolina Central University, Kannapolis
Molecular Determinants of Social Factors in Prostate Cance
1R01MD012767-01 — Deepak Kumar, Ph.D.
Researchers will analyze circulating microRNAs and stress hormone levels in African American prostate cancer patients living in the Washington D.C., metropolitan area, at different levels of socioeconomic status (SES) and social stress to understand the epigenetic mechanisms modified by social stress that may cause prostate cancer health disparities.

Northwestern University
Understanding Socioeconomic Disparities in Perinatal Risk: The Role of Epigenetic and Transcriptional Regulation in the Placent
1R01MD011749-01 — Gregory Evan Miller, Ph.D.
Researchers will determine the extent to which socioeconomic/psychosocial conditions affect prenatal DNA methylation, miRNA expression, mRNA expression and inflammation, and influence preterm birth and small for gestational age among low SES women.

NIMHD is one of NIH's 27 Institutes and Centers. It leads scientific research to improve minority health and eliminate health disparities by conducting and supporting research; planning, reviewing, coordinating, and evaluating all minority health and health disparities research at NIH; promoting and supporting the training of a diverse research workforce; translating and disseminating research information; and fostering collaborations and partnerships.

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