

Epigenetic Alterations and Stress Among New Mothers and Infants in the Democratic Republic of Congo: A Biocultural Look at the Intergenerational Effects of War

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Our ability to successfully adapt to a constantly changing environment and increasingly complex stressors is one of the ways in which we are distinctively human. There is growing evidence there may be an intermediate mechanism that mediates between the rapidly changing environment and our slowly evolving genome, i.e. epigenetic alterations. A new project based in the Democratic Republic of Congo (DRC) and conducted by UF's Department of Anthropology will investigate epigenetic alterations (chemical modifications to the genome that do not change the underlying DNA sequence, but do affect gene expression) as a possible pathway to developmental plasticity and

adaptation. Professors Connie Mulligan, Lance Gravlee, and Alyson Young and doctoral student Nikki D'Errico will examine epigenetics and socio-cultural measures of stress in one of the most stressful environments today: the eastern DRC, where war has raged for 14 years. This war and the related political-economic instability have far-reaching consequences as a result of widespread material deprivation, increased exposure to psychosocial stressors, and direct physical violence, including systematic rape warfare. Biological samples will be collected and oral history interviews will be conducted with a group of Congolese mothers and newborns to test whether epigenetic alterations mediate the effects of maternal exposure to stressors on fetal development and neonatal health.

The proposed study is the first to investigate epigenetic alterations in humans as a means of modifying gene expression in offspring as a result of trauma to the mother. The idea that violence and stress exposure can create abrupt changes in gene expression in offspring has immediate relevance to global public health issues. This research has the potential to dramatically transform the ways in which we think of adaptation and evolution as well as informing policies to address societal problems. The proposed biocultural approach integrates sophisticated genetic and ethnographic data and emphasizes the strengths of research conducted in a four-field anthropology department.

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