BIOGRAPHICAL SKETCH

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NAME: Roger Christopher McIntosh, Ph.D.

eRA COMMONS USER NAME (credential, e.g., agency login): RMCINTOSH

POSITION TITLE: Assistant Professor

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

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Jacksonville University, Jacksonville, Florida	B.S.	05/2002	Biology
Nova Southeastern University, Fort Lauderdale, Florida	M.S.	05/2005	Neuroscience
Florida Atlantic University, Boca Raton, Florida	M.A.	05/2010	Psychology
Florida Atlantic University, Boca Raton, Florida	Ph.D.	07/2012	Neuropsychology
University of Miami, Miami, Florida	Post-doc	07/2014	Psychoneuroimmunology CV Behavioral Medicine

A. Personal Statement

My program research focuses on three interrelated comorbidities experienced by persons living with the Human Immunodeficiency Virus (HIV). Despite the widespread availability of antiretroviral therapy, HIV+ individuals demonstrate greater cardio-autonomic dysfunction, neurocognitive impairment, and inflammatory immune activation than HIV-negative age matched controls. Moreover, these comorbidity levels are shown to covary with various indices of emotional dysregulation. My approach to this problem predominately involves the use of neuroimaging to study patterns of neural activation, (primarily in cognitive, limbic, and interoceptive networks), during real-time self-regulation. My initial research found electrocortical markers of emotional arousal to be blunted in multiple cohorts of HIV+ women during the cognitive regulation of unpleasant emotions. Subsequently, we showed several indicators of poor cognitive assimilation of emotions relate to cognitive impairment, neuroendocrine dysfunction, and immunosuppression across multiple cohorts. I am currently using functional neuroimaging to study how HIV impacts neural networks supporting the integration and regulation of physiological states, (e.g., heart rate, blood pressure, peripheral inflammation) during interoceptive awareness and mental stress tasks. This work is of importance based upon the disproportionate burden of neurocognitive impairment, cardiovascular disease, chronic inflammation and psychological distress reported in HIV+ individuals. By understanding the contribution of these neural networks to specific aspects of self-regulation and how they function in persons with HIV we will gain a better understanding of how self-regulatory processes and the associated disease comorbidity are perpetuated in persons living with HIV, particularly with advancing age. Moreover, simultaneous or parallel measurement of biomarkers for inflammation, HPA-axis activation, and cardio-autonomic arousal during these behavioral paradigms will allow us to characterize what are ecologically valid neural signatures of 'adaptive' and 'maladaptive' responses to stress. Future applications of this work will involve comparing functional brain changes associated with biobehavioral interventions to reduce psychological distress and related comorbidities in individuals living with HIV.

B. Positions and Honors

President's Research Grant, Nova Southeastern University 2010

Research Award for Minorities and Women Southeastern Psychological Assoc. 2011

APA Minority Fellowship award recipient. Attended Psychology Summer Institute. 2011

Graduate Student Research Award. 2012

Social and Behavioural Science Research Network (SBSRN) Mentoring Fellowship & Travel Award 2013

C. Contribution to Science

Contribution #1 HIV+ women have blunted psychophysiological reactivity to emotional stimuli.

We published a series of studies showing a deficit in electrocortical response to affective cues in HIV positive women (1,2). Based upon these serendipitous findings, we developed an affect regulation paradigm to demonstrate that these deficits extend to the cognitive regulation of affect and are linked to a negative attention bias that occurs milliseconds within being presented an affective stimulus (3). We have also combined psychophysiology-neuroimaging to show reduced theta activity within the anterior cingulate was associated with depression in persons living with HIV.

1- Tartar, J.L., de Almeida, K.E., McIntosh, R.C., Rosselli, M., Nash, A.J. (2012). Emotionally negative pictures increase attention to an immediately subsequent auditory stimulus. International Journal of Psychophysiology. 83, 36–44. PMID: 22015918

2- Tartar, J. L., McIntosh, R. C., Rosselli, M., Widmayer, S. M., & Nash, A. J. (2014). HIV-positive females show blunted neurophysiological responses in an emotion–attention dual task paradigm. Clinical Neurophysiology, 125(6), 1164-1173. PMID: 24405904

3- McIntosh, R. C., Tartar, J. L., Widmayer, S., & Rosselli, M. (2015). Negative Attention Bias and Processing Deficits During the Cognitive Reappraisal of Unpleasant Emotions in HIV+ Women. The Journal of neuropsychiatry and clinical neurosciences. PMID: 25541865

4- Kremer, H., Lutz, F. P., McIntosh, R. C., Dévieux, J. G., & Ironson, G. (2015). Interhemispheric Asymmetries and Theta Activity in the Rostral Anterior Cingulate Cortex as EEG Signature of HIV-Related Depression Gender Matters. Clinical EEG and neuroscience, PMID: 25568149

Contribution #2 The neurocognitive bases of emotion dysregulation and its contribution to HIV disease progression.

Chronic HIV disease results in increased trafficking of peripheral monocytes and cytokines to the central nervous system and this may contribute to the prevalence of neurocognitive deficits and neuropsychiatric complaints (5). We have shown there to be a cognitive vulnerability for depression in persons with HIV Dementia (6). Furthermore, we have linked executive dysfunction to alexithymia, i.e., difficulty identifying and describing feelings in long-term survivors with HIV (7). This study noted cross-sectional associations between the alexithymia trait and poorer neuroendocrine, psychological and HIV disease outcomes. Our longitudinal research further shows longitudinal associations between trait alexithymia and viral load that was mediated by increases in stress, anxiety and depression (8). Our work has also noted an indirect association between alexithymia and HIV disease outcomes via psychosocial processes, i.e., interpersonal functioning, doctor-patient relationship and medication adherence (9).

5- McIntosh, R. C., Rosselli, M., Uddin, L. Q., & Antoni, M. (2015). Neuropathological Sequelae of Human Immunodeficiency Virus and Apathy: A review of neuropsychological and neuroimaging studies. Neuroscience & Biobehavioral Reviews, 55, 147-164. PMID: 25944459

6- McIntosh, R.C., Seay, J., Antoni M., Duran, R., Schneiderman, N. (2013). Cognitive vulnerability for depression in HIV: A Moderated Mediation Model. Journal of affective disorders, 150(3), 908-915. PMID: 23726660

7- McIntosh, R.C., Ironson, G., Antoni, M., Kumar, M., Fletcher, M., Schneiderman, N. (2013). Alexithymia is Linked to Neurocognitive, Psychological, Neuroendocrine, and Immune Dysfunction in Persons Living with HIV. Brain Behavior and Immunity, 36, 165-175. PMID: 24184475

8- McIntosh, R.C., Ironson, G., Antoni, M. et al.. (2017). Psychological Distress Mediates the Effect of Alexithymia on 2-Year Change in HIV Viral Load. Int.J. Behav. Med. 24: 294. PMID: 27882489

9- McIntosh, R. C., Ironson, G., Antoni, M., Fletcher, M. A., & Schneiderman, N. (2015). Alexithymia, Assertiveness and Psychosocial Functioning in HIV: Implications for Medication Adherence and Disease Severity. AIDS and Behavior, 1-14. PMID: 26143246

Contribution #3 Behavioral, immune, and autonomic risk factors for cardiovascular disease (CVD) in HIV

Persons living with HIV are at an increased risk for CVD comorbidity. My work to this point has focused on behavioral, immune and autonomic phenotypes in HIV that may pose an increased risk for CVD. Anger and hostility are associated with an increased risk for CVD. I have shown that these traits are multidimensional in HIV+ individuals and may negatively impact health through altered psychosocial functioning (9). HIV is also known as an inflammatory disease and many have looked at inflammation as a risk factor for atherosclerosis. We have reviewed literature showing an inverse relationship between markers of chronic inflammation and cardioautonomic functioning in persons living with HIV/AIDS (10). I have also shown that despite advancements in the medication HIV patients show a deficit in heart rate variability (HRV) in the era of anti-retroviral therapy and that this reduction in HRV is skewed towards greater vagal withdrawal, compared to healthy controls, resulting in elevated sympathetic arousal (11). We showed how poor self-regulation relates to greater increase in blood pressure over time (12). Most recently, we captured neural correlates of the symptom burden of inflammation and depression (13) in addition to cardio-autonomic dysfunction in persons living with HIV (14, 15).

9-McIntosh, R. C., Hurwitz, B. E., Antoni, M., Gonzalez, A., Seay, J., & Schneiderman, N. (2014). The ABCs of Trait Anger, Psychological Distress, and Disease Severity in HIV. Annals of Behavioral Medicine, 49(3), 420-433. PMID: 25385204

10- McIntosh, R. C., Lobo, J. D., & Hurwitz, B. E. (2017). Current assessment of heart rate variability and QTc interval length in HIV/AIDS. Current Opinion in HIV and AIDS, 12(6), 528-533.
11-McIntosh, R.C. (2016). A meta-analysis of HIV and heart rate variability in the era of antiretroviral therapy. Clin Auton Res, 26: 287. PMID: 27395409

12- McIntosh, R. C., Antoni, M., Carrico, A., Duran, R., Hurwitz, B. E., Ironson, G., ... & Schneiderman, N. (2017). Change in urinary cortisol excretion mediates the effect of angry/hostile mood on 9 month diastolic blood pressure in HIV+ adults. Journal of Behavioral Medicine, 40(4), 1-11.

13- McIntosh, R. C., Paul, R., Ndhlovu, L. C., Hidalgo, M., Lobo, J. D., Walker, M., Shikuma, C.M., & Kallianpur, K.J. (2018). Resting-state connectivity and spontaneous activity of ventromedial prefrontal cortex predict depressive symptomology and peripheral inflammation in HIV. Journal of Neurovirology. DOI: https://doi.org/10.1007/s13365-018-0658-9

14- McIntosh, R. C., Lobo, J. D., Fajolu, O., Reyes E., Pattany, P.M., & Kolber, M.A. (2018). Greater N-Acetylaspartate to creatine ratio within left anterior insula predicts sympathetic imbalance in postmenopausal women living with hypertension and/or HIV. Heart Mind Journal. DOI: 10.4103/hm.hm_18_17

15- McIntosh, R. C., Chow, D. C., Lum, C. J., Hidalgo, M., Shikuma, C. M., & Kallianpur, K. J. (2017). Reduced functional connectivity between ventromedial prefrontal cortex and insula relates to longer corrected QT interval in HIV+ and HIV− individuals. Clinical Neurophysiology, 128(10), 1839-1850. DOI:10.1016/j.clinph.2017.07.398

D. Research Support

Ongoing Research Support

K01 HL139722-01 McIntosh (PI) 2/6/2018 - 2/5/2023
HIV-Related Changes to the Central-Autonomic Network and Associated Risk for Hypertension
This study proposes the use of functional neuroimaging to determine whether HIV and/or pre- hypertension (pre-HTN) has an additive or interactive effect on cardiovascular (CV) reactivity via an altered brain activity and connectivity within structures that control heart rate and blood pressure. The study aims to examine these mechanisms at rest, during mental stress, and following anger rumination.

Completed Research Support

1 NIMH T32 MH018917 Schneiderman (PI) 8/1/2012 - 7/31/2014
Biopsychosocial Research Training in Immunology and AIDS
Postdoctoral research training into the biological, behavioral psychosocial and sociocultural factors involved in the prevention, pathogenesis and management of HIV/AIDS.