SPRING 2022

Biochemistry and Molecular Biology
Brown Bag Series

John Karanja Kamau

Ph.D. Student

"Cardiomyopathy characterization of the *mdx:* lipin1 transgenic mice model"

Tuesday, April 12, 2022

11:00 AM

Location: 135 Oelman Hall

Lab:
Hongmei Ren, Ph.D.

Boonshoft School of Medicine
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https://science-math.wright.edu/biochemistry-and-molecular-biology

Abstract

Duchenne muscular dystrophy (DMD) is a X-linked disease of muscle degeneration that affects approximately 1:3500 male births worldwide. Most DMD patients develop cardiomyopathic features between ages 10 and 15 years. DMD results from mutations in the gene for the cytoskeletal protein dystrophin. Dystrophin mutation triggers instability of the plasma membrane and myofiber death. Myocardial changes from progressive non-symptomatic preclinical stage to sporadic cellular hypertrophy and eventual cardiomyopathy with widespread necrosis. Patients die in their early thirties and the main cause of death is heart failure. Currently, there is no cure for the disease.

Lipin1 is a phosphatidic acid (PA) phosphatase (PAP) that catalyzes the conversion of PA to diacylglycerol (DAG). Lipin1 is important for membrane fiber stability. Our data show that lipin1 protein and mRNA expression levels are significantly reduced in the cardiac muscle of the mdx mouse model of DMD. We generated a novel mouse model, mdx:lipin transgenic (mdx:lipin^{Tg}) mice, in which lipin1 is overexpression in cardiac muscle of mdx mice. We found out that overexpression of lipin1 in dystrophic heart improved cardiac muscle morphology by reducing; M2 murine macrophages deposition, inflammation, necroptosis and fibrosis in the myocardium. Our future study will evaluate whether overexpression of lipin1 could improve the function of dystrophic heart.