Weill Cornell Medicine-Qatar

WCM-Q research into obesity reveals new process for how fat cells increase in number

Doha – January 13, 2015: Researchers at Weill Cornell Medicine – Qatar (WCM-Q) have made important new discoveries about how fat mass expands, which could help scientists develop new medications to combat obesity.

The research, led by WCM-Q's Dr. Nayef Mazloum, focused on a protein known as 'SIRT1' that plays a key role in regulating metabolism and counteracting the complications of obesity.

Dr. Mazloum, Assistant Professor of Research in Microbiology and Immunology, explained: "Clearly, if the body's ability to properly store or burn fat is compromised, it will have a negative impact on health, leading to increased risk of diabetes, heart disease and other serious problems. For this reason we wanted to understand more about the precise mechanisms by which SIRT1 affects metabolism."

The body accumulates fat in two different ways: by hypertrophy, whereby fat cells increase in size, and hyperplasia, in which fat cells increase in number. The role of SIRT1 is well understood in hypertrophy but not in hyperplasia, which is where Dr. Mazloum's research was focused.

Using mice precursor fat cells with artificially lowered levels of SIRT1, the WCM-Q researchers were able to confirm that the protein does indeed play a key role in limiting accumulation of metabolically dysfunctional hyperplastic adipose (fat) cells.

Dr. Houari Abdesselem; the first author of the study and a Postdoctoral Associate in Dr. Mazloum's lab said: "We observed that with lower levels of SIRT1 there was increased accumulation of metabolically dysfunctional hyperplastic adipose (fat) cells. We also analyzed the altered cellular pathways driving this process. This research gave us a great insight into the mechanisms by which SIRT1 functions to maintain normal, healthy metabolism of fat.

"With this knowledge, future research can look into developing drug therapies that mimic the function of SIRT1 to help improve metabolic function of people with obesity."

The study has now been published in the renowned medical journal *The Journal of Biological Chemistry.*

Dr. Khaled Machaca, Associate Dean for Research at WCMC-Q, said: "This research contributes valuable new knowledge about the metabolic mechanisms underlying obesity. This study will be of great use to the wider biomedical research community as scientists attempt to develop new therapies to tackle the global obesity epidemic, which is one of the most pressing challenges facing medicine today in Qatar and globally."

The study, entitled 'SIRT1 Limits Adipocyte Hyperplasia Through c-Myc Inhibition' was aided by funding from the Biomedical Research Program (BMRP) program of Qatar Foundation, which supports the research effort at WCM-Q.

Other researchers who contributed to the project are Aisha Madani, Ahmad Hani, Muna Al-Noubi, Neha Goswami, Hisham Ben Hamidane, Anja M. Billing, Jennifer Pasquier, Najeeb Halabi, Rajaa Dalloul, Mohamed Z. Sheriff, Johannes Graumann and Nasrin Mesaeli, all of WCM-Q; Michael S. Bonkowski and David A. Sinclair of the Department of Genetics at Harvard Medical School, and Mohamed ElRayess of the Life Sciences Division of the Anti-Doping Lab Qatar.

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Photo Caption:
From left to right: Aisha Madani, Dr. Nayef Mazloum, Dr. Houari Abdesselem and the volunteer in Dr. Mazloum's lab Muneera Vakayil

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Weill Cornell Medicine - Qatar is a partnership between Cornell University and Qatar Foundation. It offers a comprehensive six-year medical program leading to the Cornell University M.D. degree with teaching by Cornell and Weill Cornell faculty and by physicians at Hamad Medical Corporation (HMC) and Aspetar Orthopedic and Sports Medicine Hospital who hold Weill Cornell appointments. Through its biomedical research program, WCM-Q is building a sustainable research community in Qatar while advancing basic science and clinical research. Through its medical college, WCM-Q seeks to provide the finest education possible for medical students, to improve health care both now and for future generations, and to provide high quality health care to the Qatari population.

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