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Advances in nanotechnology towards targeted treatment of obesity

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The global epidemic of obesity poses a serious health concern due to its association with chronic diseases, such as type 2 diabetes, cancer and cardiovascular diseases. These diseases are further associated with reduced quality of life and life expectancy, and contribute to high mortality rates. Obesity management primarily relies on pharmacotherapy to maintain a healthy body weight and prevent its progression to chronic diseases. However, the usefulness of anti-obesity drugs is limited due to poor efficacy, non-specificity and bystander effects. Therefore, novel approaches that could provide insights on obesity and obesity-associated diseases, as well as development of novel anti-obesity treatment modalities or improvement on the existing drugs are required. Targeted

nanotherapy potentially provides a fresh perspective that might be able to overcome drawbacks associated with conventional therapies. Independent studies have shown improved drug efficacy by using vascular-targeted therapy in diet-induced obesity models. These nanotherapeutics increased the efficacy and half-life of the therapy, and reduced the biodegradation and early drug clearance. Various nanocarriers (liposomes and gold nanoparticles) demonstrated enhanced treatment effects at lower dosage, reduced side effects, restoration of metabolic activity, and tolerability. These effects were reproducible in rodent and non-human primate obesity models, thus providing a proof of concept that targeted nanotherapy can be a feasible treatment for human obesity.

Biography

Nicole Remaliah Samantha Sibuyi is a Postdoctoral researcher at the University of Western Cape, South Africa. Her research interests are on development of targeted nanotherapy for cancer and obesity.

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