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## High fat feeding decreases global DNA methylation in the white blood cells of vervet monkeys (*Chlorocebus aethiops*)

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Aberrant DNA methylation has been implicated in the pathophysiology of many chronic diseases. Recently DNA methylation has attracted considerable interest as a biomarker to identify individuals with a high risk of developing disease. This study investigated the association between global DNA methylation and high fat feeding in vervet monkeys (*Chlorocebus aethiops*). Global DNA methylation was 2-fold lower in monkeys that were fed a high fat diet (n=10) compared to monkeys that were fed a standard diet (n=15). An inverse correlation was observed between DNA methylation, blood glucose concentrations, bodyweight and age, although the association was not statistically significant. Gender-specific differences in DNA methylation were noted. Male monkeys fed the high fat diet or those that had dysglycemia had 1.7-fold ( $p<0.05$ ) and 1.9-fold ( $p<0.05$ ) higher levels of global DNA methylation compared to female monkeys fed the high fat diet or those that had dysglycemia, respectively. Consumption of a high fat diet is associated with the development of obesity and metabolic disease, thus these results suggest the potential of global DNA methylation as a biomarker to assess the risk for these diseases. Identification of altered DNA methylation patterns could facilitate risk stratification, thus enabling intervention strategies such as the increased consumption of functional foods that have the capacity to modulate DNA methylation, thus preventing or delaying disease progression. Moreover, this study provides further support for the use of the vervet monkey as a model to apply a systems biology approach to investigate the various aspects of metabolic disease in blood and different disease associated tissues that are not possible in humans.

### Biography

Carmen Pheiffer has received her PhD in Medical Biochemistry from Stellenbosch University, South Africa. She is currently a specialist scientist at the South African Medical Research Council. She has been involved in medical research for the past twenty years working at several local and international laboratories. Over the past seven years, her research has focused on obesity and type 2 diabetes, specializing in the pathophysiology of these disorders, the development of new therapeutics from plants and the identification of epigenetic biomarkers for disease risk.

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