# Evaluation of certain physicochemical and thin film parameters including bioelectronics properties of human fat containing adipose tissues for early detection obesity in children

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Abstract: Obesity due to deposition of acyltriglycerol leads/adds directly or indirectly to various medical complications including; diabetes, hypertension, arthritis, cardio-vascular and neurological disorders. The immediate solution is surgery 'liposuction' or laser/ultrasonic/thermal radiations/surfactants assisted liposuction or surgical lipectomy without tackling the root cause of obesity. The understanding of biochemical pathways and altering the signals in the neural network may be an alternative to the cumbersome surgical procedures. In this direction, we propose to develop a bio-sensor which in turn communicates between various organs and related glands involving esterification and de-esterification of acyltrilglycerols. We propose to develop biochip to interlink the selected organs and to regulate the process to counter the biochemical blockage and to reinstall the pathways to facilitate the utilization of the fats. In this paper, the modified liposuction procedure adopted in the clinical trial for twelve patients is discussed. The fat and adipose tissues separated is subjected to biochemical, physical, chemical and thermal analysis. The result indicated that the acyltriglycerol content differ in patients. Various electrical, optical and bioelectronics properties are evaluated. The study indicated the potential use of human adipose tissue as a good candidate like cholesterol/almbumin/fatty acids as thin film material for biological studies. The thermal properties studied indicated that the fat do not only contains the triglycerides but also many constituents and the water content inside and the outside the tissues can be evaporated below 80°C. The presence of water is also a factor for the inflammation of the adipose tissue leading to obesity as evidenced by the earlier workers. The biochemical evaluation lead to the conclusion that higher amount of fat deposition containing large amount of fatty acids which contain large amount of unsaturated fatty acids, but having large chain incorporated in it. The conductivity measurement revealed the potential use of fat with tissues as an electronic measuring device. The I-V curve of the thin film is linear over a range for few patients and the impedance is very large. Even the fat collected from different parts of a single patient which again is found different from one part to the other. The pilot study indicated that these properties differ from patients to patients and also within a patient and needs large number of subjects for optimization of the parameters. The optimum use of fat and adipose tissues as biosensor for certain selected properties and to predict and control obesity in early stage is proposed. The IR, magnetic and pressure sensitivity of the film is in progress. 

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