

# Can a Multisensor Platform improve Non Invasive Glucose Monitoring

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Glucose oxidase based needle sensors for continuous in vivo glucose monitoring (CGM) are becoming more widely available. At the same time numerous other techniques including non invasive approaches are under development. In particular the needle sensors have been used in conjunction with insulin pumps to investigate their application in semi-closed or even closed loop settings. Still, a bottleneck seems to be reliability and precision of these measurement systems to really close the loop in a way so a faultless operation could be achieved in every day life.

It was recently suggested that several CGM sensors operated simultaneously could represent a possible step towards addressing the various issues identified by numerous groups over the last few years. This would represent one possible approach to improve e.g. reliability, creating a kind of network of the same sensors that represent a multisensor or rather multi signal infrastructure.

One non invasive approach to glucose monitoring (NIGM) is impedance spectroscopy (IS). However, as it was reported before a number of external and physiological factors can affect the measurement, and some of these factors may even be considered as generic perturbations to NIGM in general. In order to be able to compensate for such factors again several sensors are suggested to be operated together but in this case the multisensor platform includes different sensors like e.g. broad band IS, optical, moisture, conductance, acceleration and temperature sensors to improve glucose tracking reliability. It could even be envisioned to apply several multisensor units that are operated in a kind of sensor network on the human body.

Details are presented towards such a non invasive multisensor concept including the respective challenges together with experimental and clinical data as well as considerations towards a potential network of such sensors applied to the human body.