

# Digital Diagnostics

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## Members of the research group

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## Description of the scientific aims

The long-term goal is to develop low-cost electrochemical tools for diagnostics at point-of-care and in low resource settings. The interdisciplinary research aims to combine modern integrated circuits and related electrical components with novel chemical and biological sensing mechanisms. This is achieved using charge based sensing, namely field-effect-transistors as the electrical transducer and activating the gate of the transistor with a target specific material. The technology is universally applicable to all charge based sensing including both label free and label enhanced methods and allows seamless connection to the “cloud” using mobile phones and other wireless techniques.

## Selected publications 2010-

1. Kaisti, M., Knuutila, A., Boeva, Z., Kvarnström, C. & Levon, K. Low-cost chemical sensing platform, *IEEE Electron Device Letters*, vol. 62:8.
2. Kaisti, M., Zhang, Q., Prabhu, A., Lehmusvuori, A., Rahman, A. & Levon, K. An Ion- Sensitive Floating Gate Field-Effect Transistor Model: Operating Principles and Electrofluidic Gating, *IEEE Transact Electron Devices*, vol. 36:8, 2015.
3. Zhang Q., Majumdar H., Kaisti M., Prabhu A., Ivaska A., Österbacka A., Rahman A. and Levon K., Surface Functionalization of Ion Sensitive Floating Gate Field Effect Transistor with Organic Electronics, *IEEE Transaction on Electron Devices*, vol. 62, no 4, 2015.