

A multiplexed quantum-dot biomarker panel for point-of-care use

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Background

Point-of-care tests often measure one biomarker at a time. Quantum dots have narrow emission peaks, so several can be read in one well with little spectral overlap.

Aim

To build a twelve-channel quantum-dot immunoassay readable on a compact field instrument.

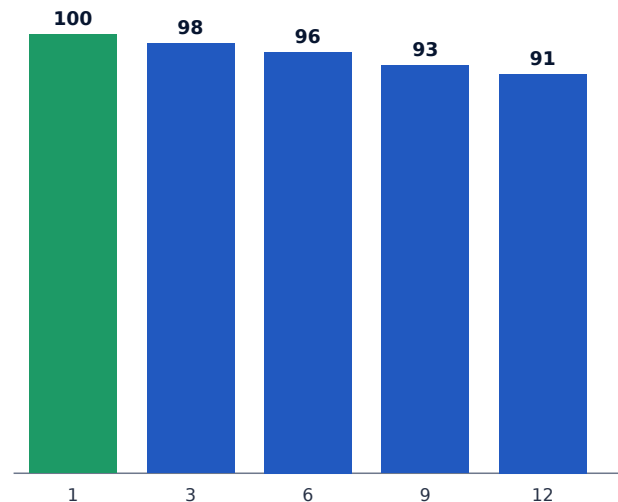
Design

- Cadmium-free quantum dots with twelve emission peaks.
- Affibody capture layers on a single chip.
- 12 V reader tolerant of 15 to 40 °C ambient; 9-minute run.

Performance

- Detection in the femtomolar range for model protein biomarkers in buffer.
- Channel cross-talk corrected without manual compensation.
- Signal stable across panel sizes from 1 to 12 channels.

Signal by panel size



Relative signal retained versus single-plex (%) as channels are added. Representative data.

Next steps

- Validation in patient-derived serum samples.
- Clinical performance study with a diagnostics partner.