

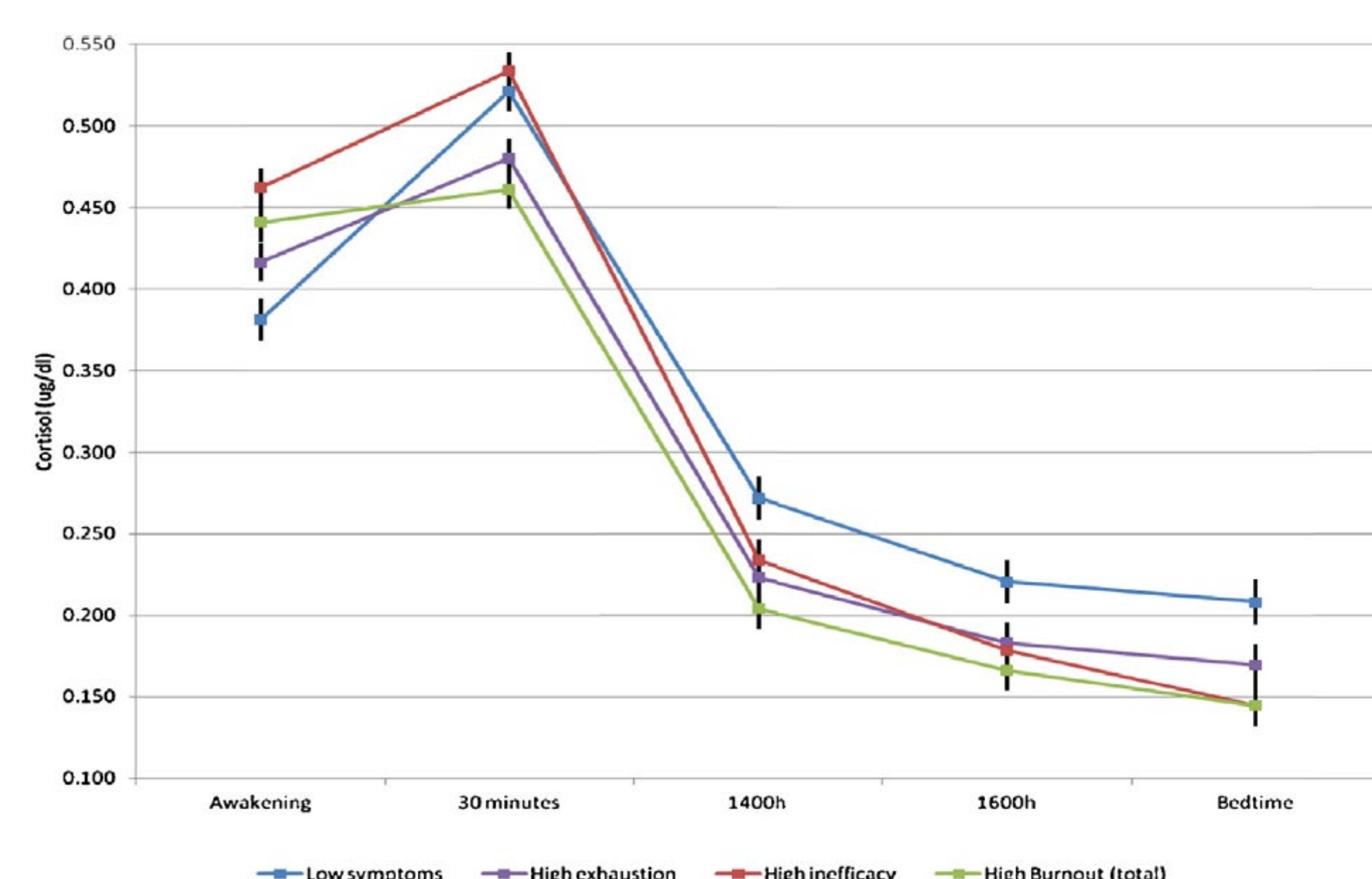
Quantitative lateral flow immunoassay for salivary cortisol

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Introduction

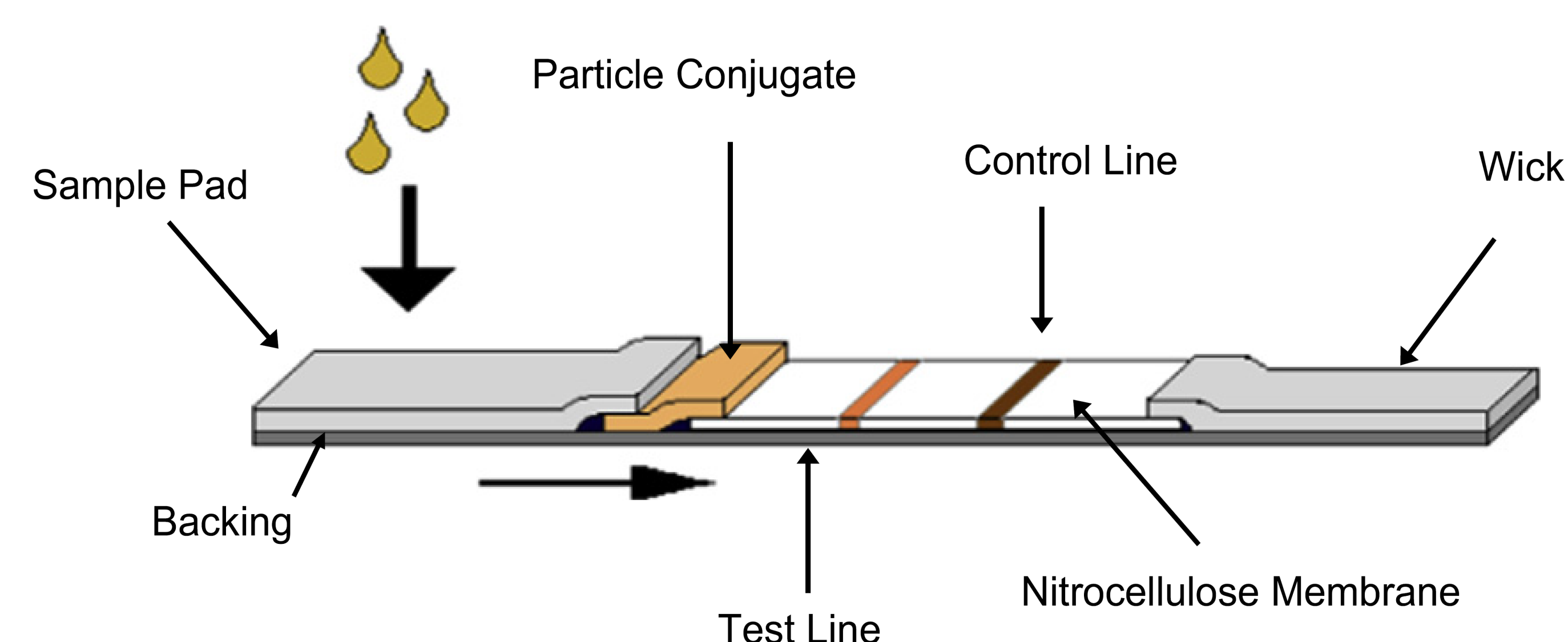
The concentration levels of salivary cortisol during the morning are indicative of the state of chronic stress of an individual. Rapid tests would be very useful for stress management by providing an objective measure of the stress level.



Marchand et al., Psychoneuroendocrinology 40 (2014)

Lateral flow immunoassay

A lateral-flow immunoassay (LFA) format was selected due to the ease of use and fast time-to-result. Fluorescence was chosen as a read-out for sensitivity. As the biomarker is a small molecule, the test is competitive.

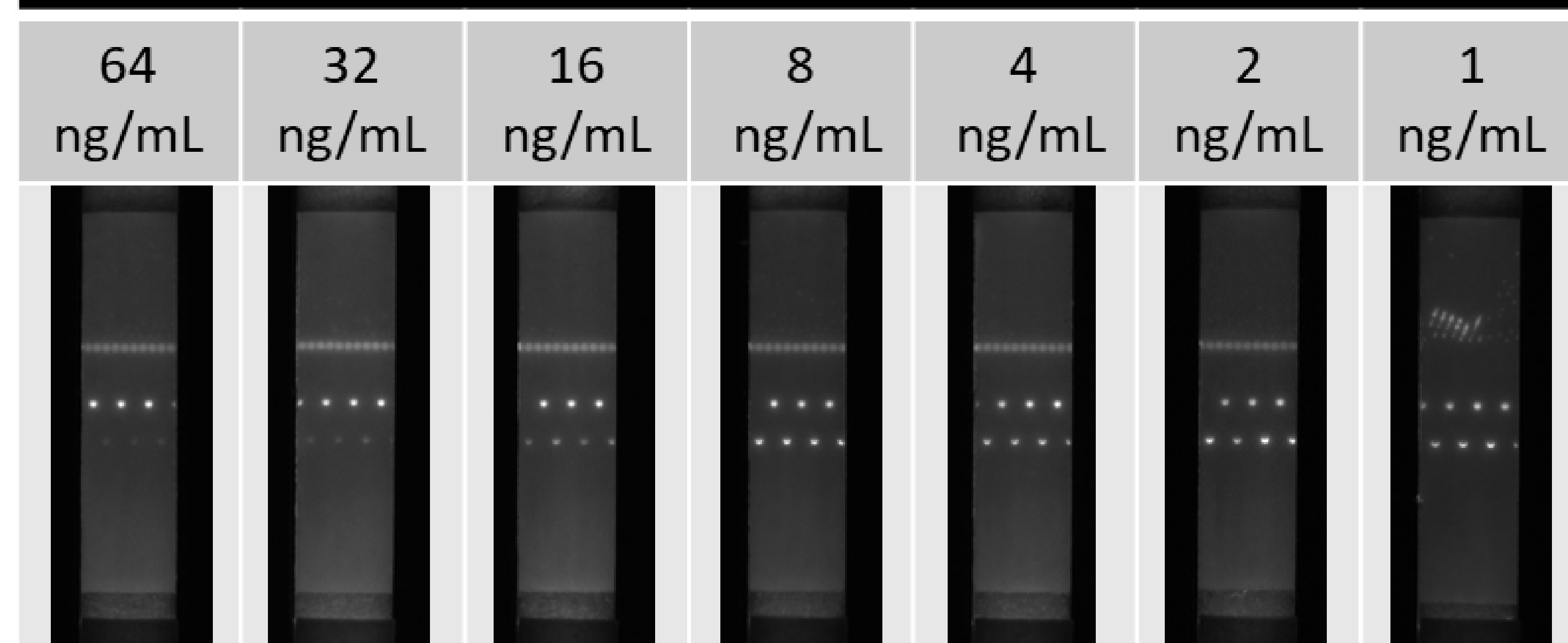


LFA using spots for detection

- We have just started to explore a new approach using spots in order
- 1) To increase the number of data points and improve the analytical performance.
 - 2) To improve normalization.
 - 3) Spots from top to bottom are R line, C line and T line.

After some trouble with the device used to spot (like it could be seen on line R of the 1 ng/mL picture), the conventional line method was used to continue the assays.

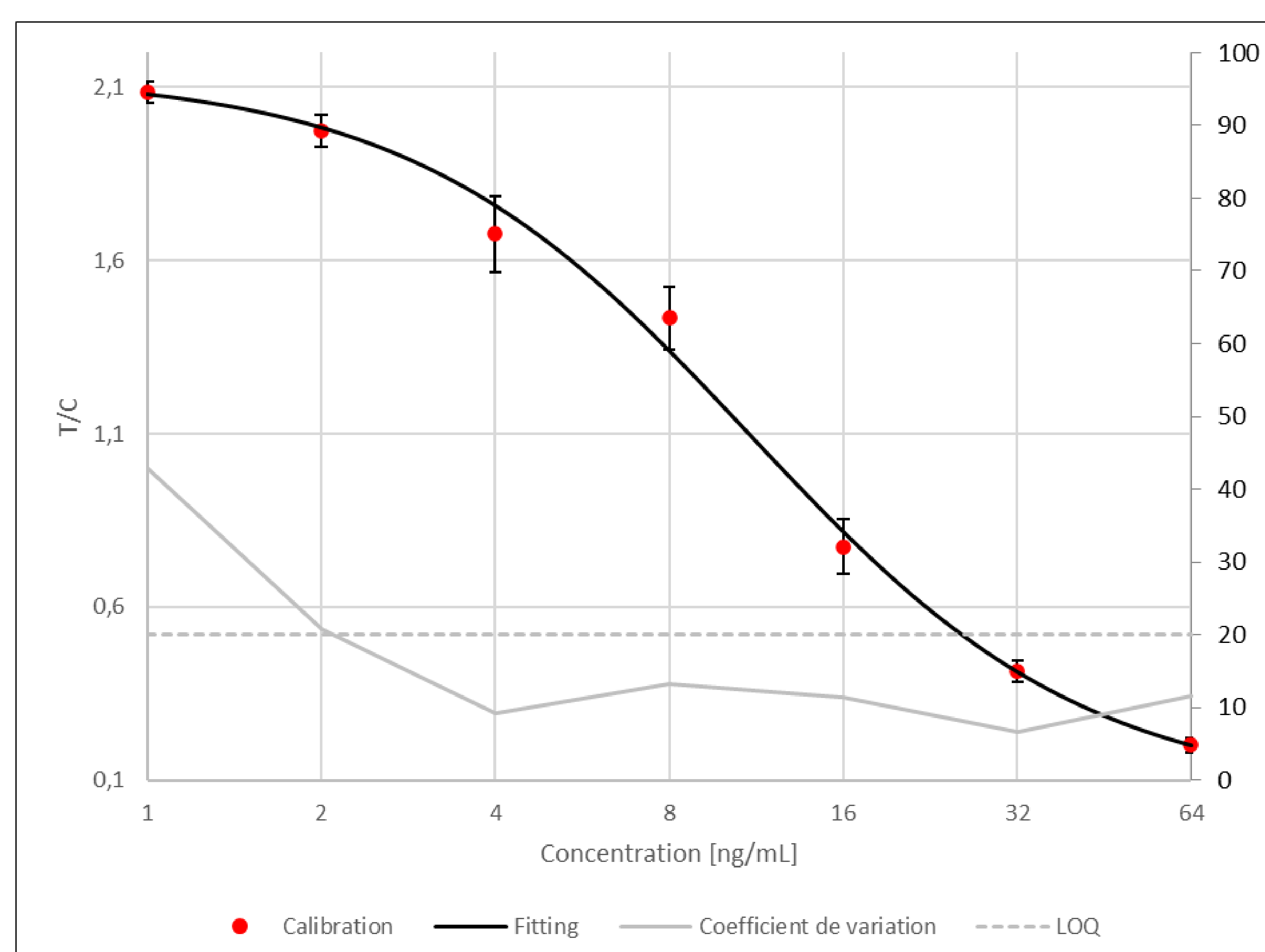
Calibration



Conventional LFA

[ng/mL]	64	32	16	8	4	2	1	0
C								
T								
T/C	0.20	0.41	0.77	1.43	1.68	1.97	2.08	2.07

Conventional LFAs (operated as a dipstick test) enabled quantification in the physiological range. The sample have been 100 μ L of saliva with very low amounts of cortisol (collected at the end of the day). It has been spiked with known amount of cortisol. No major matrix effect was observed and a calibration curve could be obtained.



Conclusions

Current achievements

- A quantitative lateral-flow immunoassay for cortisol
- A new method using spots instead of conventional line
- Use of saliva for sample instead of PBS 1x

Next steps

- Improvement of the performance of quantification by normalization
- Optimisation of the approach using test spots
- Development of a fluorescence small reader

The coefficient of variation of this assay was 7%. The analyse time was 11 min. The tests were performed in cassette. The device used to take pictures was a Fusion Fx6 from Vilber.