

Urease quantification with a newly designed microfluidic device



CATOLICA
ESCOLA SUPERIOR
DE BIOTECNOLOGIA

PORTO

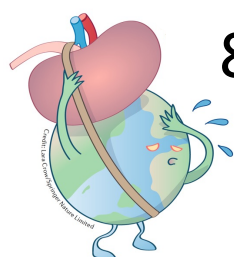
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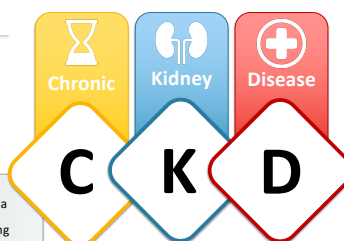


Introduction & Objective



843,6 Million people in 2017

long term condition characterized by a gradual loss of kidney function, causing the accumulation of metabolic toxins and waste, harmful for the human body.



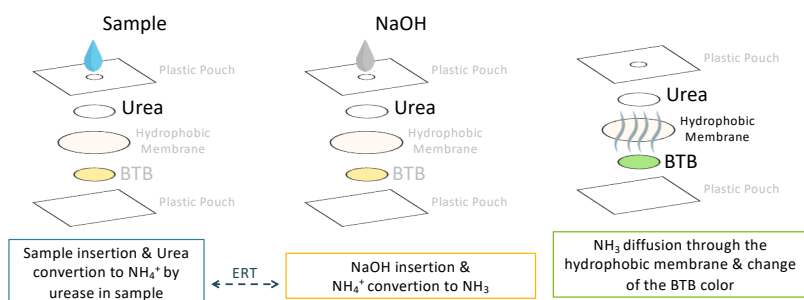
Accumulation of metabolites and toxins such as urea and NH_x in saliva

Increase of growth and proliferation of urease-producing microorganisms

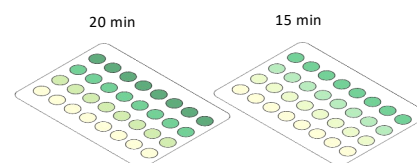
Monitoring CKD by quantification of urease in saliva

Methods & Results

μ PAD structure and determination procedure

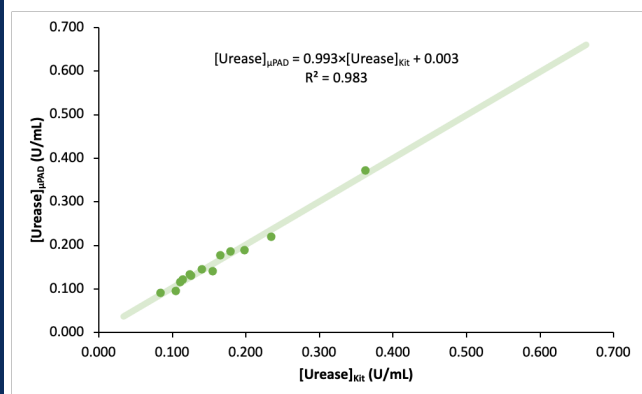
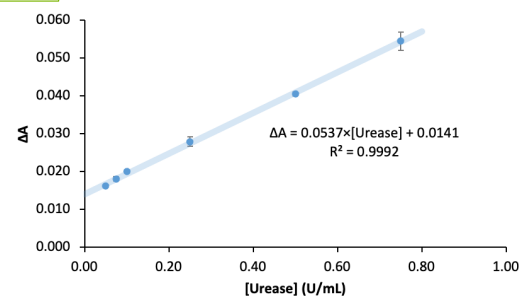


Enzymatic Reaction Time (ERT)



$$\Delta A = A_{20\text{min}} - A_{15\text{min}}$$

Dynamic Range, U/mL	Average Calibration Curve $A = S \times [\text{Urease}] + b$	LOD, U/mL	LOQ, U/mL	Repeatability, RSD	
				Intraday	Interday
0.041 – 0.75	$\Delta A = 0.0537 \times [\text{Urease}] + 0.0141$ $R^2 = 0.9992$	0.012	0.041	5%	3%



Conclusions

- ✓ Quantification of urease in saliva
- ✓ CKD monitoring
- ✓ User-friendly
- ✓ Affordable
- ✓ Portable
- ✓ Disposable



Acknowledgements

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