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Review article

Device integration of electrochemical biosensors

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Device integration of electrochemical biosensors

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Supplementary table 1 | Selected examples of commercial electrochemical biosensing devices

Product	Company	Analyte	Sensing category	Sample	Stage	Website
Cue^{TM} Reader	Cue Health	SARS-CoV-2 nucleic acids	Amperometry	nasal sample	EUA by FDA	www.cuehealth.com
ePlex System	GenMark Diagnostics	SARS-CoV-2 nucleic acids, respiratory viral and bacterial organisms	Voltammetry (DPV or SWV)	nasal sample	EUA by FDA	www.genmarkdx.com
Binx io	Binx Health	Chlamydia trachomatis and neisseria gonorrhoeae DNA	Voltammetry	female vaginal swab specimens	FDA approved	mybinxhealth.com/point-of-care
BGA-102	Wondfo Biotech	pCO_2, pO_2, pH, K^+, Na^+, Cl^-, Ca^{2+} Glucose, lactate	Potentiometry Amperometry	blood	NMPA approved	www.wondfo.org
i-STAT	Abbott	pCO_2, pO_2, pH, K^+, Na^+, Cl^-, Ca^{2+} Glucose, lactate	Potentiometry Amperometry	blood	FDA, CE, ISO approved	www.globalpointofcare.abbott/zh_cn/index.html
Plus JET	BeneCheck	Uric acid, glucose, cholesterol	Amperometry	blood	NMPA approved	www.benecheck.cn
Uric-acid meter	Sinocare	Uric acid	Amperometry	blood	CCC approved	www.sinocareintl.com
Cholesterol meter	Acon	Cholesterol	Amperometry	blood	CCC approved	www.aconlabs.com
Freestyle Libre	Abbott	Glucose	Amperometry	interstitial fluid	FDA, CE, ISO approved	www.freestylelibre.com.au
Dexcom G6 CGM	Dexcom	Glucose	Amperometry	interstitial fluid	FDA approved	www.dexcom.com
Major glucose meters in global market	Abbott Roche Life Scan Bayer	Glucose	Amperometry	blood	FDA, CE, ISO approved	www.diabetescare.abbott www.rochediabetes.com www.lifescan.com www.bayer.com/en/
Major glucose meters in Chinese market	Bionime Acon Yuwell Omron Sinocare	Glucose	Amperometry	blood	NMPA approved	www.bionime.com.cn www.aconlabs.com.cn www.yuwell.com www.omronhealthcare.com.cn www.sinocareintl.com
Tear glucose sensor	NovioSense	Glucose	Amperometry	tear	Tested in human subjects	noviosense.com

EUA, Emergency Use Authorization; FDA, U.S. Food and Drug Administration; CE, Conformite Europeenne; CCC, China Compulsory Certification; NMPA, China's National Medical Products Administration; ISO, International Standards Organization.

Supplementary table 2 | Comparison of microfluidics-assisted and one–step affinity biosensors

Sensing mode	Strategies	Target: Receptors on WE	Signal amplification	Uniqueness	Required properties	Major limitation
Multi-step sandwich affinity sensing	Pump-assisted fluidics	Proteins: antibody or antigen Nucleic acids: DNA	Enzyme- or nanomaterial labeled detection probes	Good universality, applicable to all affinity detection systems	Pumps, valve, pipes, reservoirs, special detection cell	Difficult for device integration
	PDMS-based microfluidics			Detection on a chip, easy commercialization	Microfluidic chip with biosensors, micropumps	Expensive
	Paper-based microfluidics			Self-pumping, simple, and cheap	Origami paper chip with biosensors	Easy to be interfered
One-step affinity sensing	BF sensing	Nucleic acids: DNA	---	sample-in-answer-out	---	low sensitivity
			Target-induced CRISPR/Cas12a cleaving	High sensitivity, wash-free detection	Disposable reaction tube	Unable for "sample-in-answer-out "
	PBA sensing	Proteins: DNA	DNA amplifications	DNA assisted one-step immunoassay	Disposable reaction tube	Complex solution system

WE, working electrode.