

Applications des biocapteurs : du contrôle des aliments à la recherche de vie sur Mars

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Sources bibliographiques

- [1] CLARK (L.C.) et LYONS (C.). – *Electrode systems for continuous monitoring in cardiovascular surgery*. Ann. NY Acad. Sci., 148, p. 133 à 153 (1962).
- [2] GRONOW (M.). – *Biosensors*. Trends Biochem. Sci., 9, p. 336 à 340 (1984).
- [3] LEE (M.) et WALT (D.R.). – *A fiber-optic microarray biosensor using aptamers as receptors*. Anal. Biochem., 282, p. 142 à 146 (2000).
- [4] SCHLEHUBER (S.), BESTE (G.) et SKERRA (A.). – *A novel type of receptor protein, based on the lipocalin scaffold, with specificity for digoxigenin*. J. Mol. Biol., 297, p. 1105 à 1120 (2000).
- [5] ANSELL (R.J.), RAMSTRÖM (O.) et MOSBACH (K.). – *Towards artificial antibodies prepared by molecular imprinting*. Clin. Chem., 42, p. 1506 à 1512 (1996).
- [6] PALMISANO (F.), CENTONZE (D.), QUINTO (M.) et ZAMBONIN (P.G.). – *A microdialysis fibre based sampler for flow injection analysis : determination of L-lactate in biofluids by an electrochemically synthesised bilayer membrane based biosensor*. Biosens. Bioelectron., 11, p. 419 à 425 (1996).
- [7] JENKINS (D.M.) et DELWICHE (M.J.). – *Adaptation of a manometric biosensor to measure glucose and lactose*. Biosens. Bioelectron., 18, p. 101 à 107 (2003).
- [8] GUILBAULT (G.) et LUONG (J.H.). – *In Food Biosensor Analysis*. WAGNER (G.) and GUILBAULT (G.), Eds Marcel Dekker, New-York, p. 151 à 172 (1993).
- [9] MOSBACH (K.) et DANIELSSON (B.). – *An enzyme thermistor*. Biochim. Biophys. Acta, 364, p. 140 à 145 (1974).
- [10] RAMANATHAN (K.) et DANIELSSON (B.). – *Principles and applications of thermal biosensors*. Biosens. Bioelectron., 16, p. 417 à 423 (2001).
- [11] BIRNBAUM (S.), BULOW (L.), HARDY (K.), DANIELSSON (B.) et MOSBACH (K.). – *Automated thermometric enzyme immunoassay of human proinsulin produced by Escherichia coli*. Anal. Biochem., 158, p. 12 à 19 (1986).
- [12] RAMANATHAN (K.), RANK (M.), SVITEL (J.), DZGOEV (A.) et DANIELSSON (B.). – *The developments and application of thermal biosensors for bioprocess monitoring*. Trends Biotechnol., 17, p. 499 à 505 (1999).
- [13] BOSCH (M.E.), SANCHEZ (A.J.), ROJAS (F.S.) et OJEDA (C.B.). – *Optical chemical biosensors for high-throughput screening of drugs*. Comb. Chem. High Throughput Screen., 10, p. 413 à 432 (2007).
- [14] KUANG (Y.), BIRAN (I.) et WALT (D.R.). – *Living bacterial cell array for genotoxin monitoring*. Anal. Chem., 76, p. 2902 à 2909 (2004).
- [15] GARLAND (P.B.). – *Optical evanescent wave methods for the study of biomolecular interactions*. Q. Rev. Biophys., 29, p. 91 à 117 (1996).
- [16] HUTCHINSON (A.M.). – *Evanescence wave biosensors. Real-time analysis of biomolecular interactions*. Mol. Biotechnol., 3, p. 47 à 54 (1995).
- [17] JOHNSON (B.), LOFAS (S.) et LINDQUIST (G.). – *Immobilization of proteins to a carboxymethyl-dextran-modified gold surface for biospecific interaction analysis in surface plasmon resonance sensors*. Anal. Biochem., 198, p. 268 à 277 (1991).
- [18] HOMOLA (J.), DOSTALEK (J.), CHEN (S.), RASOOLY (A.), JIANG (S.) et YEE (S.S.). – *Spectral surface plasmon resonance biosensor for detection of staphylococcal enterotoxin B in milk*. Int. Dairy J. Food Microbiol., 75, p. 61 à 69 (2002).
- [19] DUPONT (D.). – *Applications des biocapteurs dans l'industrie agro-alimentaire*. [F 4 010] Techniques de l'ingénieur, p. 1 à 15.
- [20] VERMEIR (S.), NICOLAI (B.M.), VERBOVEN (P.), VAN GERWEN (P.), BAETEN (B.), HOFACK (L.), VULSTEKE (V.) et LAMERTYN (J.). – *Microplate differential calorimetric biosensor for ascorbic acid analysis in food and pharmaceuticals*. Anal. Chem., 79, p. 6119 à 6127 (2007).
- [21] HASEGAWA (K.), MIWA (S.), TAJIMA (T.), TSUTSUMIUCHI (K.), TANIGUCHI (H.) et MIWA (J.). – *A rapid and inexpensive method to screen for common foods that reduce the action of acrylamide, a harmful substance in food*. Toxicol. Lett., 175, p. 82 à 88 (2007).
- [22] STOBIECKA (A.), RADECKA (H.) et RADECKI (J.). – *Novel voltammetric biosensor for determining acrylamide in food samples*. Biosens. Bioelectron., 22, p. 2165 à 2170 (2007).
- [23] RADKE (S.M.) et ALOCILJA (E.C.). – *A high density microelectrode array biosensor for detection of E. coli O157:H7*. Biosens. Bioelectron., 20, p. 1662 à 1667 (2005).
- [24] VARSHNEY (M.) et LI (Y.). – *Interdigitated array microelectrode based impedance biosensor coupled with magnetic nanoparticle-antibody conjugates for detection of Escherichia coli O157:H7 in food samples*. Biosens. Bioelectron., 22, p. 2408 à 2414 (2007).
- [25] SHRIVER-LAKE (L.C.), TURNER (S.) et TAITT (C.R.). – *Rapid detection of Escherichia coli O157:H7 in spiked food matrices*. Anal. Chim. Acta, 584, p. 66 à 71 (2007).
- [26] HEARTY (S.), LEONARD (P.), QUINN (J.) et O'KENNEDY (R.O.). – *Production, characterization and potential application of a novel monoclonal antibody for rapid identification of virulent Listeria monocytogenes*. J. Microbiol. Methods, 66, p. 294 à 312 (2007).
- [27] NANDURI (V.), BHUNIA (A.K.), TU (S.-I.), PAOLI (G.C.) et BREWSTER (J.D.). – *SPR biosensor for the detection of L. monocytogenes using phage-display antibody*. Biosens. Bioelectron., 23, p. 248 à 252 (2007).
- [28] SAPSFORD (K.E.), TAITT (C.R.), LOO (N.) et LIGLER (F.). – *Biosensor detection of Botulinum toxin A and Staphylococcal enterotoxin B in food*. Appl. Environ. Microbiol., 71, p. 5590 à 5592 (2005).
- [29] ZHAO (J.), JEDLICKA (S.S.), LANNU (J.D.), BHUNIA (A.K.) et RICKUS (J.L.). – *Liposome-doped nanocomposites as artificial-cell-based biosensors : detection of listeriolysin O*. Biotechnol. Prog., 22, p. 32 à 37 (2006).
- [30] KALOGIANNI (D.P.), KORAKI (T.), CHRISTOPOULOS (T.K.) et IOANNOU (P.C.). – *Nanoparticle-based DNA biosensor for visual detection of genetically modified organisms*. Biosens. Bioelectron., 21, p. 1069 à 1076 (2006).
- [31] MALMHEDEN YMAN (I.), ERIKSSON (A.), JOHANSSON (M.A.) et HELLENAS (K.E.). – *Food allergen detection with biosensor immunoassays*. J. AOAC Int., 89, p. 856 à 861 (2006).

- [32] LARSEN (L.H.), KJAER (T.) et REVSBECH (N.P.). – *A microscale n° 3-biosensor for environmental applications*. Anal. Chem., 69, p. 3527 à 3531 (1997).
- [33] LORENZEN (J.), LARSEN (L.H.), KJAER (T.) et REVSBECH (N.P.). – *Biosensor determination of the microscale distribution of nitrate, nitrate assimilation, nitrification, and denitrification in a diatom-inhabited freshwater sediment*. Appl. Environ. Microbiol., 64, p. 3264 à 3269 (1998).
- [34] KRÖGER (S.) et LAW (R.J.). – *Sensing the sea*. Trends Biotechnol., 23, p. 250-256 (2005).
- [35] DIERKS (S.), METFIES (K.) et MEDLIN (L.K.). – *Development and adaptation of a multi-probe biosensor for the use in a semi-automated device for the detection of toxic algae*. Biosens. Bioelectron., 23, p. 1527 à 1533 (2008).
- [36] PENALVA (J.), GONZALEZ-MARTINEZ (M.A.), PUCHADES (R.), MAQUIEIRA (A.), MARCO (M.-P.) et BARCELO (D.). – *Immuno-sensor for trace determination of Irgarol 1051 in seawater using organic media*. Anal. Chim. Acta, 387, p. 227 à 233 (1999).
- [37] MALLAT (E.), BARZEN (C.), ABUKNESHA (R.), GAUGLITZ (G.) et BARCELO (D.). – *Fast determination of paraquat residues in water by an optical immunosensor and validation using capillary electrophoresis-ultraviolet detection*. Anal. Chim. Acta, 427, p. 165 à 171 (2001a).
- [38] MALLAT (E.), BARZEN (C.), ABUKNESHA (R.), GAUGLITZ (G.) et BARCELO (D.). – *Part per trillion level determination of isotoproturon in certified and estuarine water samples with a direct optical immunosensor*. Anal. Chim. Acta, 426, p. 209 à 216 (2001b).
- [39] TSCHMELAK (J.) et al. – *Automated Water Analyser Computer Supported System (AWACSS). Part II: intelligent, remote-controlled, cost-effective, on-line, water-monitoring measurement system*. Biosens. Bioelectron., 20, p. 1509 à 1519 (2005).
- [40] RODRIGUEZ-MOZAZ (S.), MARCO (M.-P.), LOPEZ DE ALDA (M.J.) et BARCELO (D.). – *Biosensors for environmental monitoring of endocrine disruptors: a review article*. Anal. Bioanal. Chem., 378, p. 588 à 598 (2004).
- [41] TIMS (T.B.) et LIM (D.V.). – *Rapid detection of Bacillus anthracis spores directly from powders with an evanescent wave fiber-optic biosensor*. J. Microbiol. Methods, 59, p. 127 à 130 (2004).
- [42] ARDUINI (F.), AMINE (A.), MOSCONE (D.), RICCI (F.) et PALLESCHI (G.). – *Fast, sensitive and cost-effective detection of nerve agents in the gas phase using a portable instrument and an electrochemical biosensor*. Anal. Bioanal. Chem., 388, p. 1049 à 1057 (2007).
- [43] SINGH (S.). – *Sensors – An effective approach for the detection of explosives*. J. Hazard Mater., 144, p. 15 à 28 (2007).
- [44] ZHANG (B.), ZHANG (X.), YAN (H.-H.), XU (S.-J.), TANG (D.-H.) et FU (W.-L.). – *A novel multi-array immunoassay device for tumor markers based on insert-plug model of piezoelectric immunosensor*. Biosens. Bioelectron., 23, p. 19 à 25 (2007).
- [45] KOPF (E.) et ZHARHARY (D.). – *Antibody arrays – An emerging tool in cancer proteomics*. Int. J. Biochem. Cell Biol., 39, p. 1305 à 1317 (2007).
- [46] ARYA (S.K.), DATTA (M.) et MALHOTRA (B.D.). – *Recent advances in cholesterol biosensor*. Biosens. Bioelectron., in Press (2007).
- [47] HAES (A.J.), CHANG (L.), KLEIN (W.L.) et VAN DUYN (R.P.). – *Detection of a biomarker for Alzheimer's disease from synthetic and clinical samples using a nanoscale optical biosensor*. J. Am. Chem. Soc., 127, p. 2264-2271 (2005).
- [48] MASTROTOTARO (J.). – *The MiniMed Continuous Glucose Monitoring System (CGMS)*. J. Pediatr. Endocrinol. Metab., 12, p. 751 à 758 (1999).
- [49] KEUSGEN (M.). – *Biosensors: new approaches in drug discovery*. Naturwissenschaft, 89, p. 433 à 444 (2002).
- [50] SKELLEY (A.M.), SCHERER (J.R.), AUBREY (A.D.), GROVER (W.H.), IVESTER (R.H.C.), EHRENFREUND (P.), GRUNTHANER (F.J.), BADA (J.L.) et MATHIES (A.). – *Development and evaluation of a microdevice for amino acid biomarker detection and analysis on Mars*. Proc. Natl. Acad. Sci. USA, 102, p. 1041 à 1046 (2005).
- [51] ALOCILJA (E.C.) et RADKE (S.M.). – *Market analysis of biosensors for food safety*. Biosens. Bioelectron., 18, p. 841 à 846 (2003).
- [52] FITZPATRICK (J.), FANNING (L.), HEARTY (S.), LEONARD (P.), MANNING (B.M.), QUINN (J.Q.) et O'KENNEDY (R.). – *Applications and recent developments in the use of antibodies for analysis*. Anal. Lett., 33, p. 2563 à 2609 (2000).
- [53] IVNITSKI (D.), HAMID (I.A.), ATANASOV (P.) et WILKINS (E.). – *Biosensors for detection of pathogenic bacteria*. Biosens. Bioelectron., 14, p. 599 à 624 (1999).

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