

Feature Extraction from Sensor Data for Detection of Wound Pathogen Based on Electronic Nose

Jia Yan*, Fengchun Tian, Qinghua He¹, Yue Shen¹,
Shan Xu, Jingwei Feng and Kadri Chaibou

College of Communication Engineering, Chongqing University, Chongqing, 400030, China
¹State Key Laboratory of Trauma, Burns and Combined Injury, Institute of Surgery Research,
Daping Hospital, Third Military Medical University, Chongqing, 400042, China

(Received November 2, 2010; accepted March 23, 2011)

Key words: electronic nose, wound infection, feature extraction, curve fitting

Three feature extraction methods, extraction from original response curves of sensors, curve fitting parameters and transform domains, for pathogen detection based on an electronic nose have been discussed. By using the integrals, coefficients of exponential fitting with two parameters and hyperbolic tangent function fitting, Fourier coefficients, and wavelet coefficients as features, 100% identification accuracy with the radical basis function neural network (RBFNN) classifier was reached for the seven pathogens. Theoretical analysis and experimental results indicate that the methods based on dynamic response are better than those based on steady response and can provide accurate identification of common pathogens present in wound infection.

*Corresponding author: e-mail: yanjia119@163.com