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(71)Name of Applicant :

1)NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY

Address of Applicant :19, Knowledge Park-II, Institutional Area, Greater Noida – 201306, Uttar Pradesh, India. -----

Name of Applicant : NA

Address of Applicant : NA

(72)Name of Inventor :

1)NEERAJ AGARWAL

Address of Applicant :Department of Biotechnology, Noida Institute of Engineering & Technology, Greater Noida. Greater Noida -----

(57) Abstract :

The invention discloses a biodegradable microfluidic chip (100) for on-site pathogen detection in water and food samples. The chip comprises a sample inlet (101), microchannels (102), reaction chambers (103), reagent storage zones (104), a detection zone (105), microvalves (107), and a waste outlet (106). Fabricated from compostable materials like PLA and cellulose acetate, the device enables colorimetric or electrochemical detection using strips (108) or electrodes (109). The chip provides rapid, eco-friendly, and cost-effective pathogen analysis with safe post-use disposal.

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