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(54) Title of the invention : A SMART BIOREACTOR SYSTEM WITH ADAPTIVE OXYGENATION AND PH FEEDBACK LOOPS FOR OPTIMIZED PROTEIN EXPRESSION

(57) Abstract :

The present invention discloses a smart bioreactor system (100) comprising a vessel (101), dissolved oxygen sensor (102), pH probe (103), micro-injectors (104), aeration module (105), impeller (106), and central control unit (107). The system utilizes adaptive oxygenation and pH feedback loops, driven by AI-based predictive algorithms, to maintain optimal culture conditions. Real-time monitoring and adjustments ensure enhanced protein expression with consistent quality. The modular system supports scalability and remote operation through a cloud-based interface (114), reducing manual interventions and improving process efficiency.

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