P-26 Construction of Streptococcus pyogenes mutants by allele r eplacement mutagenesis

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S. pyogenes secrete a large array of molecules that might contribute to resistance against antimicrobial peptides (AMPs). Some of these are anchored in the cell-wall by enzymes called sortases and others are released from the cell after secretion. One of the released proteins that have previously been reported to inhibit bactericidal effect of the AMPs are streptococcal inhibitor of complement (SIC). SIC has been recognised as a substantial virulence factor in the M1 GAS strain AP1, because Δsic mutant failed to colonise mouse throat (Lukomski et al., 2000). In fact, the colonisation of the SIC-negative strain was significantly impaired during the first four days of post-inoculation, showing that SIC is a crucial virulence factor during the early stages of infection by this strain (Lukomski et al., 2000). Hoe and colleagues then showed that GAS Δsic mutant was easily internalised and killed more effectively by human epithelial cells than the wild-type strain (Hoe et al., 2002). Previous studies used SIC-defective mutants which were constructed by insertion of transposon. The disadvantage of such mutagenesis is that the GAS mutants may have retained an intact copy of the sic gene, which could express some SIC protein. Therefore, the specific objective of the project was to construct a sic deletion mutant of GAS strain SF370 by allele-replacement mutagenesis. The constructed mutant would have a genetically clearly-defined deletion mutant, that completely removed sic gene from the S. pyogenes strain SF370 chromosome, without leaving any foreign sequences (such as an inserted plasmid) behind.

P-31 MEMS Energy Harvester and Condition Monitoring Sensor for Power Plants

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Energy harvesting devices which convert ambient energy to electrical energy has been a very practical source for renewable energy. The design and simulation of MEMS based piezoelectric cantilever beam for energy harvesting application is presented in this paper. The piezoelectric energy harvesting devices presented is able to harvest mechanical energy (vibration) to electrical energy. The main target is to develop of a prototype of piezoelectric micro generator system for condition monitoring sensor in power plant application. The design of the cantilever beam presented consists of a cantilever beam structure with the interdigitated electrodes on the zinc oxide piezoelectric layer with nickel proof mass at the end of the beam. Due to many sources in the ambient vibration are in lower frequency, the piezoelectric energy harvesting device presented will operate between 50 to 150 Hz to optimize the power output. The aim of this paper is to obtain the resonance frequency which gives the highest displacement.

P-32 Electrical Cell-substrate Impedance Sensing (ECIS) based Biosensor for detection of DF-1 Cells

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Cell-based sensing techniques and their novel applications are actively researched as a continuous and real-time measurement for bio-sensing. Unlike conventional biosensors that use attached affinity recognition molecules (e.g. antibodies), cell-based biosensors use living cells, which have a variety of native biomolecules on their surfaces. These sensors rely mainly on fluorescence and electronic detection for sensing various cellular events, while cell-electronic sensors are often based on impedance