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Molecular diversity of *Staphylococcus aureus* from the nares of diabetes mellitus patients in Yaounde, Cameroon

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Globally, information on the genotypic diversity of *Staphylococcus aureus* is relevant for managing the epidemiological and clinical challenges resulting from the clonal nature of this bacterium. The study objective was to determine epidemiological and clonal diversity of carrier *Staphylococcus aureus* isolates from the nares of diabetes mellitus patients in Yaounde, Cameroon. We enrolled 245 diabetes mellitus patients after obtaining assent. API-Staph was used to phenotypically identify isolates. Multiplex PCR assays were used for molecular confirmation, *mecA* (methicillin resistance) and the *LukS/F-PV* operon (Panton-Valentine Leukocidin). Multiplex PCR were also used for Staphylococcal cassette chromosome typing. Clonal relatedness was by Pulsed Field Gel Electrophoresis and genotyped isolates assigned sequence types by Multilocus Sequence Typing. 96 (39%) of participants were carriers of *S. aureus*. The *mecA* and *lukS/F-PV* genes were detected in 54% (52) and 58% (56) respectively. Simultaneously, 37% (36) carried the *mecA* and the *lukS/F-PV* genes. Overall, 56% (29) of the strains harboring *mecA* typed as SCC*mec* type V followed by type IV 38% (20). PFGE results clustered isolates into 14 pulsotypes. Based on MLST types, isolates were assigned to 6 pandemic clonal complexes (CCs): CC5 CC8, CC15, CC25, CC72 and CC121 and 3 atypical sequence types (ST 508, ST 699 and ST 1289) with ST 1289 having characteristics of epidemic clones. Prevalence of methicillin resistance and *lukS/F-PV* was high. *S. aureus* clones circulating in Yaounde are genetically diverse. These strains could have far reaching effects on epidemiology surveillance and control strategies in this context where genetic markers are not routinely monitored.

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Reconstituted virus-like particles as delivery systems for self-amplifying RNA genes for cancer detection and therapy

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In this talk I describe our synthesis of perfectly mono disperse and highly robust spherical virus-like particles (VLPs) from purified RNA and protein. The protein is from the capsid of the plant virus *Cowpea chlorotic mottle virus* (CCMV) and the RNA is a genetically engineered insect virus (Nodamura) genome with genes of interest replacing its structural genes. Significantly, these non-infectious, hybrid VLPs are capable of delivering their RNA content for efficient translation in mammalian cells. Further, the first, RNA-dependent-RNA-polymerase (RdRp), gene product of their RNA gives rise to a high level of RNA replication and hence to strong expression of the genes of interest that have been inserted into the RdRp-coding portion of Nodamura. Results are presented for the *in vivo* expression of ferritin protein for enhancing MRI contrast and of cancer antigens for eliciting immune response.

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