Implen Journal Club | March Issue

Welcome to our March issue of the #Implen #JournalClub in 2021.

The foodborne bacteria Listeria monocytogenesis repeatedly linked to food recalls and outbreaks of foodborne illness. Therefore, rapid molecular methods, which specifically detect viable L. monocytogenes are needed, so the aim of Martin Laage Kragh, Mikala Thykier and Lisbeth Truelstrup Hansen from Technical University of Denmark was to develop a qPCR method for specific enumeration of viable L. monocytogenes in food processing facilities and heat treated products. In summary, this long-amplicon PMA-qPCR method can aid in the detection and enumeration of viable L. monocytogenes cells to further the understanding of its survival and persistence in food processing facilities. The developed method was demonstrated to work on both heat and desiccation

treated cells and highlights the importance of amplicon size in viability-qPCR. The NanoPhotometer® was used to measure strains after harvest which were resuspended in TSB-glu to an absorbance at 600 nm of 1.

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We would like to congratulate Sagal Mohamed, Happiness Mvungi, Margaretha Sariko, Prakruti Rao, Peter Mbelele, Erwin Jongedijk, Claudia van Winkel, Daan Touw, Suzanne Stroup, Jan-Willem Alffenaar, Stellah Mpagama and Scott Heysell on their second publication about detecting levofloxacin pharmacokinetics in saliva samples using the NanoPhotometer® as a point-of-care screen for subtarget levofloxacin exposure which was supported by the Bill & Melinda Gates Foundation. Their joint efforts resulted in a clinical pilot study among people treated for rifampicin-resistant TB in Tanzania as previously reported. It was the first time that saliva samples were measured by a spectrophotometer among people treated for MDR-TB in Tanzania. The levofloxacin concentration was quantified by using the amplitude of the second-order spectrum between 300 and 400 nm. The second-order spectrum was calculated using the Savitsky–Golay method. We look forward to further studies in this exciting field of research.

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Alzheimer's disease is a neurodegenerative condition marked by the formation and aggregation of amyloid-β (Aβ) peptides. A recent study by Isabella Gastaldo, Sebastian Himbert, Udbhav Ram and Maikel Rheinstädter from McMaster University aimed to determine if natural molecules can change the size and volume fraction of Aclusters. They studied the impact of resveratrol, found in grapes, caffeine, the main active ingredient in coffee, β-carotene, found in orange fruits and vegetables, and epigallocatechin gallate (EGCG), a component of green tea, on the size and volume fraction of Aβ aggregates. β-carotene significantly reduces plaque size and, interestingly, EGCG dissolves peptide aggregates and significantly decreases the corresponding cross-β and β-sheet signals. The NanoPhotometer® was used to measure ThT absorbance spectra for membranes containing Aβ 25–35 in the presence of a) resveratrol, b) caffeine, c)-carotene, and d) EGCG.

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Have you ever thought of running a kinetic study in just a drop? They have: Qiang Wang, Delin Zhang, Zeyuan Guan, Dongqin Li, Kai Pei, Jian Liu, Tingting Zou and Ping Yin from Huazhong Agricultural University investigated the potential of regulators involved in the RNA–pyrophosphohydrolysis process in prokaryotes as mRNA decay is an important strategy by which bacteria can rapidly adapt to their ever-changing surroundings. A diaminopimelateepimerase, DapF, can directly interact with RNA pyrophosphohydrolase and stimulate its hydrolysis activity in vivo and in vitro. The enzymatic activity of DapF was determined by using the modified DapF–DAP dehydrogenase coupled spectrophotometric assay. DapF was added into the reaction and quickly mixed to homogeneity. Two microliter of the sample was immediately loaded onto NanoPhotometer®

N60 and the absorbance at 340 nm was consecutively recorded for 2 min, with an interval of 5 s.

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