BCIL Biotech Consortium India Limited

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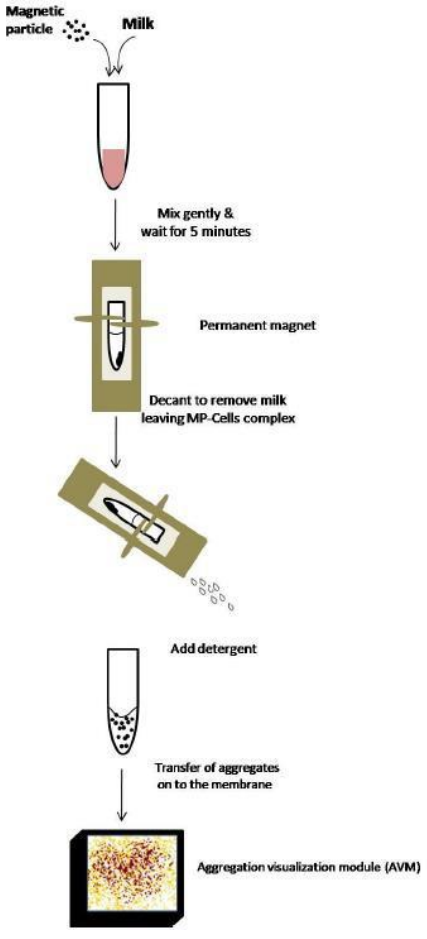
Accelerating Technology Translation

Subclinical and Clinical Mastitis Diagnosis through assessment of Milk

TECHNOLOGY AVAILABLE FOR TRANSFER

BACKGROUND

- Mastitis is an inflammation of the mammary glands characterized by pain, redness and swollen udders leading to increase in blood cells, pus cells and somatic cells leading to reduction in quantity and quality of milk. Consumption of such milk might pose a threat to public health due to presence of microbes that may be of zoonotic nature.
- The disease is classified as clinical and subclinical depending on the degree of inflammation in the mammary gland.
- California Mastitis Test (CMT) is the gold standard "cow side" test to detect clinical mastitis while it does not have sensitivity to detect the subclinical stage (Somatic cell count <200,000/mL of milk).
- The estimated annual economic loss incurred due to mastitis is estimated to be Rs. 6053.21 Crores and out of which loss of Rs. 4365.32 Crore due to sub-clinical mastitis (for which there is no diagnostic test available). The current methods of prevention and treatment have proven to be inadequate in effectively controlling this pervasive problem.
- An early detection of mastitis has been found to have high prognostic value as starting the medication at an early stage leads to rapid cure of the condition.



TECHNOLOGY

- The present invention provides a method for detection of subclinical as well as clinical mastitis and assessment of microbial quality of milk using non-functionalized iron oxide nanoparticles.
- Such aggregation of nanoparticles and somatic cells CAN be visualized on the "aggreg ation visualization module" or AVM after addition of a surfactant.
- The present invention has 200 times higher sensitivity as compared to "California Mastitis Test" with a detection sensitivity up to 25,000 cells/mL in the biological fluid. The assay has more than 91 % sensitivity, 100% specificity and reproducibility as compared to quantitative Fossometric SSC counting.
- The method is simple involving addition of iron oxide nanoparticle and surfactant solution directly into the milk obtained from suspected cattle followed by agitation, magnetic separation, aggregation, and visualization with naked eyes.

VALIDATION AND IP STATUS

In-house and third-party validation of the test using milk samples collected from dairy farm was conducted where the result correlated well with clinical condition of the animal and the somatic cell count.

Indian Patent Application pending at the Indian Patent Office

APPLICATIONS

- Detection of subclinical and clinical mastitis.
- Testing of microbial quality of milk.
- Monitoring the recovery of animals from mastitis after antibiotic treatment
- The test may also be useful for assessing somatic cell count in various human inflammatory diseases.

UNIQUE SELLING PROPOSITION

- Compatibility with the technical capabilities of farmers and other staff at veterinary center and hospitals, household, etc.
- Does not require any additional equipment, instrument and staining procedure.
- Improved sensitivity of detection vis-à-vis CMT and the gold standard of mastitis diagnosis i.e. microbiological culture analysis.
- Comparison of the data with aggregation chart help in semiquantitative assessment of the various levels of mastitis.
- The effective cost of the kit for one test will be less than INR 25.

LICENSING OPPORTUNITY

TTO@BCIL is looking for a suitable industrial partner for the development and commercialization of this mastitis diagnostic technology.

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