

Executive Summary



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1. Title of the Project: **ABDUL KALAM TECHNOLOGY INNOVATION NATIONAL FELLOWSHIP** (Development of ultrasensitive nano-biosensor platforms (Electrochemical/ Chemiresistive) for complement C3 and C3a sensing)

2. Date of Start of the Project: 1st October 2020.

3. Aims and Objectives:

- Development of ultrasensitive nano-biosensor platforms (Electrochemical/ Conductometric) for complement C3 and C3a sensing.
- Integration of sensing platform with electronics chip and calibration for quantification of analytes further integration of electronics hardware chip to smart mobile.
- Real time testing with samples (both with blind samples and samples with known analytic concentration).
- Data analytic algorithm for accurate quantification of C3 and C3a concentration.
- Start up and VC investments.

4. Significant achievements (not more than 500 words to include List of patents, publications, prototype, deployment etc)

- a) Successfully Fabricated the Indium-Doped ZnO (InZnO) Nanofibers and used them to detect the target analytes (complement C3 Protein) on electrochemical platforms.
- b) Successfully Characterized Indium-Doped ZnO (InZnO) Nanofibers using XRD, FTIR, TEM, SEM (InZnO)

- c) Development and Testing of ultrasensitive nano-biosensor (Electrochemical platforms) for complement C3 sensing.
- d) Manuscript submitted for C3 spike protein sensing work using Electrochemical Platform and one patent filed.

5. Concluding remarks: We have checked and verified the C3 spike protein on the Electrochemical Platform. The same can be checked for C3a spike protein in the future. Also, we have designed and fabricated the Interdigitated Electrodes (IDE) based 3-Sensor Chip and 4-Sensor Chip which can be used as a chemiresistive sensor with integrated smart mobile measurements. Also, use Data analytic algorithm for accurate quantification of C3 and C3a concentration for real AMD samples. We have already filed the patent for the same. Patent file number is given below.

METALLIC TRANSITION METAL DICHALCOGENIDE BASED CHEMIREISTIVE BIOSENSOR : Patent: file number.
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