

May 22, 2023

May 22, 2023

### **JMI & CSIR-IGIB research shows how obesity affects stem cell treatment**

The researchers from Multidisciplinary Centre for Advanced Research & Studies (MCARS), Jamia Millia Islamia (JMI) have developed therapeutic stem cells to treat lung diseases caused by allergic respiratory inflammation. The group, led by Dr. Tanveer Ahmad (MCARS, JMI), found that stem cells obtained from healthy individuals can be genetically modulated to treat lung diseases.

The team discovered that a decrease in cardiolipin content in the energy-generating organelle mitochondria caused the stem cells to become dysfunctional and exhibit impaired metabolic fitness. To address this issue, the team identified a small molecule called Pyrroloquinoline quinone (PQQ) that could reverse the effect and restore metabolic activity to these stem cells.

The researchers introduced these stem cells into pre-clinical models and found that PQQ-modulated stem cells derived from patients or obese animals demonstrated better therapeutic efficacy in alleviating respiratory diseases like acute allergic airway inflammation.

The work was conducted in close collaboration with Dr. Soumya Sinha Roy's group at CSIR-IGIB, and the original idea was conceived in Dr. Anurag Agrawal's lab at CSIR-IGIB.

The study, published in the peer-reviewed journal 'Cell Death & Disease' from the Nature Publishing Group, provides the first evidence, at the clinical and molecular level, of how obesity contributes to a decline in the therapeutic function of mesenchymal stem cells. The researchers hope that their findings will help identify the molecular pathway and future development of therapies for the treatment of various metabolic and obesity related diseases.

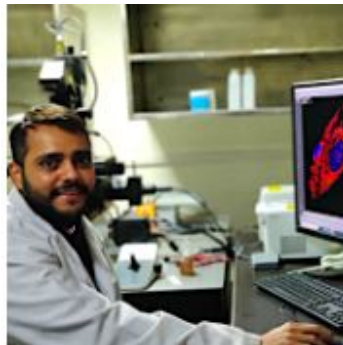
Dr. Ahmad congratulated all the authors of the study and said that metabolic disorders and obesity-related complications have increased over the years, and this study paves the way towards dealing with such complications for a better and healthier life. He also highlighted the translational potential of mesenchymal stem cells and said that these cells have remarkable potential for the treatment of a wide range of human diseases.

Along with Dr. Roy, the team also included Dr. Shakti Sagar (first author of the paper, CSIR-IGIB), Dr. Anurag Agrawal (author, previously Director, CSIR-IGIB), Gaurav Kharya (BMT Head, Apollo Hospital), and all other contributing authors.

Public Relations Office  
Jamia Millia Islamia



**Dr. Tanveer Ahmad**



**Dr. Shakti Sagar**