

# Quick Research Project for Safeguarding People and Society

## Preparing for the Next Societal Crisis

The Institute of Integrated Research has established the "Quick Research Project for Safeguarding People and Society" (abbreviated as the QR Project), where research institutions equipped with scientific and technological seeds essential for addressing social crises respond swiftly. This project was launched in January 2024 as an expansion of the "Research Project for Overcoming Coronavirus Disasters," which was initiated by the Institute of Innovative Research at the Institute of Science Tokyo (formerly Tokyo Tech) in June 2020. In the QR Project, we will gather experts with the scientific and technological seeds necessary for solving societal issues, regardless of their affiliation within or outside the university. We will conduct research in a short-term, intensive manner to swiftly address the pressing issues.

## Research Focus

**The research focus of the QR Project encompasses societal issues that require swift solutions, including unknown infectious diseases, unpredictable major earthquakes, and natural disasters, all of which demand urgent resolution, even within a day.** When urgent societal issues arise, the university harnesses its research capabilities to promptly engage in studies aimed at safeguarding people's lives and society. Additionally, ten research themes previously pursued under the "Research Project for Overcoming Coronavirus Disasters" will continue to be investigated in the QR Project.

### Current Research Themes

#### Medical Devices

- Magnetically levitated centrifugal blood pumps for ECMO
- Development of flexible near-infrared image sensors
- Remote vital sensing (Detection of human posture in a closed room)

#### Virus Removal and Inactivation

- Fast and non-contact sterilization/virus inactivation using atmospheric plasmas
- An air purification device with large capacity
- Deposition and evaluation of antibacterial and antiviral properties of DLC films

#### Diagnostics and Vaccines

- Platform for rapid development of one-pot diagnostics for combating future pandemics
- Innovative PCR method for SARS-CoV-2

#### Future Projections

- Observation of social and economic phenomena and future predictions based on mathematical models

#### Work Style Reform

- Video conferencing service that allows multiple conversations

QR Project is conducting research within the “Research Division for Immediate Response to Social Issues” at the Multidisciplinary Resilience Research Center. In times of urgent social issues, faculty members from the Research Division for Immediate Response to Social Issues, along with experts necessary for issue resolution, gather wisdom from both within and outside the university. They promptly initiate research to address the issues. Depending on the specific social issue, collaboration with the Structural Engineering Research Division and the Volcano and Earthquake Research Division and Disaster Medical Engineering Research Division is sought to aim for the selection of safe evacuation locations and the enhancement of facility safety.

