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Japan uses quantum technology for genomic medicine

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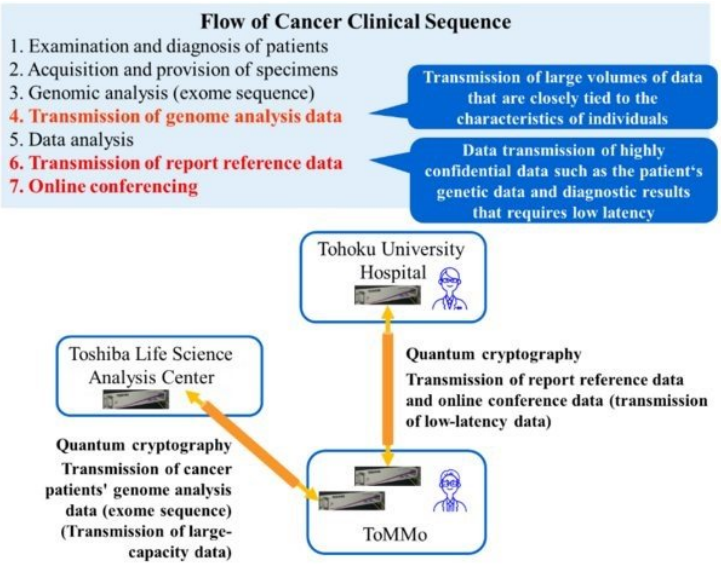
Quantum cryptographic communication technology allows for completely secure real-time transmission of genome analysis data and transfer of online expert panel data



Tokyo based Toshiba Corporation, Tohoku University Tohoku Medical Megabank Organization (ToMMo) and Tohoku University Hospital have demonstrated that quantum cryptographic communications technology can provide genomic medicine with a safe, completely secure data management environment.

This was achieved by (1) developing a system which applies quantum cryptographic communications technology to clinical sequencing, and (2) using that system to safely transmit cancer genome analysis data, via online expert panel attended by physicians and other experts to analyze the sequenced data.

This is the world's first development and demonstration of a system using quantum cryptographic communication technology in the field of genomic medicine.

Clinical sequencing is a new examination in genomic medicine that uses a next-generation sequencer to read a patient's gene sequence at ultra-high speed. The results of the genomic data analysis are then provided to physicians and other experts to assist in patient diagnosis and treatment selection. This system builds on and extends capabilities that Toshiba and ToMMo announced in January of this year, and the achievements of this demonstration are a major step toward a practical system that will provide safe and secure genomic medicine.

Toshiba will continue to work toward practical application of quantum cryptography in high-security areas, including medical, financial, and communications infrastructure. ToMMo and Tohoku University Hospital will continue close collaboration in promoting the use of safe and secure ICT technologies to support medical treatment based on genomic information.