

Invention of a new tool and technique for circular RNA identification

By Dr. Bilqeesa Bhat

A team led by Dr. Amaresh Panda at Department of Biotechnology's premier institute, the Institute of Life Sciences (ILS), Bhubaneswar has invented a pair of special primers that can help in identification of circular RNA. Circular RNA molecules are single stranded RNA which forms a closed loop which confers it with multiple properties, while as primers provide a starting point for DNA synthesis.

Furthermore, team has also developed a method know as circular RNA-Rolling Circle Amplification (circRNA-RCA), which may be used for correct identification of mature sequences in circular RNA responsible for biological functions of these molecules.

The human genome contains about twenty thousand genes which carry specific information for synthesis of different protein. With advent of new DNA and RNA sequencing technologies, scientists have successfully transcribed 85% genome into RNA. The bulk of this RNA is non-coding *i.e.*, it does not carry information for any protein synthesis.

Different non-coding RNAs discovered so far play an important role in controlling different genes responsible for normal functioning of the body. Any deregulation in these non-coding RNAs can cause multiple diseases.

Furthermore, RNA circles are large family of RNA's which are formed in various organisms including humans. They are found in abundance and remain conserved in different species. Since circular RNA molecules do not have free ends, they are stable and cannot be degraded in the cells.

New RNA sequencing technologies have helped researchers to find and quantify RNA in a biological sample at a particular time. So far more than 4 lakh circular RNAs have been identified in the human cells. However, function of only handful of circular RNAs has been documented. Circular RNAs control gene expression by acting as sponge for microRNAs and produces several peptides. They are identified with help of some unique sequence. The results of the study are published in International Journal of Molecular Sciences.

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