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Small RNA Amplification and Library Preparation (20140020, Dr. Subree Subramanian)

Technology No. 20140020

IP Status: Issued US Patent; **Application #:** 15/100,784

Small RNA Profiling

University of Minnesota researchers have developed an amplification method and library preparation process of pico-quantities of RNA. This system is the first of its kind to properly amplify small quantities of RNA as a template while still producing a highly efficient library. The amplification requires only 500pg to 5ng for a template and can capture RNA of 15 nucleotides and longer. The efficiency of preparation and amplification allows for small segments of RNA from scarce cells to be appropriately analyzed along with longer RNA fragments, which is an improvement over other methods which require small and long RNAs to be amplified and profiled in separate experiments. This library preparation of small RNA is the first to accomplish small RNA profiling and is more cost effective than current methods.

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Analysis of miRNA, endo-siRNA and piRNA

Critical disease and cellular functions are closely linked to small RNAs such as miRNAs, endo-siRNAs and piRNAs. The expression of certain RNA segments has been shown to determine the health of cells and whether they are likely to express diseased qualities. Currently, understanding of RNA is limited due to the scarcity of cells available to use in experimentation. Diseases in tissue often have trigger cells that directly contribute to the propagation of secondary cells, and these trigger cells have RNA which is of particular use in research. However, these cells are limited in number, and are therefore difficult to dissect and analyze. Amplification and library preparation methods are restricted due to the limited template RNA,

and small RNA profiles have been unable to be produced. There is a need for RNA amplification and library preparation techniques that can be applied to pico-quantities of total RNA to properly understand the role of small RNA in diseases and cell development.

BENEFITS AND FEATURES SMALL RNA AMPLIFICATION AND LIBRARY PREPARATION

- Able to amplify and analyze small RNA segments from pico-quantities of template RNA which makes the investigation of their role in cell function more easily attainable
- Produces a more thorough library with less cost than current methods
- Presents smaller fragments with longer fragments and amplifies them together to make a library for further analysis

Phase of Development Methods optimized and validated

Researchers

Subree Subramanian, PhD
Assistant Professor, Basic and Translational Research Division, Department of Surgery
External Link (www.surgery.umn.edu)
Praveensingh B Hajeri, PhD
Post-Doctoral Associate, Department of Surgery