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Media Statement

NEW DISCOVERY A CLUE TO HUMAN COMPLEXITY

In a new discovery, a young researcher from the Western Australian Institute for Medical Research (WAIMR) has helped shed light on the complexity of the human genome.

Published online in *Molecular Cell* on February 12, the new research addresses a mystery that has shrouded the sequencing of the human genome – what is the purpose of 98 per cent of our DNA?

In collaboration with two teams of researchers in the United States, WAIMR's Dr Archa Fox has pinpointed a unique role of non-coding RNA – an element included in the majority of the genome with a largely unidentified purpose.

“We have discovered that the role of ‘Neat1’, a non-coding RNA, is to be the structural foundation for paraspeckles, an important storehouse within the nucleus of every cell,” she said.

“When the human genome was mapped, it was a big surprise that only two percent of it was made up of protein-coding genes – of which there are between 20,000 to 25,000 genes.

“However, that two percent alone can't explain our complexity as humans, so the question has remained – what is the function of the remaining 98 percent of our genomes if it's not to make protein?

“In our research, we concentrated on the purpose of ‘Neat1’ – a type of non-coding RNA, and we found that its role is to create the structure for paraspeckles.”

In 2002, Dr Fox was the first to discover paraspeckles which are found in the nucleus of a cell and function like warehouses, storing the building materials for important proteins, so that when the cell places an order, the materials are released allowing proteins to be produced.

Paraspeckles provide a way for cells to more carefully control which proteins are created and therefore control cell development, and it's believed they save cells 25 minutes in processing each time they need a protein.

Unlike genes, non-coding RNA are molecules that do not help produce protein. Thanks to this new research, we now know that noncoding RNA, like proteins, can also act as a building block, to help build important parts of the cell.

The title of the paper is ‘An Architectural Role for a Nuclear Non-coding RNA: NEAT1 RNA is Essential for the Structure of Paraspeckles’ and will be printed in *Molecular Cell* on March 27, and will be available online from February 12.

Dr Fox is currently in Victoria, presenting her recent findings on paraspeckles at the Lorne Genome Conference.

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