

## News

### Genetic Code's Enigmatic Translations

Our DNA stores information of the genes in a language that is not easy to interpret. But it has been discovered by Researchers from the group of Marvin Tanenbaum at the Hubrecht Institute that it's even more abstruse than it was thought to be. The study was published in the scientific journal *Cell* on June 6th.

DNA of every cell is the same but each cell differ in functionality like brain cell or muscle cells, each has different chores. This difference depends on the genes which are active in each cell. The information stored in these genes is translated by specific translators called ribosomes. These ribosomes interpret the information stored in the genetic code and convoke proteins accordingly. Proteins are the workers in real, functioning on the basis of information collected from genes, assigned by the ribosomes. Thus, the prime part is translation of code which should be done precisely and everything will happen consequently. In case of wrong construed genetic code, parlous proteins will be produced, jeopardizing the system, resulting neurological diseases such as Huntington's disease.

Genetic code is translated in to single part of proteins, comprising groups of 3 letters, each representing a word. Ribosome should start reading from the first letter but if it starts from a wrong position, it will vary the 3 letter code. For example, if we read the sentence below it will be;

*"the man saw his new red car"*

On the other hand, if ribosome read this sentence skipping the first letter it will become;

*"hem ans awl isn ewr edc ar"*

In genetic code language, this is called 'out-of-frame' translation.

*Sanne Boersma, researcher at the Hubrecht Institute explained: "As illustrated by the example sentence, out-of-frame translation has a big effect on the protein and usually results in a protein that behaves differently and can damage the cell."* However, until yet, it is unpredictable that how the ribosome know from where to start the translation of the code and how many times they get it wrong? Researchers originated a new technique to visualize the decoding procedure of genetic information. It also enabled them to identify the colors and production of the new proteins using modified microscopy. Each visible protein was labeled using specific tags named as SunTag and MoonTag.

*Sanne Boersma: "Because of our study, we can now ask very important questions: what do all these new proteins do? Do they have important functions in our body or are they waste side-products of translation that can damage our cells?"*

Consolidating, both SunTag and MoonTag, researchers also managed to see that how often ribosome makes out-of-frame translations. It's been observed that out-of-frame translations are continual. In utmost cases, roughly half of the proteins that are produced to function use different information except the obvious code. This indicates that DNA is far more complex than what we thought of it before and encodes thousands of formerly unknown proteins and their functions.

#### Keywords:

Genetic code, ribosome, neurological diseases, Huntington's disease, SunTag, MoonTag, out-of-frame