



## Computer solves 120 year old biological regeneration mystery without the help of humans

BY **MAYA KAMATH** ON JUNE 9, 2015 SCIENCE



### Computer solves 120 year old planarian regeneration puzzle without human help

Artificial Intelligence system proved that it is capable of independently solving a mind boggling Planarian regeneration mystery which had puzzled biologists for over a century

For the first time in history, a computer programmed to develop scientific theories was able to get the solution to a 120 year old biological regeneration mystery which had puzzled biologists for over a century, without the help of any humans.

As per a recent [research article](#) published in the science journal, PLOS Computational Biology, two biologists from the Tufts University, Michael Levin and Daniel Lobo were able to give a solution to the **Planarian regeneration mystery** with the help of a computer which they had programmed in such a way that it could develop scientific theories independently without taking any help from humans. (Artificial Intelligence)

By applying **reverse engineering technique** to the Planarian regeneration mechanism, **Artificial Intelligence** succeeded in explaining the scientific theory wherein the sliced up flatworm is able to regenerate into new organism. This process is known as **Planaria** and for over hundred years scientists have been carrying out extensive genetic regeneration study to understand this weird behavior of the sliced flatworms; however they were not able to reach any particular answer to this mind boggling mystery.

Michael Levin, the lead author on the published article detailing the discovery said that vast scientific studies have been carried out for years to unveil the mystery of planarian regeneration and it took years to actually design and prepare the computer program. The duo tracked and collected all the data generated by various scientific experiments that had been carried out on the flatworm genetic problem. They then even translated the research study into proper database and thus provided the computer a ready to use raw material. Further, Levin-Lobo also prepared their personalized computer language in such a manner so that is could fit in the required data received from years of study.

The Artificial Intelligence in the machine now scanned the data which had been punched into it and then using different permutation and combination methods it started matching the worm's genes with the fed network until it found the correct match. The computer started saving this data every time whenever it got the correct match. Then it started with rest of the network until it was able to match a new study. As per Levin, just within three days the computer was able to invent an accurate model of the inner-workings of the flatworm and get solution for a century old mystery.

Levin says: "This represents the most comprehensive model of planarian regeneration found to date. While the artificial intelligence in this project did have to do a whole lot of computations, the outcome is a theory of what the worm is doing. The invention of models to explain what nature is doing is the most creative thing scientists do. . . this is the heart and soul of the scientific enterprise. None of us could have come up with this model; we (as a field) have failed to do so after over a century of effort."

He went on to add, "All this suggests to me that artificial intelligence can help with every aspect of science, not only data mining but also inference of meaning of the data."

Surprisingly, the solution to this 120 year mystery was quite a simple one which was easily understandable.

The Levin-Lobo duo have published the Planarian regeneration theory as well as the entire detail of the software that helped them solve his mystery in science journal [PLOS Computational Biology](#).

A computer scientist and biomedical engineer at the University of Massachusetts, Hava Siegelmann, though not a part of this research has applauded the the team's inventive work. Further he totally agrees with Levin's claim that this study is more than just 'statistics or number-crunching.'

The study conducted by Levin-Lobo is of utmost importance because it has unveiled the extra ordinary power of these flatworms to regenerate its body parts and thus this information can be put to use for studying human regenerative medicine.

Levin feels that such a computer driven trial and error approach can definitely help future researchers to study the complicated scientific theories which are very difficult for human brains to understand.

Levin says now he will be trying to study the complex phenomena of **Metastasis**, which means spreading of cancer throughout the body, by using the similar technique of artificial intelligence. He says: "As long as you tweak the formal language, build the database of facts in your field, and provide an appropriate simulator, the whole scheme can be used for many, many applications".



#### ABOUT AUTHOR

**MAYA KAMATH**

Content writer with unending love to pen down my thoughts and views regarding the new technological inventions as well as probe into the current affairs. Feel as if i am free bird who can actually live life at my pace.

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