Scientists make significant step towards controlling limb and appendage regeneration — thanks to worms and A.I.

BY OLIVER RETTICH | NEW YORK DAILY NEWS  | Friday June 10, 2016, 2:30 PM

The scientists have studied planarian worms to investigate tissue regeneration, and made an algorithm for the A.I. to learn to safely perform regenerative surgery.

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A study published this month by Tufts University scientists made a significant step toward controlling not only tissue regeneration, but limb and appendage regeneration as well.

For more than 150 years, researchers have studied planarian worms for this purpose. The worm possesses a simple structure and an extraordinary ability to re-grow lost body parts, making it easier for scientists to identify the genes involved and their basic roles. But how do cells leave the desired size, shape and orientation?

Tufts A.I. systems solved the riddle.

Dr. Michael Levin and Dr. Oliver Retich developed an algorithm to create "regulatory networks that control" into a virtual regenerative work with a head and tail, according to their study. Every time a simulation failed, the A.I. system learned and then again, the machine then discovered a water cloud, but without any feedback or signals. But they discovered 16 unique sequences in which a worm would need to regenerate, and just the system back to work.

After 62 hours, the A.I. finished. The result was a "compensation regulatory network of potential genes" that confirmed all previously discovered molecules, it also discovered two new proteins among the many. Not only had the algorithms used real and error logs, it also employed complex problem solving techniques.

"The outcome is a theory of what the worm is doing, and coming up with theories of what going on in nature is pretty much the most creative, scientific aspect of the scientists' jobs," Levin told phys.org. "All this suggests to me that artificial intelligence can help us with every aspect of science, not only data mining but also inference of meaning of the data."

Meanwhile, the scientists are working with the planarian worms to see how the A.I. can be used to control the regeneration process.

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