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Commentary

How Can Cells' Time Be Decelerated?

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Scientists have successfully slowed biological activities in a reversible manner. In studies, a group of scientists was able to demonstrate that cells may be moved into slow motion without changing their temperature. Such options have only been offered in the context of the theory of relativity from a physical standpoint thus far. Cells are highly dynamic, active systems that are not merely biological building components.

This research group was able to drastically reduce these dynamics using heavy water without harming the cells. Many people are familiar with heavy water because of its critical technical role in nuclear power plants. They adopted a different technique here and were able to demonstrate that in the presence of heavy water, time or, more precisely, cell dynamics can be greatly slowed.

On multiple biological levels, the investigation revealed that cell mobility and dynamics were only occurring in slow motion. It's intriguing that cellular activities can be delayed at the same temperature. Only the theory of relativity has provided such possibilities in the physical realm thus far. The findings will be used to develop a strategy for providing cells and organs with longer-lasting protection against deterioration. The findings were validated by a variety of complementary approaches, and the findings were attributed to greater interaction between structural proteins.

Hydrogen bonds are formed by heavy water as well, although they are stronger than in regular aqueous settings. As a result, structural proteins like actin appear to connect more strongly with one another and stick together for a brief period of time. What's even more impressive is that the effects are reversible, with cells reverting to their original state as soon as they're placed in a normal aqueous media.

What's more amazing is that these changes may be traced back to a passive material. Cells, on the other hand, are extremely active and far from being in thermodynamic equilibrium. They are usually dead if they behave like passive material. This was not the case in the researchers' trials, as they were able to demonstrate. They now intend to apply what they've learned to keep cells and even tissues alive for longer.

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