Fetal Movement of Individual Evolutionary Biology

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Summary: We are in preparing for the birth of a new science, Individual Evolutionary Biology.

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The stem cell is the ultimate medical weapon (Pluchino et al., 2020; Youssef et al., 2016; Pal, 2015). We have studied them for more than a half-century, but we still know only a little. Mainly, we have known there are naturally many stem cells in most tissues in an adult human body (Demarco et al., 2020), some stem cells stay quiescent and some are differentiating (Tumpel and Rudolph, 2019), the human body can potentially repair any tissue injury and regenerate any organs by utilizing the stem cell differentiation, we can reprogram a somatic cell to the original pluripotent state to get unlimited stem cells (Takahashi et al., 2007), we can potentially kill any cancers by utilizing the stem cell quiescence and apoptosis mechanism (Pan et al., 2018), the center of manipulating stem cells is the signals, which consists of a majority of chemical molecules (Tanabe, 2015) with some biophysical signals (Yim, 2012).

We are collecting more and more signals, but the progress is slow that we basically have only one mature stem cell therapy, hematopoietic stem cell transplantation (Tiwari et al., 2020, Jiang and Lian, 2020, Rangatchew et al., 2020, Grochowski et al., 2018,

Jevotovsky et al., 2018), and it is far away from manipulating autologous hematopoietic stem cells. To completely manipulate a stem cell, we need a signal dictionary about stem cells' every molecule, every stage, and every environment, to light the research in every niche.

To speed up stem cell research, we need some new tools and new methods along with the biological experiments. Computational biology is the hottest one among others. Based on big data, we can use the computer to break the material barriers and quickly get the optimal solution which is equivalent to completing hundreds of physical experiments (Bian and Cahan, 2015). One of the sharpest tools for computational biology is the quantum computer. In 2019, Google's quantum computer, with 53 qubits, completed a complex computation in 200 seconds, which would need the most powerful supercomputers 10,000 years to complete (Arute, 2019).

Another powerful tool for computational biology is Artificial Intelligence. The most powerful aspect of Artificial intelligence is its quickly self-evolving, maybe thousands of generations in a single day. Evolution, the central concept of biology, is also the central mission of Artificial intelligence.

With the combination of the quantum computer and artificial intelligence, we can expect much higher productivity in the next 50 years for stem cell science.

We want to stick to the stem cell science for future medicine because it gives us a promise of immortal life. Based on a complete signal knowledge about stem cells, we could freely manipulate all the stem cells in our body, timely repair all tissues, and

regenerate any organs in case of accidents. Theoretically, everyone could stay at the peak of life, around 18 years old, forever.

And the stem cell gives us another an even bigger promise of approaching individual perfect life. We can edit the gene in our stem cells (Trounson et al., 2019), and the new stem cells will make new body cells. In the long run, we will recreate our genes for the whole body to complete the self-evolution. Even Charles Darwin couldn't imagine this prospect because biological evolution always just talk about population evolution, can never talk about individual evolution. The advanced stem cell technology will unprecedentedly bring in individual evolution. This will be a real biological revolution, let's embrace this revolution.

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