

Reviving the Dead Brain of a Pig

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On April 17, 2019, Gina Kolata, a science and medicine journalist from The Times published the article, “‘Partly Alive’: Scientists Revive Cells in Brains from Dead Pigs” in which she reflected on the thin line that separates the dead from the living and how close the current research has gone on reviving a dead brain. She cited the research of Vršelja et al. (2019), published in Nature on the same day, where the researchers found that even after death parts of the pig brain can retain its functionality, such as blood circulation, metabolic reactions in some cells and neurons firing electrical signals (Vršelja et al., 2019). However, the researchers did not find any evidence of coordination in those activities or in other words, there were no sign of awareness or forms of intelligence that can portray the brain being alive and aware. Not only it created a paradigm shift in our understanding that part of the brains can be recovered after death, but also it raised the question if it is ethically correct to do so. In this article, we will be discussing how blurry the line between life and death can get based on the research of Vršelja et al. (2019); furthermore, discuss based on Kolata (2019), the ethical benefits of the opportunity to study a dead brain compared to a living one, and the dilemma of possible future “resuscitation”, in other words, bringing back a person from apparent death or making a Frankenstein’s monster.

Kolata (2019) emphasized on the research of neuroscientists Vršelja et al. (2019) and brought the difference in living and the dead into question. It is our general understanding that the lack of complete brain functionality, such as blood circulation, cellular activities and neural signaling is the sign of an animal or a person being dead. However, Vršelja et al. (2019) studied the brain functions of a deceased pig’s brain where experimental treatments showed activities in parts of the brain. Furthermore, Kolata (2019) used the term, “partly alive”, coined by a law and ethics professor at Duke University, Nita A. Farahany, to highlight that the line between life and death is no longer as clear as it was thought to be. This contradicted the believe that without blood circulation for even a short period of time, the brain loses its functionality, cells start dying or strictly speaking, the brain dies.

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Dead brains can be revived even partially was never proven until the team from Yale University led by Vrselja (2019), experimented on 32 pig brains that were left at room temperature, without blood circulation for hours. The team developed a chemical solution and a system that pumps the solution in the brain which is called BrainEx (Vrselja et al., 2019). The system was designed to oxygenate the brain cells but also to inhibit neural signals to ensure that, there is no slight possibility of reviving the brain to complete awareness, however, if achieved, anesthetics were on standby for immediate action. One of the leading researchers of the project, Dr. Nenand Sestan, a neuroscientist who said that we cannot call it a living brain as it lacks the functionality, but it is partially active brain at a cellular level. However, the concept is not uncommon, as previously many medical incidences showed that brain functionality can be fully restored even after prolonged lack of blood circulation such as in the case of extreme cold or clot in the vessels in the brain, as Kolata (2019) notes, “Stroke patients who had gone as long as 16 hours with a clot blocking blood to parts of the brain have regained brain function once doctors removed the clots.”

Furthermore, Kolata (2019) pointed out that the research of Vrselja et al. (2019) presents an opportunity for studying brain activities in a more ethical way. She cited Christine Grady, chief of bioethics at the N.I.H, who indicated the possibility of studying the mammalian brain properly without introducing a living animal in the experiment. Since, the experiment will be done on dead animals, there is no ethical dilemma where there is no need to consider living organisms as test subjects. “the technique may broaden the study of brain injury and cellular repair, as well as how drugs affect the brain.”, wrote Kolata (2019). In addition, since partial brain functionality can be restored, the researchers can observe the effects of different drugs on the experimented brain cells, improving or inhibiting brain activity, without harming any living organisms. Thus, this new method of study on brains after post-mortem, provide new opportunities for future human brain cells research with very little ethical drawback.

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However, the question comes when the research is developed enough when it is possible to revive the brain in its full functionality even after death. This also raises another question, when we can call an unconscious brain being conscious and alive which was instanced by a bioethicist from the University of Pennsylvania, Jonathan Monroe, in Kolata's (2019) article. Here, she tried to portray that before we can revive a brain from death, we need to know when it is not dead. She also believes that in the future when this field of study has developed enough that resuscitation becomes a possibility, we will have more ethical questions to be answered. In contrast, if we emphasize on the implementation of this research in healing damaged brain tissues caused from accidents, strokes or diseases, or revive a patient from coma by introducing the BrainEx system, we can revolutionize our medical practices when dealing with brain injuries.

In conclusion, Kolata (2019) portrays how the line between life and death is getting blurrier as development in stem cell research progresses. The rate in the development of embryonic research is very fast and soon, as Dr. Farahany puts it, it might be possible to witness resuscitation in her lifetime. Furthermore, the fruits of this research will help developing new medical practices which will provide treatment for damaged tissue and especially, the brain where a more advanced BrainEx system can be used to revive brain functionality if it shuts down due to the lack of blood circulation or damage to the neurons. As Kolata (2019) hopefully puts, "The result one day could be fewer brain-dead patients and fewer organ donors.", she aimed to realize the potential of researches for reviving a dead brain to life.

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References:

Kolata, G. (2019, April 17). 'Partly Alive': Scientists Revive Cells in Brains From Dead Pigs.

Retrieved from <https://www.nytimes.com/2019/04/17/science/brain-dead-pigs.html?searchResultPosition=17>

Vrselja, Z. et al. Nature <https://doi.org/10.1038/s41586-019-1099-1> (2019).