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A Nobel Prize That Respects Human Life

An interview with Natalia López Moratalla, professor of biochemistry at the University of Navarra, on the significance of the Nobel Prize for Medicine recently awarded to Shinya Yamanaka for his pioneering work on adult stem cells.

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The Nobel Prize for Medicine was recently awarded to the Japanese physican and researcher Shinya Yamanaka (born in Osaka, 1962),

for his pioneering work on adult stem cells, along with John B. Gurdon. They received the Nobel Prize "for the discovery that mature cells can be reprogrammed to become pluripotent." That is, they found that the specialization of the cells is reversible, thus opening a field of important therapeutic applications. Natalia López Moratalla, professor of biochemistry and molecular biology at the University of Navarra, speaks in this interview about the significance of the prize and how the research of Dr. Yamanaka has been carried out exclusively with adult stem cells, contrary to those in the scientific community who wanted to focus only on embryonic stem cells. Why is this Nobel Prize so significant?

This prize recognizes a great contribution to scientific knowledge and helps refocus an area of research

that had gone badly off track. Scientists working in this area had been trapped in ideological questions about human life, by promoting the necessity for using embryonic cells and in vitro fertilization to cure grave illnesses.

This approach enjoyed powerful ideological and financial backing that was quite successful in convincing many people that "the Catholic Church is opposed to curing disease, if this involves using embryos." Thus the discussion was shifted from the scientific domain to the religious one—even though it was known right from the beginning that embryonic stem cells were unsuited for finding cures.

How was Dr. Yamanaka able to overcome these "pressures" in his research?

In my opinion, the key to his success was not to confront those who were

doing embryonic research. He carried out his work with solid reasoning that relied on previous studies, with the decision never to use embryos, or human ova for cloning. He once said that the first time he saw an embryo he saw there his daughters. But he never got into arguments with anyone. There are two ways to obtain pluripotent cells: by destroying embryos a few days old, or by reprogramming mature cells. Dr. Yamanaka always insisted that the second is the correct way.

This discovery has resulted in books being rewritten and opened up new fields of research. Can it be called a "Copernican turn" in the history of regenerative medicine, or is that going too far?

It has opened up a field of research that will require many years of work and a lot of laboratory experiments: the "golden dream" of having

cellular models for the study of human illnesses, to test drugs and toxins, etc. We can also now dream of the real possibility, within not too many years, of curing degenerative illnesses. Already in 2012 (with gametes obtained by reprogramming and matured in vitro), we now have the first model for studying infertility and devising strategies for its possible cure.

Much work still lies ahead, and some cases will be more difficult than others. But it's now possible. I don't know if one can speak of a Copernican turn, but it is certainly an important reference point for medical research.

Faith and reason—a well-matched pair When researchers began using embryonic stem cells, it seemed that all the objections were coming from the religious sector. Nevertheless Shinya

Yamanaka has not said anything, at least publically, about any religious reasons for his decision to use only adult stem cells. What do you think lay behind his decision?

He saw it as the reasonable way to go forward. I insist that it was already known that embryonic cells had no therapeutic value. If these cells were somehow to attain the maturity needed to cure a disease, they would be rejected because they were not from the patient. Once this became clear, therapeutic cloning made its appearance: researchers strove to produce a clone embryo of each patient. Cloning with mammals received a great boost because of the sheep Dolly, which was actually a failure because the animal produced was sick and sterile, born looking old, etc. Despite thousands of attempts, no one has succeeded in

cloning a primate, just as all attempts at human cloning have failed.

Yamanaka based his initial research on knowledge about the cloning of amphibians obtained from the work of Gurdon and that was the basis for the cloning of Dolly. But he never tried to apply it to human cloning; rather it helped him to see in what measure embryonic development can be reversible.

Is this yet another proof that faith is not opposed to science and can often help us to find the true way forward?

Once again we have seen that when we work with scientific rigor (including the ethical dimension of research that seeks to know how things truly are and how they function), one's research is successful and the truth is discovered

Since he began working in this field, Dr. Yamanaka has literally been besieged by those who wanted to maintain the position that embryonic cells are indispensable for obtaining induced pluripotent stem cells. In several of his articles, he insists that this is a scientific question with no room for ideology or politics. All of his work is based on rigorous scientific reasoning. I don't know if he personally has any religious principles. But I do know that he has shown rectitude in his work as a scientist, a rectitude that comes from his ethical approach to research.

Science disposes of the means to attain real certainties in biology and its natural procedures. An ethical rationality can discover the human meaning of our biological processes. Faith adds the ultimate reason, the full meaning of human life and its dignity. This is a path of exceptional

beauty when one is seeking the truth with complete freedom.

After all the aberrations of the past century, is Dr. Yamanaka's research a good starting point for telling the scientific community that not everything is permissible?

Certainly that's true. When atomic weapons became possible, Niels Bohr (one of the pioneers of nuclear energy) admitted that if he had thought more about the consequences of his research, if he had been more prudent in speaking about it in his classes, surely many of his students would not have taken part in making the bomb. A scientist cannot say, "I do the theoretical work and leave it to the biotechnologists to apply it." There is no line of demarcation here.

At a time like the present, when disrespect for the embryo and human life is so strong, this

testimony can be a spur for many people to radically reconsider their principles.

Never before in history has there been such a falsification of data regarding the nature of the human embryo as in the second half of the twentieth century. Purely speculative data has been held up as scientific dogma (despite having been proven false) to attack the faith and the Church's perennial sexual morality, ever since Paul VI disapproved of contraceptive drugs.

A whole gamut of false assumptions has created the impression that the human embryo is not really human, supporting a false ideology that sought to be universally accepted. Moreover it has given rise to lifestyles, ways of understanding the family, etc. which, with the support of human laws, have tried to present the Church's faith as an enemy to

human progress. Given this situation, I think this Nobel Prize has a unique value.