Thesis: How Purported Scientific Failures Have Led to Advancements in IVF [1]

By: Tuoti, Whitney Alexandra Keywords: Scientific Failures and Successes [2] IVF [3] Fertilization Outside of the Body [4]

Editor's note:

Whitney Alexandra Tuoti defended her thesis titled “How Purported Scientific Failures Have Led to Advancements in IVF,” in August 2020 in front of committee members Jane Maienschein, Susan Fitzpatrick, and Carolina Abboud, earning her a Bachelor’s degree from Barrett, the Honors College. https://repository.asu.edu/items/62248 [5]

Abstract:

In vitro fertilization [6], or IVF, is currently a worldwide medical procedure designed to give infertile men and women the ability to have children of their own. An IVF procedure takes place outside of a woman’s body, often in a laboratory setting. However, before scientists used the procedure on humans [7], they initially performed IVF on animals for selective breeding and agricultural purposes. After scientists realized that the procedure had potential to become a treatment option for infertility [8], they expanded their research subjects to include using the technique on humans [7]. During the procedure’s initial development, scientists began to conduct numerous IVF trials on humans [7] that often ended in early miscarriages.

This thesis shows us the history of how some of the first attempts at IVF in humans [7] using various options such as donated egg [9] cells and cryopreserved embryos, often ended in early miscarriages. At that time, most members of the scientific community and general public responded to those trials by regarding them as insignificant. In 1998, the success rate of women under the age of 38 having children with the use of IVF was 22.1%. Over time, scientists began to acknowledge those published findings that detailed various “failed” human IVF experiments. Scientists learned to use them as a guide for what to do differently in future IVF experiments.

Because of that, scientists have since developed more effective IVF methods which have ultimately improved the procedure’s success rate. In 2016, the success rate of IVF had increased to 39.6% for women. Therefore, what we might initially think of as a “failure” is in reality not a failure at all, but rather is a “purported failure” because we can use it as a stepping-stone towards an end goal. By looking at the history of IVF research, my thesis illustrates how some of the most important science comes from acknowledging the purported failures along with the triumphant successes.

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Subject

Fertilization in vitro [10] Fertilization, In vitro [11] In vitro fertilization [12] Fertilization, Test tube [13] IVF (Reproduction) [14] Science in Literature [15] Medical Laboratory Science [16]

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