

Cloned Pugs Are Creepy, Not Cute

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The Sooam Company promises to extend the 'lifespan' of your dog through cloning. Problem is, cloning doesn't cover personality, memory, or the 'nurture' part of the nature vs. nurture equation.

Are you grieving the loss of a pet? For \$100,000 the Sooam Company will be happy to clone you a new one.

From its website: "Dogs have been domesticated for thousands of years. They have been our protectors and friends; however, an average lifespan of a dog is about 10-15 years, much shorter than that of a human being. Sooam Biotech Research Foundation is able to prolong the companionship with your dog by bringing back the memories that you have with your friend. Cloning technology is possible at Sooam for any dog no matter its age, size, and breed. Sooam not only performs dog cloning research, but we also heal the broken hearts."

I'm reminded of the RePet ad from the 2000 sci-fi action film *The 6th Day*. Cloning today is indeed amazing but it is not at the level of RePet, as could be easily interpreted from Sooam's info statement. The ambiguity is irresponsible at best, and downright predatory at worst.

Beth Shapiro is an associate professor of ecology and evolutionary biology at the University of Santa Cruz and author of *How to Clone a Mammoth: The Science of De-Extinction*. "These practices are kind of cruel because these people are paying a lot of money with the expectation that they're going to get their pet back, and they're not," she says. "They're going to get another pet that looks a lot like the one that they used to have, but it's not the same pet. It can't be, because we're more than just our DNA sequences."

First and foremost, a clone is merely a genetic copy. Memories don't make the jump. The technology of *The 6th Day*'s "syncording" is useful as a plot device, but the science of copying memories is, alas, fiction.

Shapiro offers a short science lesson on all the other reasons cloned pets are not RePets: "We (and every other living organism) are more than just the sequence of our As, Cs, Ts, and Gs that make up our genome. We are a product of our DNA sequences and the environment in which we develop and live."

For example, identical twins are naturally occurring genetic copies. "If you know identical twins that are in their 80s and 90s, you might not even know [because] they actually look different from each other," Shapiro explains. "What's different about them is the experiences they've had in life. The experiences they had in utero are going to be the same, so when they're born they'll be almost identical, but they're still different because genes express in different ways and these expression patterns are determined by stuff in our environment."

In terms of replicating environmental factors, identical twins have a leg up on Sooam's clones. "These dogs are not developing in the same mom as the original pet, so there you have your initial differences," Shapiro says. "And it just changes from there! They're not going to be born to the same mom, they're not going to have the same siblings, they're not going to be raised in the same environment, they're not going to be exposed to the same diet, and they're not going to have the same gut flora and fauna."

Humans are natural homes to a great variety of microbial life which vastly outnumber our human cells. The same is true for dogs. "We're just beginning to learn how important the things that live in our gut are to making us look and act the way we do," Shapiro explains. "There's more and more science showing us that our gut microbes can actually influence whether we're fat or skinny, or how quickly we metabolize stuff, or what kind of stuff we can metabolize. And these are all things that are not constant between a clone and [an original]. It will have exactly the same DNA, but it might not end up looking the same, and it certainly won't be the same."

This all comes down to a fact of biology called "epigenetics." Shapiro continues, "Imagine it as a suite of tags that sit on top of the DNA--and these things control which genes are on, which genes are off, and if they are on to what extent they're on. What that means is that if you have two identical twins and you separate them into different environments, they're going to be different people. They're going to look different, they're going to act different, they're going to have different likes and dislikes, and they're going to have all sorts of differences. You can't substitute one identical twin for another and say it's the same person, and the same is true of these clones."

As a twin myself, it means a lot to hear this from a geneticist. Though my brother and I are fraternal, we looked enough alike to where peers, and often mentors, expected we should act the same--or even worse, assume we were interchangeable. I shudder to think how awful it would be for a pet to be raised with a similar expectation.

by Robert Coolman

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