

## Sorry, I Am Not Your Grandfather

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### HIGHLIGHT

Recently *Cell* published an essay which claims that Robert Koch is the grandfather of cloning. However, if Koch is still alive he may say: Sorry, I am not your grandfather. Why?

### ABSTRACT

Scientific genealogy forms via inheriting essential scientific features among successive generations of scientists. When latter generations of scientists claim a great figure in the scientific history as their grandfather, they should first ask themselves whether their unique scientific characters were actually passed down from that grandfather. Robert Koch is a great microbiologist and a pioneer in emphasizing pure culture isolation for proving microbial infection. However, the isolation-derived clone of unicellular microorganisms is fundamentally different from the fusion-generated clones of multicellular organisms. In fact, modern animal cloning shared more common principle and techniques with the more ancient horticultural cloning. Thus, calling Robert Koch as the grandfather of cloning is very inappropriate.

### KEY WORDS

Cloning, Grandfather, Pioneering, Piggybacking, Robert Koch

Dear Editor:

Recently, I was awoken by someone knocking on my tomb and calling me “grandfather” (*Cell* 123:539-542, 2005). The visitor claimed to be my scientific “grandson” known as “cloner”. I must tell you that I was very surprised that I have such kind grandson. But I warmly received him because he looked so genuine in his respect to me.

I asked him why he thought that I am his grandfather. He said that my “most original contribution to basic biology is the method ..... for propagating single colonies of bacteria on plates, a technique that we would now call cloning”. Well, that was true and I am familiar with that concept of “clone”. But I had never called it as “cloning”. In fact, if you open later microbiology text books written by my true scientific sons and grandsons, you will find even them had not have such vision to call *culture purification* as “bacterial cloning”.

Then, I asked him who his father is? He replied that his fathers include Fred Griffith, Oswald Avery, Maclyn McCarty, Colin MacLeod, Max Delbruck, Alfred Hershey, Joshua Lederberg, Salvador Luria, Andre Lwoff, F. d’Herelle, E. V. Keogh, David Baltimore, Howard M. Temin, Harry Rubin, Earle, G. Gey, Puck, Harry Eagle, Georges Koehler, Cesar Milstein, R. Briggs, T. King, Paul Berg, Stanley Cohen, Herb Boyer, and Kary Mullis. Woo! How can I do not know or remember these sons? Are they some illegitimate children that were born out of my scientific wedlock? I do not think so because I was too busy then in seeking truth in my own scientific world and simply had no interest and time to do that kind of crossovers. However, as a curiosity of interest, I asked them what his fathers (my alleged sons) were doing in terms of “cloning”. He said they performed DNA cloning, virus cloning, animal cell cloning, antibody cloning, and

recombinant DNA cloning and amplification. Well, those “clonings” are somewhat different from my “cloning” but at least share some fundamental principles of isolation for purification. Even so, I felt that a genealogical linkage between me and them is a little bit over stretched. However, I would wait for the results of the DNA fingerprint tests to make my final judgment and accept my full responsibility of fatherhood for them.

Finally, I asked what he and other “grandsons” like him are doing in terms of “cloning”. He told me that they are re-creating highly similar if not totally identical multicellular individuals by replacing the nucleus of an egg with the nucleus of a somatic cell, the so-called somatic cell nuclear transfer (SCNT). It was claimed that individual grown out of such a “cloning” procedure is a copy of the nucleus-donating individual (either the same or the different individual donating the egg). What! Are you “purifying a population of multicellular sexual organisms by avoiding natural sex or, in other terms, are you forcing asexual reproduction on sexual organisms? Besides the ethical issues, have you thought of the evolutionary consequence of such cloning? Remember, an important mechanism for the evolution of organisms is by means of genetic recombination. Will the spreading of these isogenetic clones (if finally allowed in many species and at large scales) form an evolution “bottleneck” that eventually causes some catastrophic events (in biodiversity of the species and sustainability of the ecosystem? These kids are really wild!

I must say these alleged grandsons of mine are truly scientifically great and technologically capable. However, I must admit that what they are doing now is truly beyond the wildest imagination that I could have in my lifetime and even my dead time. I would also like to say that these novel developments were even beyond the knowledge horizon of their alleged fathers (my alleged sons). The scientific “genes” that they have expressed are actually different from mine: I am “purifying” a population of unicellular asexual organisms by means of *isolating* them in their *natural* reproduction; they “purifying” a population of multicellular sexual organisms by means of *replacing* their genetic information through *artificial* reproduction – *fusion* of two partial cells. My unicellular clones should all have the identical genetic information. But their multicellular clones derived from the genetically fused (nucleus DNA from the donating somatic cell and mitochondria DNA from the receiving egg) are at most highly similar in genetic information to one of their parents. Thus, my “cloning” and their “cloning”

are different not only in fundamental principles but also by actual techniques. As an honest scientist, I must declare that I am not their scientific grandfather, no matter how great values their scientific achievements may add to my honor.

I know that my declination of a genealogical relationship with them may be a disappointment to their good wish and even hurt their feeling. However, as a true scientist I must rely on the fact. I feel honored that someone is willing to be named after me. However, if an individual does not inherit my scientific “genes”, then I cannot be their scientific father or even grandfather.

By the way, if these cloners really want to find their scientific fathers and grandfathers, I suggest them to follow the line of “horticultural cloning” (<http://en.wikipedia.org/wiki/Cloning>). What the pioneers and their followers were doing in that field for multicellular plants is much more similar to what the modern cloners are doing now for multicellular animals. So why not try to ask if some of them are willing to accept the fatherhood or grandfatherhood for the modern cloners?

Interestingly, this alleged grandson of mine did look in that direction. As written by him (*Cell* 123:539-542, 2005), “the etymology of clone ..... is actually derived from the Greek, *klon*, meaning a twig or small branch. This etymology reveals the original use of the word clone to describe vegetative reproduction of plants by taking cuttings.” So apparently, this alleged grandson of mine knew that “reproductive cloning of plants ..... has been practiced for millennia by horticulturists”. Then why did he pick me as his scientific grandfather? Was it only because that I am more famous than the others? Please note how many scientific fathers (most of them are also Nobel Prize laureates) he has named!

I know that some if not many scientists now day learned that, to become successful in science, it is more important to do the right science than do the science right and it is much better to be politically right than to be scientifically true. I also noticed that some scientific journals, while rejecting and ignoring truly ground-breaking novel discoveries for decades, will immediately jump onto the band wagon of success when later those discoveries won the Nobel Prize or other honors (*Logical Biology* 6: 5, 2006). However, I must say that, as a true scientist, I despise these dishonest “scientists” and trend-following “scientific journals”.

Someone may say that my rejection of the honor to be the grandfather of cloning is not because that I am modest but coward. Well, that is actually one of the reasons for my above action. Everyone should know that taking the ownership of

something also means resuming the responsibility of it. I am denying this great honor because I wish to avoid any moral and legal responsibilities that someone later may assign to me. Years ago, when the first cloned sheep Dolly was born, I heard from radio that someone had claimed of successfully cloning cars by simply placing the VIN (vehicle identification number) from a stolen car onto another car. Recently, I was also informed of some misconduct made by some outstanding "cloners". So, if I do not make a clear declaration now, who knows what kind "grandsons" or even "grand-grand-sons" I may have in the future. Will plagiarists also call them "paper cloners" (reproducing papers of the same or similar content by changing just the authorship) and claim that I am their "grand-grand-father"?

Best regards,  
Late Robert Koch

**PS:**

I know that my letter against the current trend will not be liked by the journal which I am also criticizing in this letter. I also realize that, as a dead person, I have no real power to force my grandsons to do things against their wills. But I still wish to submit this letter because I cannot let my good name be abused.

**Disclaimer:**

The above letter was a true fabrication and total fiction. However, it may tell some truth and fact. As the fabricator of this letter, I take full responsibility for the errors it contains. But I wish all credit should be contributed to real Robert Koch because his great spirit of a true scientist is a source for inspiration and a moral support for me.

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