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The Next 50 Years of Scientific Advancement

New Scientist asked a number of prominent scientists what they thought the biggest breakthroughs would be over the next 50 years. Here is a sampling of what the biological scientists had to say:

[Sydney Brenner](#) (winner of the Nobel Prize in Physiology/Medicine for studies on organ development and cell death):

I think the most important advances will come in the understanding of the biology of the most interesting species - Homo sapiens. [. . .] However, if things do go on in the same way I predict that by about 2020 - the year of good vision - consciousness will have disappeared as a scientific problem much as embryonic determination has vanished today.

[Lewis Wolpert](#) (developmental biologist, member of the Royal Society and science popularizer):

In the next 50 years, as systems biology and computer models take over, the embryo will become fully "computable": given a fertilised egg, with the details of its genome and contents of its cytoplasm, it will be possible to predict the embryo's entire development.

[Francis Collins](#) (Director of the Human Genome Research Institute)

Genomic research will prove key to discovering how to reprogram the mechanisms that control the balance between the cell growth that causes cancer and the cell

death that leads to ageing. It is possible that a half-century from now, the most urgent question facing our society will not be "How long can humans live?" but "How long do we want to live?"

[Bruce Lahn](#) (studies [human brain evolution and stem cell biology](#)):

I anticipate that one exciting breakthrough in biomedicine will be the ability to produce unlimited supplies of transplantable human organs without the need for human donors.

[Richard Miller](#) (studies [the mechanisms of aging](#))

In aging research, the key breakthrough will be the elucidation of the molecular pathways that render cells from long-lived animals - whales, people, bats, porcupines - resistant to many forms of injury.

[Ellen Heber-Katz](#) (studies [the molecular basis of autoimmunity, wound healing and regeneration](#)):

I believe that the day is not far off when we will be able to prescribe drugs that cause severed spinal cords to heal, hearts to regenerate and lost limbs to regrow.

[Daniel Pauly](#) (Director of the Fisheries Centre at UBC)

[. . .]I think the most important development for the oceans would be a device that could detect, amplify and transmit to us the emotions and fleeting, inarticulate "thoughts" of animals in such a form as to evoke analogous emotions and thoughts in human brains.

[Elizabeth Loftus](#) (expert on [false memory syndrome](#))

Psychological scientists have learned so much about planting false memories that some say we almost have recipes for doing so. But we haven't seen anything yet. Over the next 50 years we will further master the ability to create false memories.

[Carl Djerassi](#) (helped developed the oral contraceptive pill, currently does [policy research on human fertility control](#) and writes "[science-in-fiction](#)")

The biggest breakthrough in my field will be the development of an efficient and convenient means of storing a young woman's ovarian tissue or eggs to be used years later.

See the comments of some of the other biological scientists (below) for predicted developments in understanding the brain, consciousness, evolution, cell biology, life on earth and (potentially) other planets and [more](#).

This is what science fiction authors should be incorporating into their work today!

Commenting scientists with a biological bent:

Edward O. Wilson, Paul Nurse , Frans de Waal, Niles Eldredge , Igor Aleksander, Bernard Wood, Michael Benton, Andrew Knoll, Geoffrey Miller, Stephen Pinker, Simon Baron-Cohen, Antonio Damasio, Dan Dennett, Jane Goodall, Monica Grady, Susan Greenfield, Piet Hut, Carolyn Porco, Charles Nemeroff, Alan Walker, Beverly Whipple

Check out the whole list.

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