

FRANKENSTEIN'S CAT

CUDDLING UP TO BIOTECH'S
BRAVE NEW BEASTS

EMILY ANTHES



SCIENCE

Scientists Produce Glow-in-the-Dark Cats

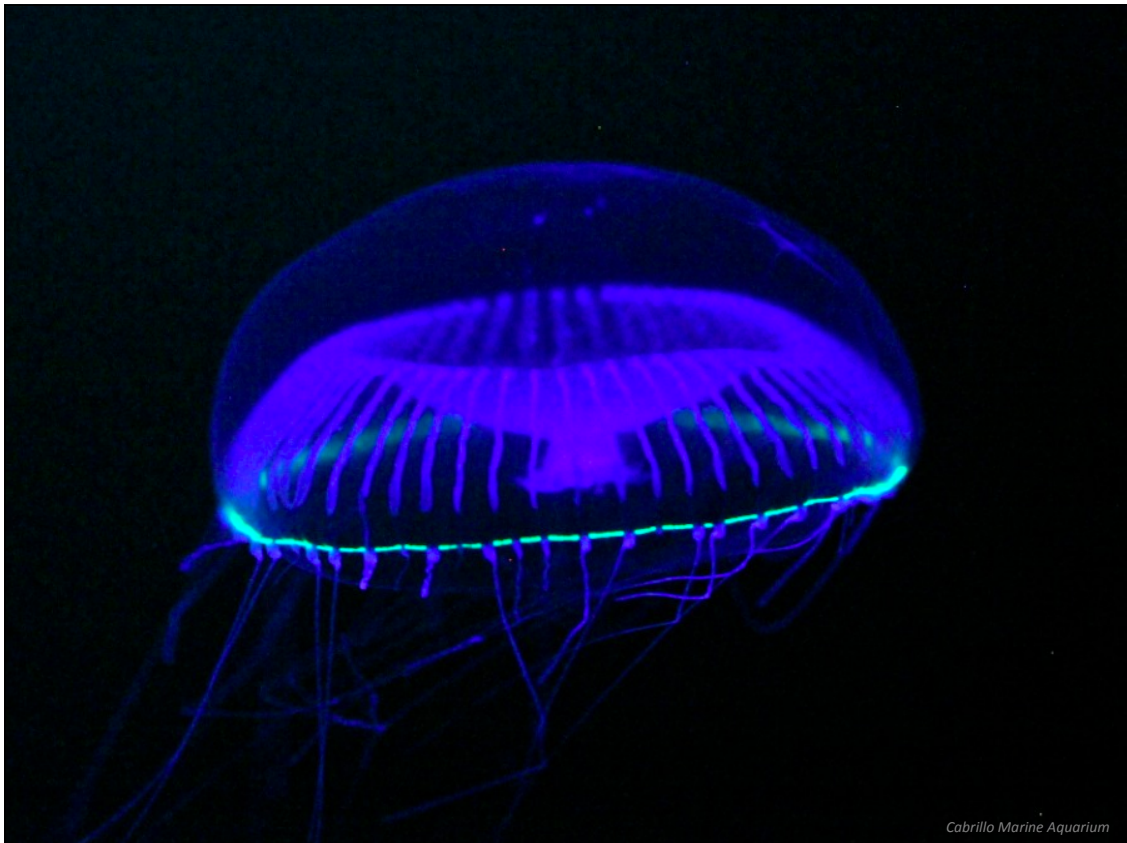
News > Science > Genetics

Synthetic biology and the rise of the 'spider-goats'

[Home](#) | [News](#) | [Back to article](#)

"Robo-rat" controlled by brain electrodes

Genetic Engineering



Green fluorescent protein (GFP)







Yorktown Technologies



Yorktown Technologies



GloFish® Aquarium Kits

Start your GloFish® fluorescent fish experience right with an easy to set up GloFish® Aquarium Kit. Each kit includes GloFish optimized blue LED lighting, sure to make your GloFish fluorescent fish really shine! For more information about GloFish Aquarium Kits, please [click here](#).



Yorktown Technologies

Would you buy GloFish?

A. Yes

B. No

Is it ethically permissible to use genetic engineering to create pets?

A. Yes

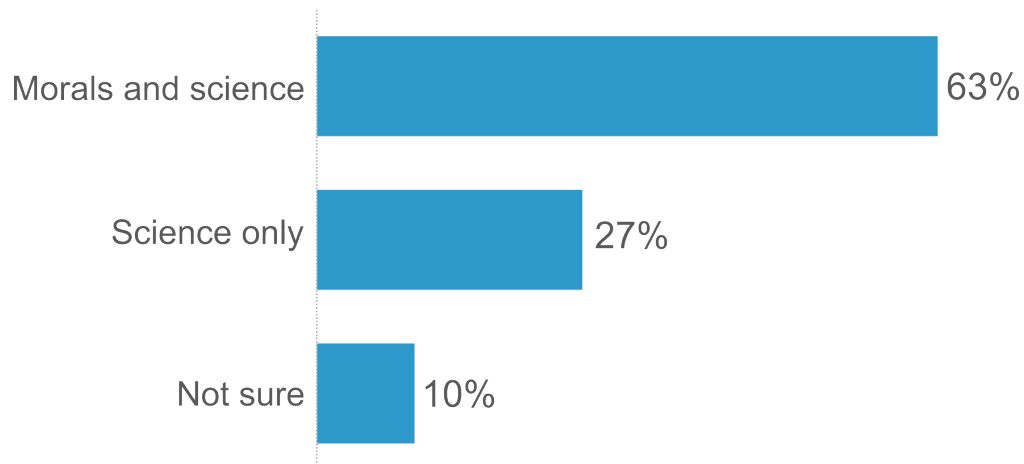
B. No

Should the government consider moral and ethical factors when regulating genetically engineered animals?

A. Yes

B. No

Morality, Science, and Animal Engineering



Adapted from The Mellman Group

"The question for me became an ethical question. Here we are, playing around with the genetic basis of life, creating new organisms that don't exist. Now it is true that we human beings have been doing that for tens of thousands of years. But I guess at the end of the day, I don't think it's right to produce a new organism just to be a pet. I look at this issue in front of us, and I think to myself, 'So, what's next? Pigs with wings? Pink horses?'

Let me be clear. I'm not opposed to genetically modified organisms. But I don't think it is a good idea to employ this technology for what I would characterize as frivolous purposes . . . To me, this seems like an abuse of the power that we have over life, and I'm not prepared to go there today."

--Sam Schuchat, California Fish & Game Commissioner

Genetic Engineering For Human Health

Find a Research Model

by name, strain, model

By Animal Type

> Rats

> Mice

> Gerbils

> Guinea Pigs

> Hamsters

> Rabbits

> Large Models

By Therapeutic Area

> Cardiovascular

> CNS

> Diabetes

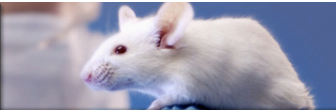
> Metabolism & Regulation

> Immunology & Inflammation

> Oncology

> Renal

Find a Model



Show only

☐ Immunodeficient

☐ Inbred

☐ Outbred

☐ Hybrid

☒ Genetically Engineered

☐ Congenic

11BHSD2 Mouse

Genetically Engineered

Ideal For:

Cardiac hypertrophy, heart failure

Bred In:

US

C57BL/6 Mouse

Inbred

Ideal For:

general multipurpose model, diet-induced obesity, transgenic/knockout model development, safety and efficacy testing, immunology

Bred In:

US , Canada , Germany , UK , Italy , France

GLUT 4 Mouse

Genetically Engineered

Ideal For:

Diabetes

Bred In:

US

GSK3B Mouse

Genetically Engineered

Ideal For:

Diabetes, glycogen regulation

Bred In:

US

HSD11B1 Mouse

Genetically Engineered

Ideal For:

Cortisone regulation

Bred In:

US

Charles River

Xenotransplantation



pharming

pharmaceutical + farming



Lysozyme

Ethics

~~*Intrinsic*~~ value

Instrumental value

Is it ethically permissible to use genetic engineering to create animal models of disease?

A. Yes

B. No

Is it ethically permissible to use genetic engineering to create pigs that will be used as organ donors?

A. Yes

B. No

Is it ethically permissible to use genetic engineering to create animals that secrete medicine in their milk?

A. Yes

B. No

Genetic Engineering For Animal Health



Gene therapy

RPE65



Foundation Fighting Blindness

"It is simply false that all genetic engineering must harm animals. Unless one assumes that all species of animals exist currently at their maximal possible state of happiness or well-being or welfare, such a claim is not legitimate."

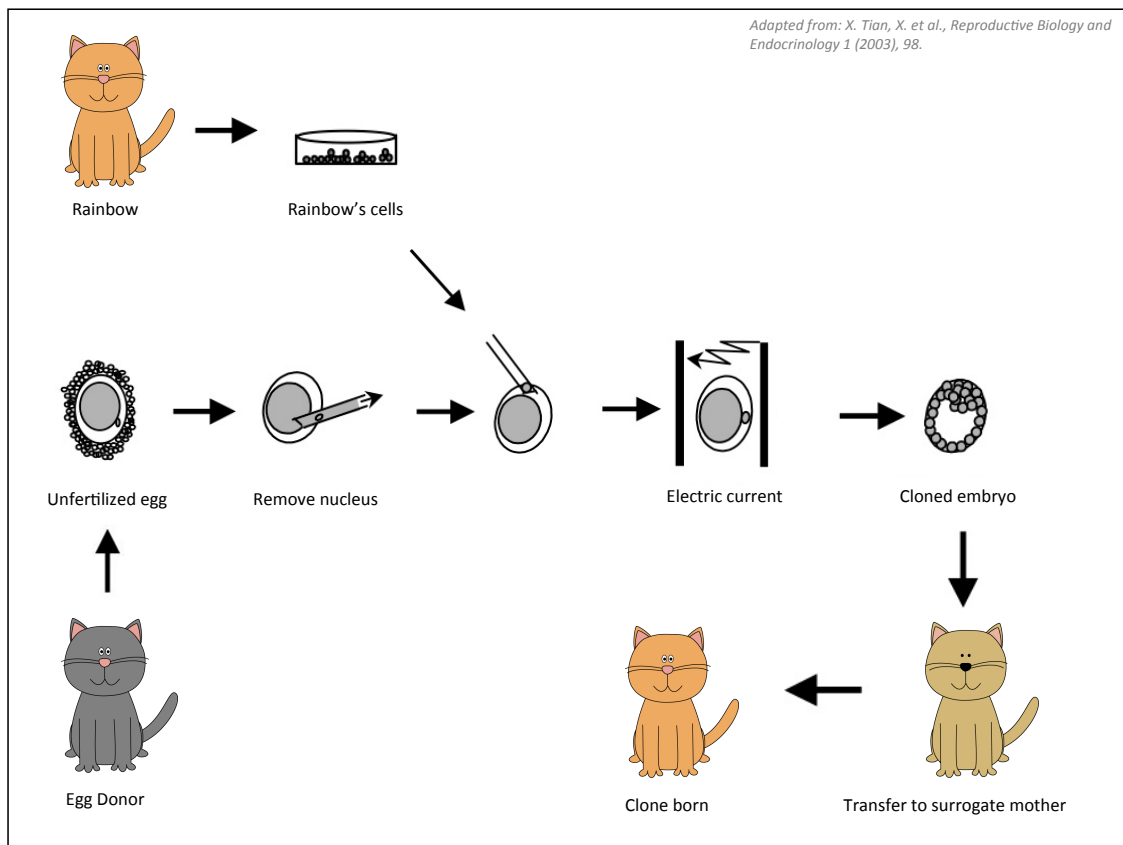
Bernard Rollin
Colorado State University

Cloning





Texas A&M University



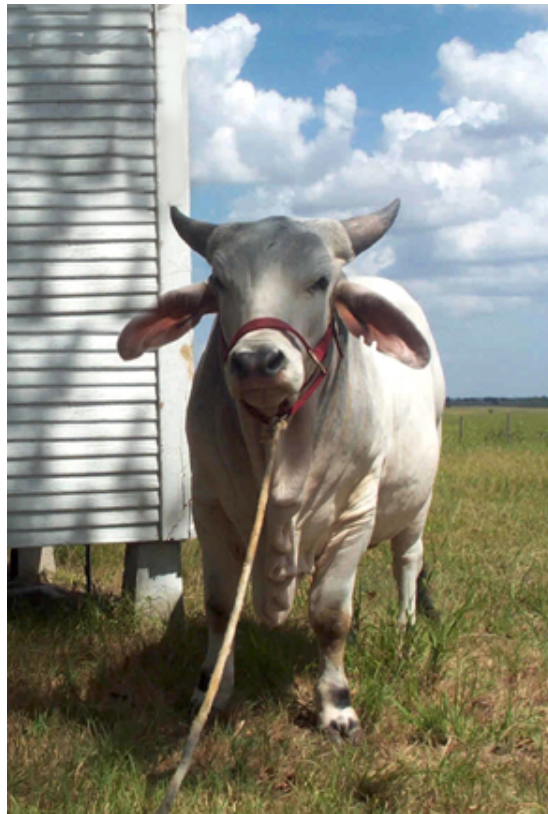


Would you clone your pet?

A. Yes

B. No





Texas A&M

Cloning is reproduction—not resurrection.

"It is unlikely that even the most obsessive pet owner would contemplate preparing more than 100 failed pregnancies for just one successful birth ... In such circumstances, the cloning of dogs for pet owners remains ethically indefensible."

Nature Editorial





Is it ethically permissible to use cloning to duplicate pets?

A. Yes

B. No

Is it ethically permissible to use cloning to duplicate endangered species?

A. Yes

B. No

Is it ethically permissible to use cloning to duplicate disease-resistant animals?

A. Yes

B. No

Prosthetics





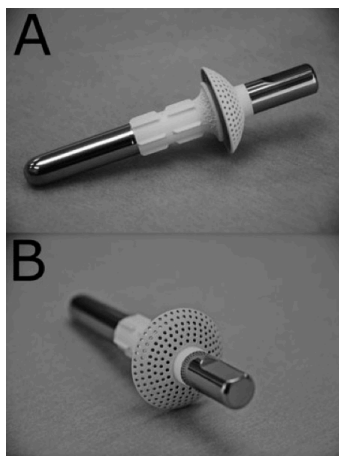
Eyes of Thailand



Birds of Prey Northwest



Intraosseous transcutaneous amputation prosthesis (ITAP)

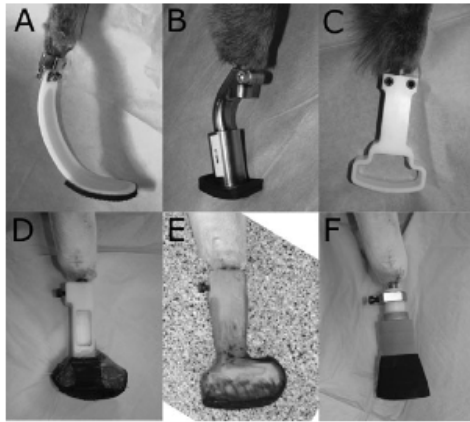




Fitzpatrick



Fitzpatrick



Fitzpatrick



Fitzpatrick





© Paul Rogers/The Times

Cyborgs



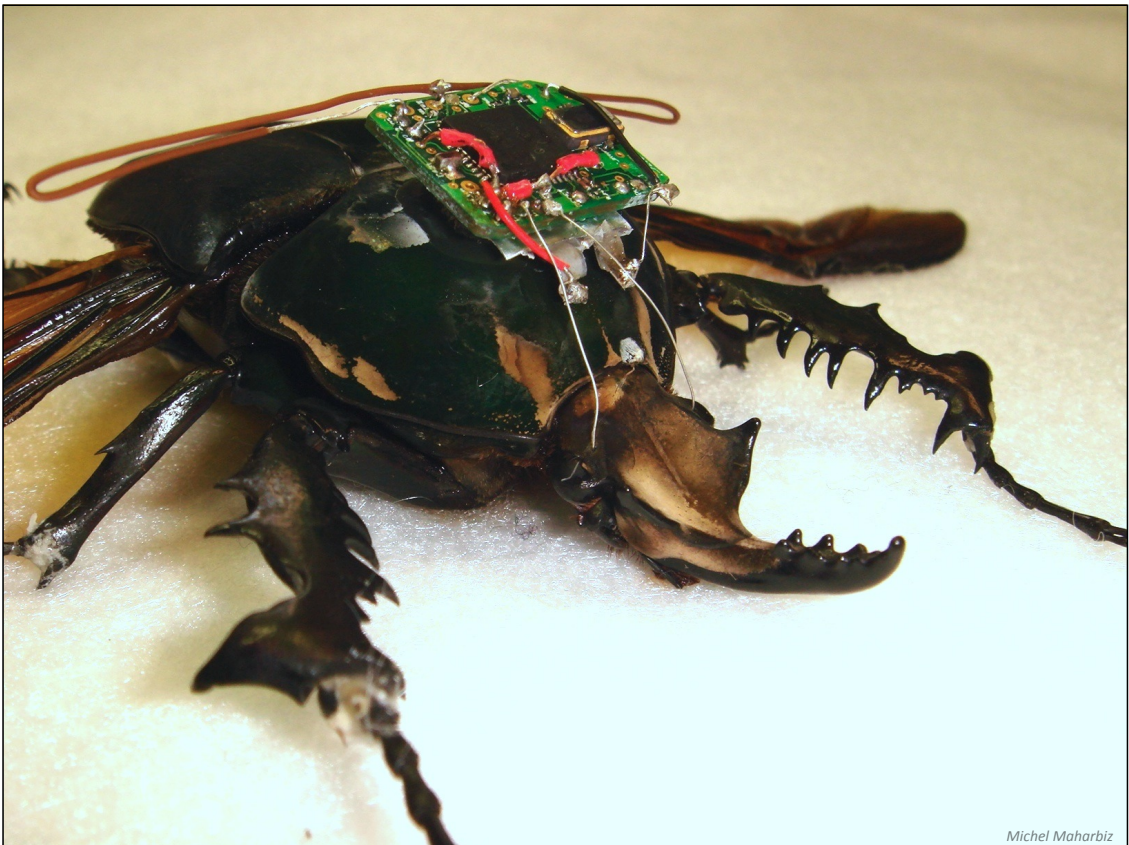
VISION

**Create technology to reliably
integrate microsystems payloads
on insects to enable insect
cyborgs**

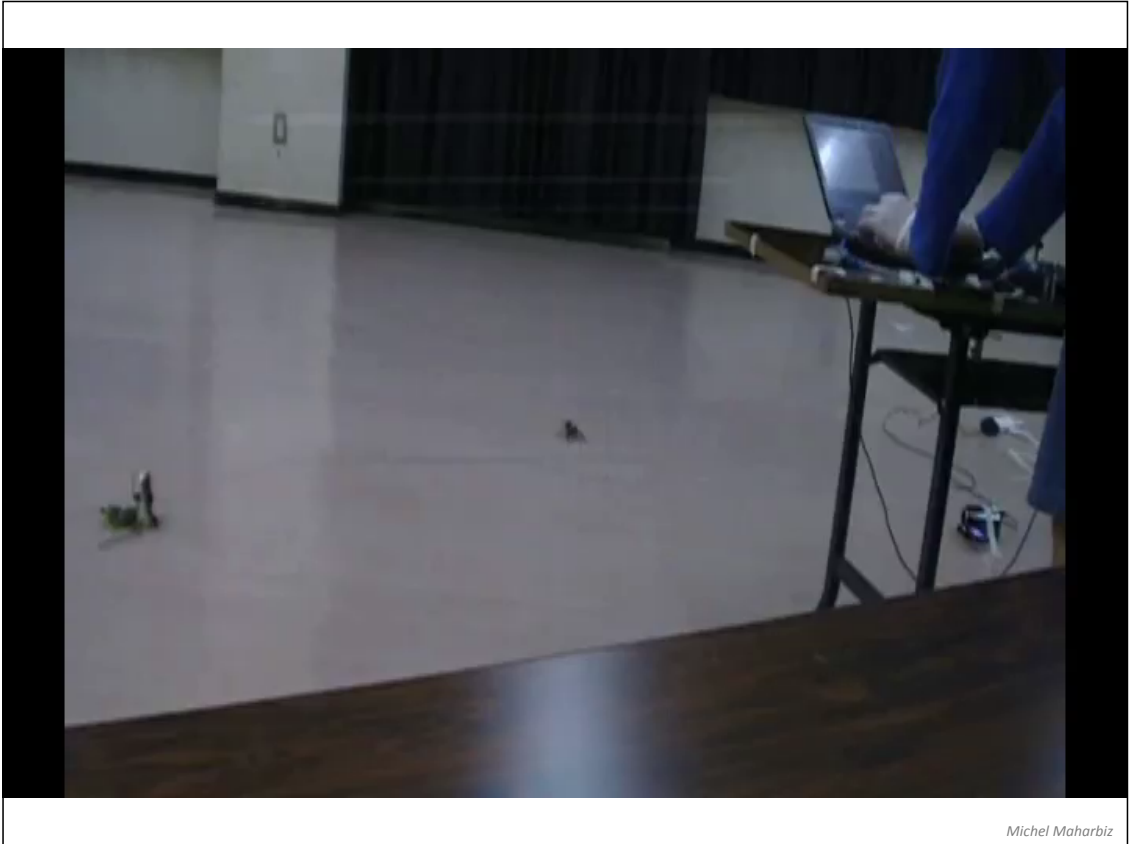




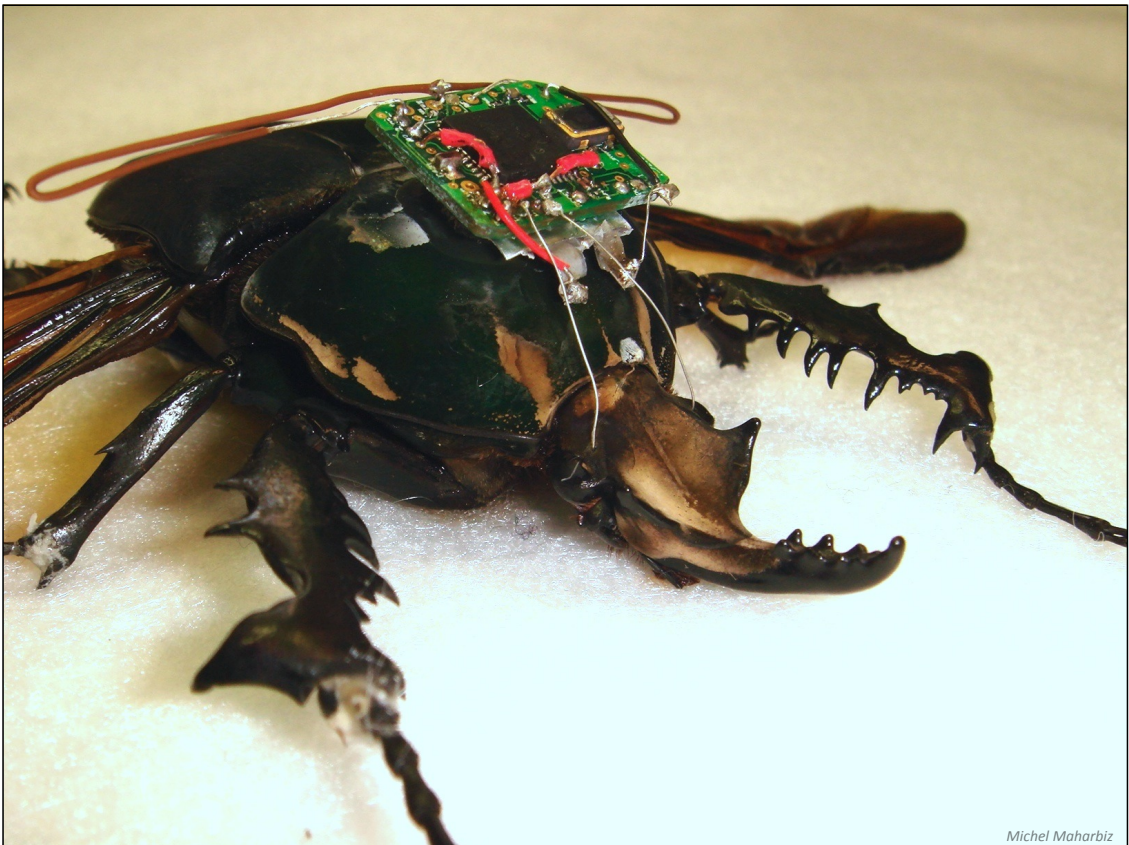
Wikimedia



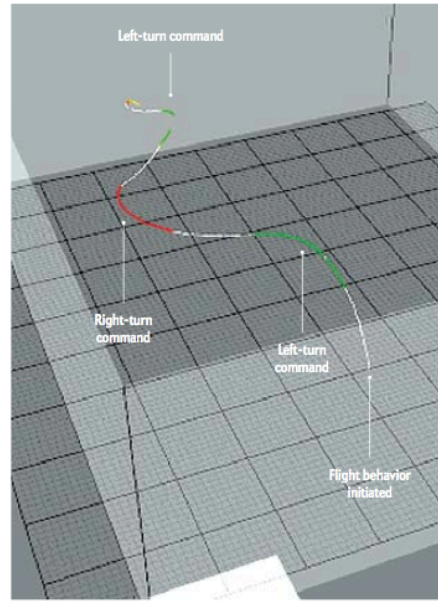
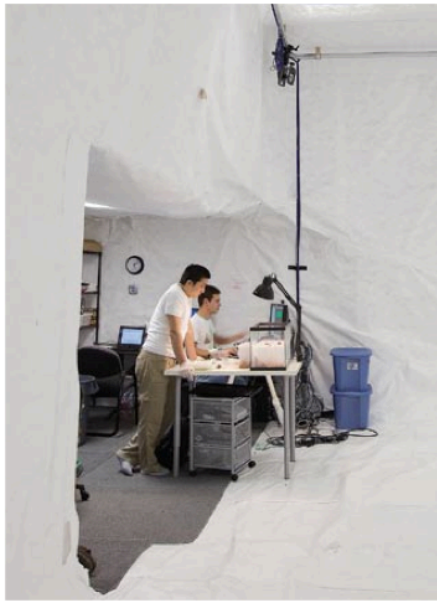
Michel Maharbiz



Michel Maharbiz



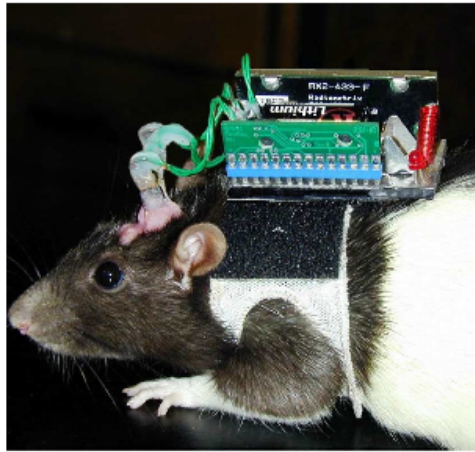
Michel Maharbiz



Scientific American



Wikimedia



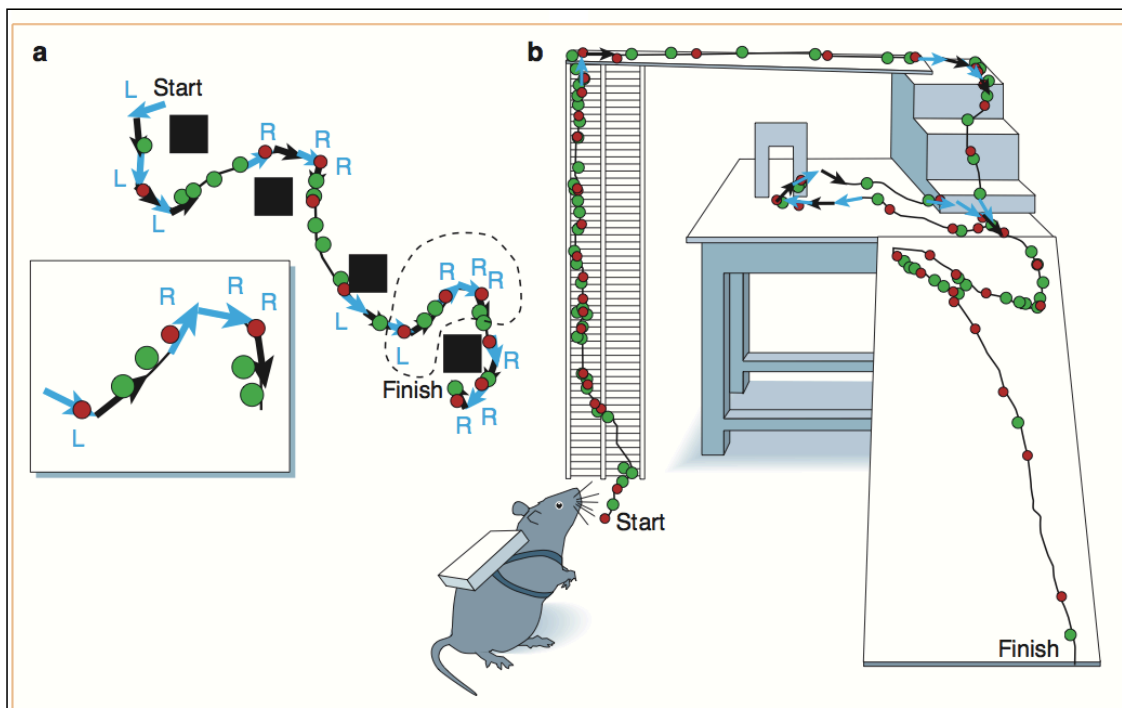
Shaohua Xu et al. 2003

To Issue Directional Commands

1. Implant wires in somatosensory cortex
2. Stimulate cortex to make rat feel like either its right whiskers or left whiskers are being touched
3. Teach rats to turn in the opposite direction

To Reward the Rats

1. Implant wires in medial forebrain bundle (MFB)
2. When rat turns in correct direction, stimulate MFB





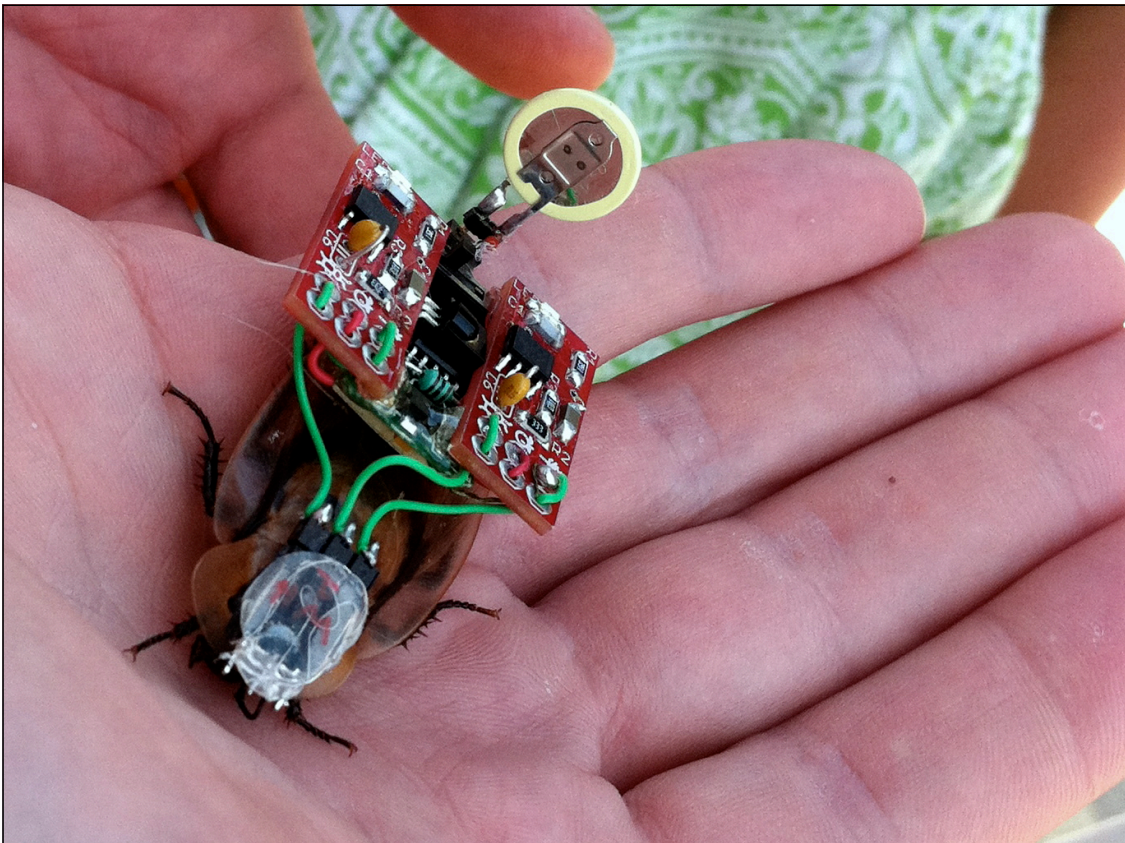
BBC

Ethics

Is it ethically permissible to create cyborg, remote-controllable animals?

A. Yes

B. No



So where do we go from here?

Thank you.

