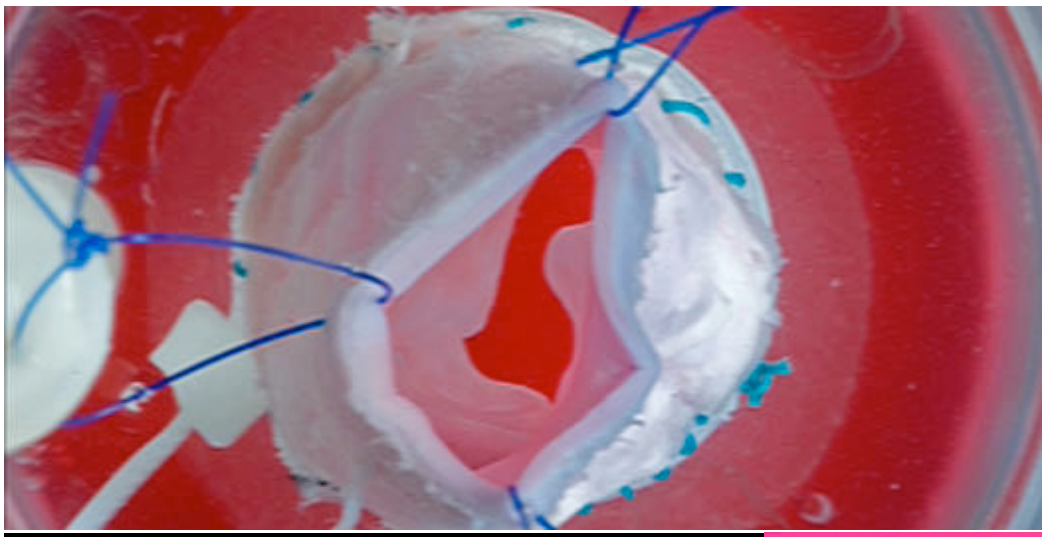
Wired Science (/kcet/wiredscience)

Features

Health

Body Builders

Tags: Health (/kcet/wiredscience/story/tag/health.html) , Medicine (/kcet/wiredscience/story/tag/medicine.html) , Biology (/kcet/wiredscience/story/tag/biology.html)



Anthony Atala bakes things that will make you feel good inside,but we're not talking cakes and muffins - we're talking human organs.

Original air date:

10.24.07

Atala, a researcher at North Carolina's Wake Forest University School of Medicine, broke new ground in medical technology when he successfully implanted seven patients with bladders grown entirely in a laboratory -- the first time such a feat has ever been accomplished. It's a significant milestone in the burgeoning field known as regenerative medicine.

Bladders are grown from a sample of the patient's own bladder tissue. Component cells are isolated, then made to propagate inside a "scaffold" - essentially a mold in the shape of the organ, coated with specialized muscle cells. This cellular dough gets baked for several weeks in an oven heated to the same temperature as the human body, until it's ready to be put inside someone. Not exactly yummy, but useful. With conventional organ transplants, there's always a major risk that the recipient's body will reject the newcomer. That risk virtually disappears with an organ grown from the patient's own genetic material.

Bladders are relatively easy; they're basically just empty bags. Atala and other scientists around the country are now working on the tougher challenge of growing complex, solid organs like livers and kidneys, as well as creating replacement blood vessels, tracheas, skin, and much more.

WIRED Science's Ziya Tong explores the latest in organ-growing techniques. And check out what the future might hold: if we can grow new parts for the inside of our body, what about the outside?

Comments

23 Posts

10.24.07 6:24 PM PDT

Bex

I have never been so amazed in my life when they began showing the bit on the HP printer. I almost cried. It was stirring that something like a 30 dollar printer could make a heart, with the right brains behind it.

10.24.07 6:41 PM PDT

lawrencebatlan

I am a retired physician-radiologist. My brother has received treatment for a form of cutaneous angiosarcoma from which he has apparently completely healed. Treatment consisted of skin grafting over the vault of the skull. In order to potentiate the eradication of the tumor, he received radiation therapy to the grafted skin. He now suffers from a localized area of skin loss measuring approx.3 or 4cm., associated now with some exudation and therefore significant discomfort. Would Dr. Atala's method of cell therapy for repair be applicable in this case and what venue could I explore to further this possibility?
Sincerely and thank you,
Lawrence Batlan

10.24.07 7:30 PM PDT

Nathan Marshall

I am a science teacher and we are studying mitosis. When I saw the HP printer process I almost fell off my chair! I have never seen something so amazing in my life. I can't wait to tell my future biologists about it!

10.24.07 8:15 PM PDT

Iti

When they said it started pumping in 4 hours I think my mind took leave of my senses. It was as if all I could see were stars upon stars upon stars.

How remarkable we are. If you can think it, it is possible.

10.24.07 9:27 PM PDT

muriel williams

I heard about inserting cells into a scaffold and growing stem cells with added jaw tissue plus nutrient in (I believe Manchester)England about 5 years ago. The scaffold was placed into the patient's body and removed when the jaw was fully grown--several weeks later. Is your method different in some way?

Many years ago, about 45 years ago, I read an article about finger regeneration in Scientific American. While working in the kitchen I accidently sliced off the end of one of my fingers. I immediately had the end of the finger stitched onto my cut finger and it regenerated perfectly--just as the Scientific American article portrayed. Your article says the gene's for such activity get turned off after birth. Can you explain?

10.24.07 9:41 PM PDT

Gerry

The HP printer building a heart that begn to pump was startling. It recalled the old "cold fusion" from kitchen materials stories of a few years ago. Except this seems true!

10.25.07 5:49 AM PDT

Sharon

I was very impressed w/ Dr Anthony Atala's "growing of organs" --- I have a close friend on kidney dialysis - This research will be of great help to many people. .... I would be willing to participate in

this research if found to be a viable candidate. I am healthy but have only one kidney as one was removed due to endometiosis not disease.

10.25.07 6:31 AM PDT

Boss Foss

Truly AMAZING! I had just heard of 3-d Printing in other applications, such as art sculptures, etc. using layers of metal or plastic to create 3-d scultpures.

Who would have ever thought of using cells to "print" body parts. Truly Inspiring. That video needs to be PUBLISHED!! Can a link to IT be put on this webpage?
People would think I am CRAZY, that I was dreaming if I attempted to describe it.

10.25.07 8:38 AM PDT

Bill Bliss

I am a retired science teacher. I spent 30 years telling my students that lower animals such as starfish could regenerate whole limbs. I further told them that humans were higher on the evolutionary scale and to complicated to do more than repair damaged tissue. I have always believed in the importance of research, but I was absolutely in SHOCK seeing what these people are able to do. The challenge for all science educators is to make seemingly complicated ideas clear and understandable to anyone. I have never seen a program (not even NOVA) do a better job in that regard than Wired Science!

10.25.07 9:58 AM PDT

Jorge V

I the best I have ever seen in my life so far, increible but is truth please support the scientics of this era

10.25.07 11:22 AM PDT

Paul Cantlie

My grand-daughter was diagnosed at the age of 16 months with a rabdosarcoma of the bladder which, after chemotherapy, was removed and replaced with a pouch fashioned from intestine, tubed to a stoma by her navel. A piece of her bladder wall was cryogenically preserved; this was nearly ten years ago. I realise there is more to plumbing in a bladder than just an empty sac but is there any chance that my 11yr old grand-daughter could hope for a repair of some sort?

10.25.07 5:23 PM PDT

Jim Parsons

Very much enjoyed the show; all were good. I think that the commentary about the new Cern Collider was interesting. I was not aware that the string theories hinged on possible experiments there. I fist heard about the string theories while an undergrad in about 1971 or so. One of my math professor was pretty exicted about the theories. He had read some of the articles that were coming out at that time and had done some of the math for himself that was being done by other folks. (Hence the excitement, I expect.) He came up with about 13 dimentions to make it all work. I understand that some of the current models have it at 11 dimentions. Heres hopping that that boson is found so that we can all go to warp 10 soon!

10.29.07 11:38 AM PDT

jay

I was viewing wired science and tune in at the last of the body building techinque for the esphogus. could you please send me an email and reveal to me where I can read an article on the technique.
Thanks Jay

10.29.07 2:01 PM PDT

hud davis

I work with a friend who recently has had several operations to remove some of her toes. She is so self-conscious about her feet now, the thought of walking on the beach never occurs anymore. What a joy it was to tell her that one day she might be able to regrow her toes!

Thank you to all the wonderful minds of our Doctors and thier staff who work so hard, and never stop trying to understand life's mysteries.

10.29.07 2:06 PM PDT

Ruth A. Beck

Hi, Dr. Anthony Atala

Congratulations in each and every effort you have put to
help people who have lost hope in some of theire complecated health problems. I personally have been having
Vitiligo skin problem since the year 1994 and the doctors have told me that it's not treatable. I am indeed desperate
Dr. Atala, kindly help me come off this condition i do cry
all the time and i am really depressed because of this condition. It's on my hands, feet and lips. For now may the lord allmighty continue to give you strength inorder to continue helping those who have lost hope like me.

Sincerely,

Ruth A. Beck

11.1.07 8:39 AM PDT

sultanfs

I would like to read articles about the technique of growing tissues.Can i get any information on this please?

11.6.07 7:40 PM PST

Roald A. Berg

Is It possible to purchase a video of episode 104 of WIRED SICENCE where It showed the growth of an artifical ESPHOGUS placed Into a human, replacing or repairing a damaged one? If this Is possible what would be the cost of the video plus shipping and handling and the procedure for doing so.

Any assistance and Information would be appreciated.

Thank you

11.22.07 7:52 PM PST

Robena

I read about this technique for producing lab grown organs several years ago. I'm glad to see this research progressing so well. Would this technique ever be applicable for complex organs like the lungs?

11.30.07 11:11 AM PST

willie henderson

I would like to recieve emails of article sent to my email.

12.12.07 7:11 PM PST

Dennis Golombek

In thinking of the use of the printer technology I can only imagine what would happen in the hands of a "mad" scientist such as Dr. Frankenstein who might also use Photoshop to create an incredible being.

12.15.07 3:02 AM PST

Robert Shaw

The possibilities derived from your reseaerch are endless! Incredible and all I can say is thanks! I personally have leukemia which means my bone marrow may die- as it has in a friend and this technology provides hope of regeneration for us!

12.17.07 9:10 AM PST

Max Clark

When will episode #104 (body builders)be aired again?

4.9.08 7:37 AM PDT

Penny

I'd like to order a liver, please.

How soon will this be possible?