

HMW DNA Isolations

The choice for Bionano IRYS mapping

BRAIN

Brain Map: President Obama Proposes First Detailed Guide of Human Brain Function

By Maia Szalavitz @maiasz | Feb. 19, 2013 | 107 Comments

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To navigate something as complex and dynamic as the brain, a map would help.

Researchers have learned an enormous amount about how we think, what drives our behaviors, and why we feel the way we do since President George H.W. Bush proclaimed the 1990s the “decade of the brain,” but many fundamental questions about the three-pound universe remain unanswered. So President Obama has proposed a Brain Activity Map (BAM) project to reveal some of these remaining secrets, using the Human Genome Project as a model. Not all scientists, however, are on board.

In his state of the union speech, the President noted that every dollar invested in the human genome project “returned \$140 to our economy.” With some \$3.8 billion spent over 13 years, the resulting gene-based boon turned out to be \$796 billion in new jobs, medical treatments, increased salaries and other benefits, according to a 2011 analysis conducted for the federal government. Although medical care has not advanced as much as initially expected because — surprise — the science of genetics is more complex than scientists had anticipated, the data is continuing to yield fruit and promises to provide more value in years to come.



REUTERS
U.S. President Barack Obama delivers his State of the Union speech on Capitol Hill in Washington D.C. on Feb. 12, 2013.

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The BAM project hopes to offer returns of equal or greater value, although the amount of funding has not yet been determined. *The New York Times* reports that scientists hope for at least as much money as was devoted to the genome project— \$300 million a year for at least ten years— but what the administration will seek as part of the proposed budget and where the money will come from is not yet clear.

The goal is to produce the first map of brain function to explore every signal sent by every cell and track how the resulting data flows through neural networks and is ultimately translated into thoughts, feelings and actions. While work is already underway to understand the wiring diagram of the whole brain— known as the connectome— this project would go beyond that to try to understand what this circuitry actually does.

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“I have been interested throughout my entire career in one burning question: how do we turn thought into action?” says John Donoghue, professor of neuroscience at Brown University, who is one of the core scientists involved in the project. Although current brain imaging techniques and cell-based studies offer some insight into how the brain works, they don’t provide a deep enough look at the brain’s inner workings.

“It’s like looking at a page of *TIME* from six feet away,” he says of imaging methods like functional MRI (fMRI). “You can get a general idea of what’s going on and maybe read the headline but you can’t [understand] the text.” Meanwhile, simply dissecting or manipulating single cells or studying several of them interacting at a time, is “like looking through a microscope and seeing every ink imperfection in a ‘T.’ Maybe you don’t want to do that if you want to understand what a paragraph says.”

What’s missing, says Donoghue, is “that middle level of analysis. How does the brain transform, ‘I want my coffee cup,’ into reaching out with my hand grabbing the cup, bringing it to my mouth and taking a sip, effortlessly, naturally, fluidly.”

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Donoghue says that the project’s lofty goal is to provide that level of analysis, in part by developing new tools needed to study neural networks to such a detailed extent. Some of the research will be done on animal models and some will require the development of nanotechnology specifically designed for the task.

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"There are already [neuroscientists] working on many aspects of this, so the first thing is to bring them together," says Donoghue. "The second thing is to bring together physical scientists like nanotechnology engineers and computational people with neuroscientists so they can exchange ideas and develop technologies to revolutionize the study of the brain."

Ultimately, researchers believe that by understanding the brain at a circuit level, diseases like Alzheimer's, schizophrenia, depression and other brain disorders could be better treated and perhaps even cured.

But some scientists are skeptical that current science is up to the task and are even more wary about whether funding a single project like BAM is the best way to gain this understanding. "I favor diversity in science, by funding lots of scientists pursuing their own research agendas, rather than funding one large project or initiative," says Ed Vul, assistant professor of psychology at the University of California San Diego, who has published research on flaws in data analysis of fMRI research. Rather than channeling funding into one, potentially misguided pathway, the individual approach "allows funding agencies to adapt nimbly to results, and to what seems to be more or less promising," Vul says.

Other researchers are concerned that the project might take resources away from trying to cure specific diseases in favor of a basic science approach that might take decades to yield treatments or cures. As Bloomberg reported, Maria Carillo, vice president for medical and scientific relations at the Alzheimer's Association said that the project should be conducted in concert with approaches like the National Alzheimer's Plan, instead of separate from them.

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Brain mapping is an exciting new area of research, as evidenced by the fact that overseas, European officials recently announced that they will spend 1 billion euro on their own major neuroscience effort, the Human Brain Project. That initiative will attempt to simulate the brain in a computer, based on existing data, rather than map its actions in finer detail. While Donoghue has reservations about the European project because he doesn't think there is enough data to build a decent model yet, he thinks that BAM might ultimately be able to provide such information.

"I predict the spinoffs will be unbelievable and amazing," he says of BAM. As long as the President can find a way to pay for it.

Maia Szalavitz @maiasz
 Maia Szalavitz is a neuroscience journalist for TIME.com and co-author of *Born for Love: Why Empathy Is Essential — and Endangered*.



Szalavitz's latest book is *Born for Love: Why Empathy Is Essential — and Endangered*. It is co-written with Dr. Bruce Perry, a leading expert in the neuroscience of child trauma and recovery.

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 **buzzreview** Oct 15, 2014
 John Donoghue is indeed intelligent, who is one of the core scientists involved in the project. Thanks for this informative post. <http://www.breastimplants-sydney.net.au/>

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lordofthefly

Apr 2, 2013

All for this kind of important research, but how will this be funded? Private money, maybe? If money needs to be moved around, I am for taking it from the defense kitty and putting it toward research. I just don't see, however, the source of this enormous kind of funding - especially since nearly 50% of Americans don't pay taxes and with The Sequester.

TIME REPORTERS: When you write about our government's initiatives, you must explain the funding part, too. This information won't be handed to you. Be a journalist. Grow some balls. Ask. Then ask again.

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BudgetAnalyst

Apr 2, 2013

The purpose of this is to build a better lie detector for interrogations. DARPA is one of the major sources of funding. Mind reading lie detectors sound like science fiction but they are real, and tons of money is being thrown at it to make it work better.

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Brainbytes

Mar 3, 2013

Research is hurting right now, especially with the new body blow called sequestration. There's no doubt we need to know more about the brain, but the question is whether this is feasible in the current fiscal reality.

<http://blog.brainfacts.org/2013/02/a-manhattan-project-to-map-the-brain/>

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BudgetAnalyst

Apr 2, 2013

@Brainbytes National defense spending is immune to fiscal reality, even at the expense of national defense.

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BoraZ @BoraZ from Twitter

28 Feb 2013

@maiasz great - I was collecting blog reaction, not sure how I missed yours.

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maiasz @maiasz from Twitter

28 Feb 2013

@BoraZ thanks Bora!!! Weird that CJR missed it, too. Wonder if we have a google issue.

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thewholetruth

Feb 28, 2013

Anti-oxidants do not work for Dementia because they do not pass the blood brain barrier. Green tea will not work for the same reason, the brain is very selective of what it allows in the cells. Researchers in 5 countries combined to reverse the memory loss of dementia and mild Alzheimer's stages with diet alone based on targeting the brain with nutrients that do pass the brain barrier

See here <http://malalzheimer.blogspot.com/2013/02/why-targeted-diet-for-dementia-is.html>

[Like](#) [Reply](#)
RN

Feb 26, 2013

rionjhsmith.blogspot.com

here is a good example of OR stuff and traumas...including brain damage...all drawn from life in the ED and OR

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Igcalle

Feb 24, 2013

This project will bring some hope for fundamentalist religious people and republicans.

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Bobolian

Feb 23, 2013

<http://www.hackandcheats.org/>

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Teda3anrirq1 @Teda3anrirq1 from Twitter

22 Feb 2013

@BrainWareSafari <http://t.co/zQst4bfa2D>

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CerebralSmartie

Feb 22, 2013

Studying the brain is crucial, but please, don't let the Big Pharma ADHD lovin' companies get their hands on this research. Make sure research is non biased. Is that possible? Doubt it.

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DerekReeves

Feb 21, 2013

Clearly...this is a nefarious plot by Prez Obama to subvert the "freedom loving" people of the world!...or so the



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bruggeman.sande
Agree. Good Plan.

Feb 21, 2013

Like Reply

bobpitt

back in the 50's and 60's research was well funded and the economy flourish, today the research funding is as low as ever being, and the US is not longer a research leader. Out of every dollar spend on research there is a huge economic reward in the shape of new business, and therefore new high paid jobs.

Feb 21, 2013

Like Reply



sp

@bobpitt should also be noted that a GOOD kindergarten teacher has the power to shape the learning habits of a child AND that translated into more money for that child:
http://www.nytimes.com/2010/07/28/business/economy/28leonhardt.html?_r=0

Feb 21, 2013

Like Reply



DerekReeves

@bobpitt

Yup...we have been coasting on this research for decades, but it will start to catch up soon...the thing about basic research is that it is done with NO tangible goal in mind, which makes it almost certainly to be avoided by corporations. A few do some research like this, Microsoft's R&D for example, but probably on a limited basis.

Feb 21, 2013

Like Reply

humtake

Of course he wants a map. He can't abuse the American legal system to oppress the people forever. He needs to find ways to control our minds before his 8 years are up so he can get us to call him Emperor.

Feb 21, 2013

Like Reply



bobpitt

@humtake here we have a good reason to have brain research done some people have none

Feb 21, 2013

Like Reply

MarkFoor

Obama just wishes he had a brain.....sorta like the scarecrow in the Wizard of Oz. Guess that makes Biden the Cowardly Lion! :D Seriously though, why spend all that money on research when they could spend it on.....I don't know, say INDIGENT HEALTH CARE?

Feb 21, 2013

Like Reply

DanitaSilver

Is bama finally trying to get a brain himself.

Feb 21, 2013

Like Reply



lgalle

@DanitaSilver I wonder how many neurons does it take to make a stupid comment like Danita's?

Feb 24, 2013

Like Reply

horseofcorff

Of course he needs it mapped, how else can he announce his new BRAIN TAX? With Obamacare he created out of thin air, a tax on EVERY medical device that costs more than \$100. ... as if health care wasn't high enough already.

Feb 21, 2013

Like Reply



lgalle

@horseofcorff This project will hopefully help people with limited intelligence like you.

Feb 24, 2013

Like Reply



horseofcorff

@lgalle @horseofcorff Isn't a person claiming to be able to judge my intelligence based on 50 words, themself displaying a lack of understanding of intelligence and how it is measured? Now my I.Q. which measures intelligence as opposed to knowledge is only 131, so yes, I do have limited intelligence, but I did have the ability to foresee that Obamacare was going to cost me my job in the health care industry and it did. I did have the ability to foresee that the act was actuarially unsound and that premiums would go up and they did. But the one thing I was wrong about was taxes. I thought my taxes would go up but they did not. I lost my job, so now I don't pay any.... tee hee! I do have to look at the bright side. And yes, I am intelligent enough to survive his administration without losing my home, because I knew he would destroy my profession and I did use those three years to pay off the mortgage before the provisions actually took effect in 2013.

Feb 24, 2013

Like Reply

CaihlynTatsu

Once again stupid adolescent jokes and insults from scientifically illiterate Americans trump any intelligent discussion on the importance of scientific research. Unless the 'spinoffs' are to improve their ability to get high, get drunk or get laid, average Americans have little to say about science.

Feb 21, 2013


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bobpitt Feb 21, 2013
 @CaihlynTatsu well said, Americans priorities are lost, being an idiot is more important than being smart.

[Like](#) [Reply](#)

kelligreensmith Feb 21, 2013
 Even Google Maps wouldn't take on the task of trying to map Obama's brain.
 A government funded brain mapping project sounds like its' likely to be as useful as Apple's IMAP app.

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RN Feb 21, 2013
 here is a blog I'm trying to get some publicity for, but it's surgical sketches from the OR, not the place to post, but hey, I figured any publicity is good publicity.

<http://rionjhsmith.blogspot.com/>

[Like](#) [Reply](#)

RN Feb 21, 2013
<http://rionjhsmith.blogspot.com/>

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ToddWest Feb 21, 2013
 Before we allow Barack and the boys to map our minds we might outta require them to come clean about the Geo-engineering projects...then decide if they can or should be able to map anything.....

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TaiSatterfield Feb 21, 2013
 1 dollar returns 140 dollars? How do they calculate that stuff?

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BrianMathies Feb 21, 2013
 @TaiSatterfield They use their brains - duh!

[Like](#) [Reply](#)



DanitaSilver Feb 21, 2013
 @BrianMathies @TaiSatterfield abama is going to fall very short on this one for sure if it requires him to have a brain. Dude you're funny.

[Like](#) [Reply](#)



bobpitt Feb 21, 2013
 @DanitaSilver @BrianMathies @TaiSatterfield Danita do you read what you post? I think you would be a beneficiary of a project such as a brain map, it would help to find yours, is obvious you have a very low intellect..

[Like](#) [Reply](#)



RodVenger Feb 21, 2013
 @TaiSatterfield They very likely have it backwards...\$140 spent yields \$1 in returns. THAT would be more in line with the realities of government. Regardless, when we're in the middle of a fiscal and debt crisis, it's not appropriate to seek new ways to spend taxpayer dollars. This is welfare for scientists.

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lennydesk Feb 21, 2013
 @TaiSatterfield For every dollar they spend on it the taxpayes have to match it with 140 dollars

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jam19611 Feb 21, 2013
 Wow. Now he's in to neurology. I guess the economic problems of this country got too boring.

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bambamm1961 Feb 21, 2013
 Why is it that Obama thinks he can pick the next new & best technology?

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CrashBox Feb 21, 2013
 FYI, in case you're thinking that a joke about Obama lacking a brain would be superduper clever and original, please read the other 8 jillion comments before posting.

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Rockett

Feb 21, 2013

Start with the shepherd. Baaaaa!

Like Reply

DavidBell

Feb 21, 2013

I suggest they start with Joe Biden. I'm curious whether there is one in there.

Like Reply



newelllondon

Feb 21, 2013

@DavidBell With Joe it'll show that the portion of it that lies is much greater than most folks.

Like Reply



DanitaSilver

Feb 21, 2013

@DavidBell not that will take to much time and money...

Like Reply

MikeLand

Feb 21, 2013

There is already a map to Obama's brain. Unfortunately for us, its an Apple navigation app. Sorry, we are headed straight to hell folks.

Like Reply

LouannOravec

Feb 21, 2013

They can start with Obama's. There won't be that much to map.

Like Reply



newelllondon

Feb 21, 2013

@LouannOravec The Fill You Full of BS portion of his brain will clearly come out on his "brain map".

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