

**BIOACTIVE IMPLANTS  
THE COST OF CRIME**

**by**

**John Sanford, Jr.  
San Francisco Police Department**

**September, 2011**

**COMMAND COLLEGE CLASS 49**

The Command College Futures Study Project is a FUTURES study of a particular emerging issue of relevance to law enforcement. Its purpose is NOT to predict the future; rather, to project a variety of possible scenarios useful for strategic planning in anticipation of the emerging landscape facing policing organizations.

This journal article was created using the futures forecasting process of Command College and its outcomes. Defining the future differs from analyzing the past, because it has not yet happened. In this article, methodologies have been used to discern useful alternatives to enhance the success of planners and leaders in their response to a range of possible future environments.

Managing the future means influencing it—creating, constraining and adapting to emerging trends and events in a way that optimizes the opportunities and minimizes the threats of relevance to the profession.

The views and conclusions expressed in the Command College Futures Project and journal article are those of the author, and are not necessarily those of the CA Commission on Peace Officer Standards and Training (POST).

© Copyright 2010

California Commission on Peace Officer Standards and Training

## **The Cost of Crime**

If I were to tell you that crime is very costly in this country, would you believe me? If I were to tell you that America locks up more people than any other country, would you believe me? If I were to tell you that America have an apparent fascination with guns and guns are the leading cause of homicides, would you believe me? What if I told you that we have scientific and technological advances that could help to drastically decrease crime, would you believe me?

Such bold questions must be asked because America still struggles to truly get a good handle on controlling crime. The Country appears to be divided in so many ways on what approach it would use to eradicate crime, however, no viable answers have proven to be the true answer to its crime problem. The questions lead to a very simple question; would we want to take a bold step? What if, by using emerging technologies in bioactive implants, we could change the equation and eliminate crime, as we know it?

This technology could be used to not only monitor criminals, but actually control crime. If we did it, crime might go away, but the social issues and unknowns make any considered use likely impossible. It may appear as if a bioactive implant is a quick fix to controlling crime, but it is highly unlikely Americans are willing to release its civil liberties even in the name of controlling crime.

### ***Bioactive Implants- What Are They?***

A bioactive implant is usually a small device (the size of two dimes or perhaps a capsule) that can be surgically inserted under the skin. Implants have been used in situations requiring surgical repair or replacements for skeletal parts such as: knees, hips, finger joints, elbows, vertebrae, teeth & mandible. According to the VeriChip Corporation, the chip can be planted under the skin to house the unit. Sometimes the chip is inserted in the triceps between the elbow

and the shoulder for easy access when scanning. These implants have become appealing to the aging population due to the manner in which they can assist to increase mobility and improve life through a sustainable control of body joints. (Heness & Ben-Nissan, 2004). Younger and middle-aged populations are taking advantage of the technology and the advancements of surgical procedures. The most prominent example of biomaterials use may be the various orthopedic implants used to complete surgery on deficient or decaying joints. Kovacik illustrates the advancements in this surgery in his article describing the work of the Texas Medical Center as one of 15 institutions in the Country that is assisting NFL players and former players with joint replacement surgery due to the degeneration and cartilage injuries. (Kovacik, 2008).

It is a hard reality, but crime and the residual effects of controlling crime are very costly. As America search for viable solutions to deal with its crime problem, manufactures will continue to develop bioactive implants. This becomes apparent with the neural implant research and RFID identification and monitoring of prisoners as mentioned as a few examples. Advocacy groups and supporters of a bioactive implant to control behavior are very likely during this endless search for action plans to control crime. “Use of devices that are surgically implanted into the brain or other parts of the nervous system is growing rapidly,” says Emily Singer in her article Growing Neural Implants (Singer, 2008).

Neural implants can recreate the auditory pathway to help the deaf hear. Implants can also stimulate nerve cells to assist patients with Parkinson’s diseases. As scientist advance work to fully integrate implants with tissue, the possibility of managing neural responses has also emerged. It is in this arena that the possibility of controlling crime rests.

Before we discuss how bioactive technology might control crime, it is important to understand exactly what they are. Biomaterials are “a non-drug substance suitable for inclusion

in systems which augment or replace the function of bodily tissues or organs.” Biomaterials are classified in one of three ways:

- Bioinert (implants with minimal interaction with surrounding tissue) bioinert implants are usually stainless steel, titanium, alumina, partially stabilized zirconia, and ultra high molecular weight polyethylene. Generally a fibrous capsule might form around bioinert implants hence its biofunctionality relies on tissue integration through the implant (Heness & Ben-Nissan, 2004)
- Bioresorbable (an implant that degrades and is eventually replaced by human tissue); and,
- Bioactive (material that interacts with surrounding tissue on a sustained basis) (Heness & Ben-Nissan, 2004).

Each of the three classes of biomaterials is used in varying degrees throughout the practice of medicine. Interestingly, they can also be used to carry personal medical information, and can also function as personal locators through the use of radio frequency technologies.

Radio Frequency Identification numbers, embedded in Radio Frequency Identification (RFID) chips, are commonly used for medical patients in emergency situations to quickly identify and read their medical history. One of the more common RFID devices is manufactured by VeriChip Corporation for implantation in the human body. The chip allows access to medical records, and can also emit frequencies to control access to secured facilities or complete payments to other electronic devices (like an ATM) (Verichip, nd). According to VeriChip, by 2008, several thousand people throughout the world had already received implants using their product (VeriChip, nd). Interestingly, the same technologies can be a significant asset in our work to fight crime.

The VeriChip has international recognition, and is widely used. It has a record of success assisting with medical history and patient identity confirmation. It has even been used to track

livestock, and has been implanted in about 1 million cats and dogs to identify lost or stolen house pets (Stein, 2004). In Mexico, the Attorney General's Office uses implants in 160 top employees to control access to high-security offices. In Spain and The Netherlands, some patron of exclusive bars use them to grant access to VIP areas. Interestingly, in his Washington Post article, writer Rob Stein noted the VeriChip is investigating other applications like "smart guns" with built-in scanners that can only be fired by someone with a corresponding implant. This is one means by which technology could be used to fight crime. Beyond gun control, there are other possible uses on the horizon.

The future of bioimplants will be quite interesting; the capabilities presented by the science arena are seemingly endless. For example, Dr. Arthur Caplan, Director of the Center of Bioethics, University of Pennsylvania recently said, "Perhaps within 25 years there will be some new ways to put information directly into our brains. With the implant technology that will be available by about 2025, doctors will be able to put something like a chip in your brain to prevent a stroke, stop a blood clot, detect an aneurysm, help your memory or treat a mental condition. You may be able to stream (digital) information through your eyes to the brain" (Caplan, 1998).

Research continues to create a bioactive implant, which opens the door to controlling influencing and dictating behaviors of the brain through their use. For example, in Dr. Theodore W. Berger's research lab at USC, they are using experimental and theoretical approaches to develop models of mammalian neural systems, to unlock the secrets of learning and memory functions. Once they study, learn and perfect the proper way the hippocampal neurons behave and exchange electrical signals, the objective is to adapt this behavior to a synthetic device; a computer chip (Pikov, 2011). Imagine the possibilities with such a chip. It could be possible to control behaviors. According to Dr. Berger, "its function will be to mimic the structure of the

nerve tissue in the hippocampus by placing multiple electrodes on an array, to listen for incoming neuron activity, and then to stimulate electrodes to deliver the appropriate output to the rest of the brain” (Berger, 2005).

The future of bioimplants that can enhance the human condition appears quite bright. As neural control of the brain becomes possible, it raises the possibility of impacting both necessary and anti-social behaviors. These advances are closer than many think. Now is the time to consider what we may want to do with them, and about them.

### ***Is America Ready for the Chip to Control Crime?***

The technologies of bioactive RFID implants can be repurposed for use to track and monitor prisoners and those under the jurisdiction of probation and parole (Geodan mobile solutions, nd). Such an implant is capable of monitoring their activities, a natural deterrent to any considered criminal conduct. It is even possible to use a neural component that can read brain waves and automatically and instantly alert the authorities when criminals are about to react on strong impulses of criminal activity (Geodan Mobile, nd.). An RFID model will allow us not only to track the individual, but also give us the opportunity via remote control to control the criminal before he or she is capable of completing the act. In addition to this level of control, it could also result in the savings of millions of dollars (and thousands of lives) in our jails and prisons.

An example of this is already taking place with the team work of Geodan mobile solutions and Oracle Corporation. The two companies’ collaborative contributions now make it possible for real-time monitoring of identification and movement location through RFID. The technology allows the monitoring of prisoners in closed-wall facilities or communities. This has

significant implication because it could cut operational cost for prison systems around the globe. Not only could this technology be used to efficiently monitor inmates and their movement while in jail, the same strategy can be used upon release to guarantee the safety of communities. On their website, Geodan notes “The key to tackling these challenges involves the use of smart information technologies that can support the goals of public safety without requiring massive budget increases...RFID combined with location technology in tamper-proof devices, provides the means to identify and locate offenders in real-time, both inside and outside closed walls. These technologies allow 24/7, anywhere, continuous, non-interfering inmate-monitoring capabilities” (Geodan Mobile, nd). Since incarceration costs America \$68 billion annually, with more than \$2.5 billion more to supervise parolees, the cost savings for this function alone are substantial. The cost if we were to use emerging neural technologies to actually prevent crime are almost beyond measurement.

### ***Employing RFID***

Certainly, Radio Frequency Identification technologies will continue to evolve. As it does, it is likely more people will relate its value to forensic usage. RFIDs are widely accepted today as a way of doing business, countries are sharing this technology and it is slowly expanding globally. RFID Xpert, a consulting firm, states “RFID is being adopted in a wide variety of industries, including aircraft manufacturing, consumer electronics, consumer packaged goods, defense, homeland security and retail” (RFID Xpert, nd). No doubt, organizations in both the public and private sector will have to adapt and adopt the RFID frenzy to remain competitive in the global market. Is it likely that law enforcement will want to keep pace. As discussed, the possibility to track felons in and out of jail is already feasible. One can extend this thought to wide-scale tracking of persons previously convicted of crimes in our communities.

## **Using a RFID Bioactive Implant for Forensic Purposes**

In the near future, we will have to choose how to, or whether to, use RFID implants to impact crime. If a chip was created that could impact the neural processes of a person contemplating crime, would we use it? For those convicted of serious and violent crimes (anyone convictions of murder, rape, aggravated assault, serious domestic violence cases, kidnappers, and predators of children) the general community sentiment would be a strong “yes”. This RFID Bioactive Chip could constantly feed law enforcement information such as the location of the felon, and also maintain a computerized history of his or her location for matching times and locations of certain crimes. It could have the ability to measure the biorhythm of these individuals to determine if their impulses grew to the level of acting on a vicious impulse. Such documentation could be solidified and presented in court as additional evidence to a given or attempted crime. With such complete monitoring and intervention capabilities, the question remains; would we do it? If we wanted to, would our citizenry allow it? Although many in society would no doubt express reservations, one of the populations most affected by crime might also express the most serious doubts as to the means by which we would wish to achieve a desired end.

### ***Likely Communities to Resist***

The African American community, which is impacted by the violence to a large degree, will most likely resist due to its mistrust in government programs. African Americans only make up 13 percent of the population, but are disproportionately represented in the prison system as 38 percent of the inmates. Many African Americans are fully aware they were introduced to America through chains and slave ships. Emerging from slavery, fighting for basic civil rights,

and enduring injustice from both the legal and medical communities, regaining the heart, soul and trust of many African Americans in this country could likely take centuries, if at all.

Professor Vernellia R. Randall of the University of Dayton School of Law, writes extensively on and speaks internationally about race, women and health care. In her book “Slavery, Segregation and Racism: Trusting the health care system ain’t always easy!” she notes that “Unlike the dominant American group, African Americans view these issues through an additional screen of fear and distrust...It is this fear and distrust that causes us to believe that the principles of bioethics: autonomy, beneficence, nonmaleficence, and justice, won’t protect our community from mistreatment and abuse” (Randall, 1996). Others outside the African American community are also already active in the fight against implants.

The AntiChips website which is a project of CASPIAS (Consumers Against Supermarket Privacy Invasion and Numbering) (AntiChips: Protest VeriChip, VeriMed, n.d.). This group is opposed to commercial tagging of people and products. They take issue with privacy rights, adverse affects, and individuals which do not have the capacity to intelligently consent on their own. On their site, they emphatically state “Medical experimentation on Alzheimer’s patients raises profound issues of informed consent. We strongly believe that cognitively impaired individuals should not be used in medical experimentation of this type” (AniChips: Protest VeriChip, VeriMed, n.d.). even with the significant improvement in society that neural implants could facilitate, current sentiment towards their use for far less invasive ends has already drawn fire from a number of fronts. The net result might be the perfect solution for a serious problem that lies unattended until the time is past to employ it.

### *Closing Remarks*

It appears America is in search for an answer to controlling crime. Bioactive implants with RFID usage makes for very interesting talks and debates. Given current opposition, and likely litigation, it is unlikely the country will allow it on a general basis. That does not mean, though, it should not be employed to track and monitor convicted felons. That alone will help in the fight against crime. Researchers will likely continue their search for cutting edge technology, resources or scientific breakthroughs to eventually give them an answer for crime. The resiliency of the country will most likely prevail in the future, but for now, bioactive implants to control crime in America most likely have no future.

### *Bibliography*

Blonder, Y. (2011, July 8) How RFID Can Safeguard Children. RFID Journal. Retrieved July 27, 2011, from [www.rfidjournal.com/article/print/8545](http://www.rfidjournal.com/article/print/8545)

Caplan, A. (1998, December 27) What Does the Future Hold?, Advanced Neural Implants and Control. Retrieved July 28, 2011, from [www.philipnute.com/pdfs/darpa.pdf](http://www.philipnute.com/pdfs/darpa.pdf)

Pikov, V. (2011, June) Hippocampus implant enhances memory formation in rats. NeuroTechZone. Retrieved July 29, 2011, from [www.neurotechreports.com](http://www.neurotechreports.com)

"Regional and State Employment and Unemployment Summary ." *U.S. Bureau of Labor Statistics*. Version USDL-11-0892. United States Department of Labor, 17 June 2011. Web. 18 July 2011. <<http://www.bls.gov/news.release/laus.nr0.htm>>.

"History of Armed & Prohibited Persons System (APPS)." *Office of the Attorney General*. State of California - Department of Justice, n.d. Web. 18 July 2011. <[http://ag.ca.gov/cms\\_attachments/press/pdfs/n2521\\_apps\\_fact\\_sheet.pdf](http://ag.ca.gov/cms_attachments/press/pdfs/n2521_apps_fact_sheet.pdf)>.

Kovacik, G. (2008, March 1). Hospital Tackles Former NFL Players' Injuries. *Texas Medical Center*. Retrieved July 25, 2011, from [www.texasmedicalcenter.org/root/en/TMCServices/News/2008/03-01/Hospital+Tackles+Former+NFL+Players+Injuries.htm](http://www.texasmedicalcenter.org/root/en/TMCServices/News/2008/03-01/Hospital+Tackles+Former+NFL+Players+Injuries.htm)

"Reducing the Dropout Rate and Helping All Students Graduate College and Career Ready." *Reducing the Dropout Rate and Helping All Students THE WHITE HOUSE Washington*. United States Department of Education, n.d. Web. 18 July 2011. <[www2.ed.gov/about/inits/list/hispanic-initiative/career-ready.pdf](http://www2.ed.gov/about/inits/list/hispanic-initiative/career-ready.pdf)>.

RFID Xpert, Retrieved July 27, 2011, from <http://rfidxpert.com/index.php?view=article&catid=1:latest-news&id=45:welcome&tmpl=>

Stein, R. (2004, October 13) Implantable Medical ID Approved By FDA. Retrieved July 28, 2011, from <http://www.washingtonpost.com/ac2/wp-dyn/admin/email>

VeriChip - Wikipedia, the free encyclopedia. (n.d.). *Wikipedia, the free encyclopedia*. Retrieved July 21, 2011, from <http://en.wikipedia.org/wiki/VeriChip>