

# NEUROWEAPONS: THE FUTURE OF WARFARE

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## ABSTRACT

Scientific and technological advancements have led to the development of neuroweapons – biochemical, pharmacological, and energy weapons capable of manipulating the human brain and central nervous system. Notable neuroweapons include pharmaceuticals that keep combatants awake for 90+ hours and acoustic weapons that paralyze or injure enemies. Increasingly, counterterrorism and terrorism forces are deploying neuroweapons to enhance and degrade the physical and psychological performance of fighters. Although neuroweapons are the future of warfare, little research exists on the subject. Drawing on qualitative methods, academic publications, and grey literature, this paper investigates (1) how counterterrorism and terrorism forces acquire and utilize neuroweapons, and (2) how neuroweapons hack into and augment the human brain via biochemical and engineering processes. Findings indicate that neuroweapons will enable counterterrorism forces to combat terrorism while also reducing collateral damage. This research also concludes that neuroweapons have ushered in a new, sixth domain of war — the human brain.

## RESULTS

Results of this research suggest that neurological weapons are redefining counterterrorism and terrorism operations. Findings also indicate that the prohibitive costs of neuroweapons position them as counterterrorism assets, meaning terrorists, insurgents, and guerrilla fighters will be targets of neurological attacks but will not be able to carry them out. Additionally, this paper concludes that neuroweapons will reduce collateral damage, including civilian casualties, the loss of cultural heritage, and the devolution of developing nations.

## THESIS

Biochemical, pharmacological, and directed energy neuroweapons represent the future of counterterrorism and terrorism operations. Neuroweapons will (1) enable state and nonstate actors to enhance and degrade the performance of combatants, and (2) provide allied forces with the means to counter terror while also preventing civilian casualties, protecting a nation's cultural treasures, and averting regression of developing nations.

## METHODOLOGY

This project utilizes qualitative research methods and is supported by a literature review of academic and grey literature as well as real-world case studies. For a complete list of sources, see References.

- *Military Neuroscience and the Coming Age of Neurowarfare*
- *Journal of Neurobiology of Learning and Memory*
- *Journal of Military Ethics*
- *From Psyops to Neurowar: What Are the Dangers?*

## CLASSIFYING NEUROWEAPONS

### NEUROPHARMACOLOGY

Drugs that influence human cognition and behaviour by re-engineering neurones, molecules, and the nervous system.

#### 1. MODAFINIL

Cognitive enhancement drug that improves soldiers' situational awareness, enhances memory, creates hyper-alertness, and allows soldiers to gain "sleep superiority over the enemy" (Krishnan, 2014). Enables soldiers to stay awake for 90+ hours.

#### 2. CAPTAGON

A mood-altering drug that, at sufficient doses, can eliminate empathy and fear and trigger violence and paranoia. Al-Qaeda and ISIS's drug of choice.

#### 3. PROPRANOLOL

Prevents users from developing emotionally charged memories and suppresses memory and fear, thus decreasing the incidence of PTSD.

### DIRECTED ENERGY WEAPONS

Utilizes energy such as micro, radio, acoustic, and electromagnetic waves to create weapons that range from fatal to nonfatal.

#### 1. ACTIVE DENIAL SYSTEM

Harnesses extremely high frequency waves to simulate the feeling of fire and "create a burning sensation on the skin" (Skelton, 2012).

#### 2. LONG RANGE ACOUSTIC DEVICE

Utilizes audible or inaudible sound frequencies to paralyze, injure, or kill enemies. Capable of emitting sounds of up to 160, 180, and 200 decibels — enough to induce nausea, body cavitation, muscle contraction, temporary vision loss, lung and organ damage, heart arrhythmia, cell deformation and death.

### BRAIN-COMPUTER INTERFACES

Technologies that connect brain waves to external devices such as computers, weapons, and drones, thus allowing humans to control machines without being physically present.

#### 1. MIND-CONTROLLED DRONE

A non-invasive headset monitors brain signals and transfers them to a drone, allowing individuals to fly the drone with their mind.

#### 2. NEURAL DUST

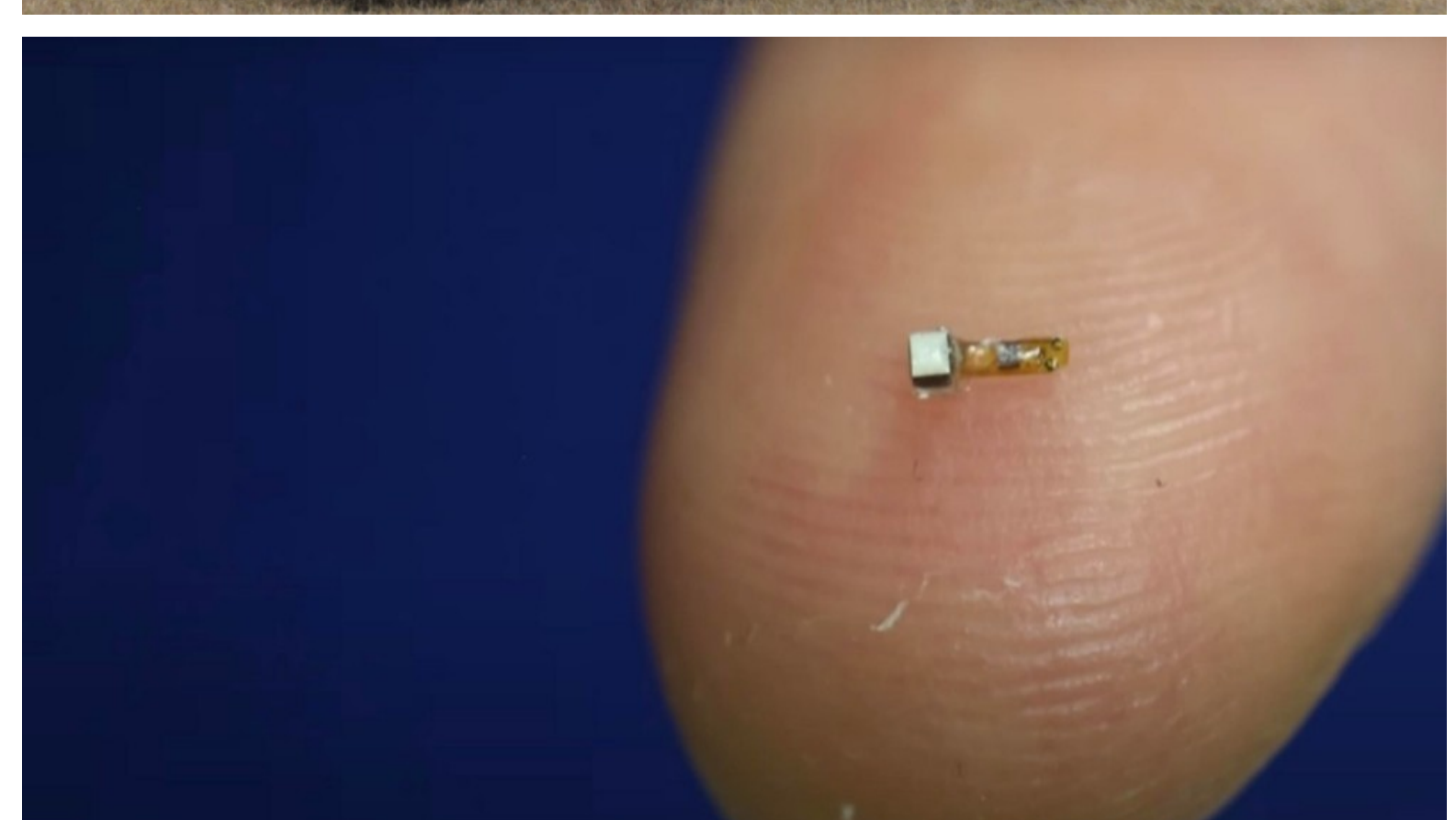
An electronic sensor the size of a grain of sand is "implanted beneath the skull, directly into the brain," creating a robust, long-distance signal between a soldier's brain and a device, such as a drone (Norris, 2020).



**CAPTAGON**  
Image from Reuters, Nikolay Doychinov



**ACTIVE DENIAL SYSTEM**  
Image from U.S. Army



**NEURAL DUST**  
Image from UC Berkeley/CC BY 3.0