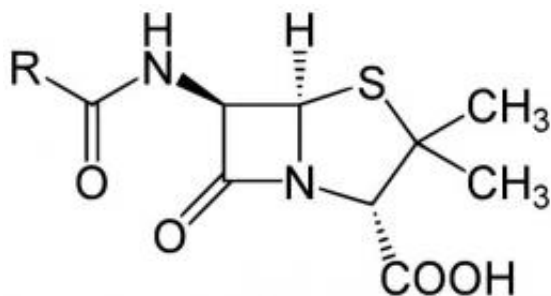


# DARPA calls for antibiotic replacement

November 23 2011, by Bob Yirka

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Penicillin, the first natural antibiotic discovered by Alexander Fleming in 1928

(Medical Xpress) -- Most everyone that has been keeping abreast of world events knows that the clock is ticking on antibiotics; bacteria have been slowly developing a resistance and development of new antibiotics has slowed to a crawl, thus the day will soon come that all of the tools we are currently using to fight bacterial infections will be lost, leaving everyone at their mercy. This problem has not gone unnoticed by those at the upper reaches of the military establishment in the United States, thus it should not come as a surprise to anyone that DARPA, via the Small Business Innovation Research (SBIR) program, has issued a [Request for Proposals](#) (RFP) to completely replace antibiotics with something new and better.

As noted in the RFP, the military has seen firsthand the problems with current antibiotics; soldiers experiencing [wounds](#) in war, especially those involved in fires, that develop bacterial infections now require triple the amount of hospital time to recover as doctors plow through a host of

[antibiotics](#) in trying to find the one that will work. Clearly frightened at the prospect of sending soldiers into battle where they may encounter bioengineered bacterial agents, the top brass has decided it's time to take another approach and to get on it now.

Instead of working to develop [new antibiotics](#), DARPA proposes the development and use of so-called nanoparticles to deliver gene altering chemicals directly to the cells of bacteria to kill them. In addition, they are hoping that someone will be able to come up with a way to make it so that the nanoparticles and chemicals they carry can be reprogrammed on-the-fly so as to combat newly evolved or created bacteria as soon as they appear. The idea is that the nanoparticles would carry something called small interfering RNA (siRNA) which are groups of molecules that would actually do the work of shutting down the genes inside the cells of the bacteria.

DARPA has laid out the project in three phases: Study what's out there now, develop the nanoparticle delivery system and siRNA, and devise a means for rapidly reprogramming them.

On its face, the project seems rather simple, after all, this is not science fiction, DARPA points out that just last year a research group used siRNA delivered by nanoparticles to kill the Ebola virus in four primates. Unfortunately, the problem is, it's not as easy as it looks, all of this science is still in its infancy and if a way can be found to do what is being asked, it likely will take years, if not decades to fully develop. The success against the Ebola virus was one agent against just one virus in a structured environment. To do what DARPA wants would mean using one technique to kill any and all bad [bacteria](#) and/or viruses. Also, if it can be done, no one really knows if the procedure would be reprogrammable, much less whether it could be done on-the-fly, so it's not really clear if anyone will be able to achieve what [DARPA](#) is asking for; though it seems for the sake of all of us, we better hope so. Turning

back the clock to a time when we were helpless against the onslaught of bacterial infections would be difficult to swallow, to say the least.

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