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BIOTERROR

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Sergei Popov

Sergei Popov today works in the United States, researching therapies to protect people against biological weapons and natural diseases. But for nearly 20 years, he was one of the Soviet Union's top scientists in the development of novel, and terrifying, biological agents.



Sergei Popov is one of thousands of former Soviet scientists with the know-how to make sophisticated biological weapons.

Here, he talks with NOVA producer Kirk Wolfinger.

NOVA: What would it take for terrorists to use biological weapons effectively?

Popov: Well, it certainly takes a lot of experience, and it requires sophisticated equipment. In my opinion the most important thing is knowledge—knowledge of how to make a specific biological agent, what is required to provide enough viability to that agent, and how to use that agent. All that was the subject of very intensive research in the Soviet Union.

NOVA: Can you describe the level of secrecy in the biological weapons program in the Soviet system?

"Some people knew just the so-called "closed legend."

Popov: It was essentially top secret research, one of the most secret in the Soviet society. [There were] multiple levels of secrecy—so that some people didn't know

anything about the true direction of research. Some people knew just the so-called "closed legend," which was specially prepared information for those

people and for the outside world.

For people involved in real BW research, information also was at different levels of security. Some people knew about the true directions of research and some people got access to government information and top secrets.

NOVA: Did you have the big picture, or was that one grade above you?

Popov: Well, I didn't know the whole picture. I didn't know the scope of research, but I had some indirect knowledge. And I realized that it was a huge, huge program which involved dozens of different institutions and facilities.

At my level, I knew what was the true purpose of the research, but sometimes I didn't know the final results of my work.

Creating "superbugs"

NOVA: What was your specialty? What was the nature of your research?

Popov: Initially I was involved in the production of synthetic genes. That means we created in tubes, in vitro, [gene] constructs that did not exist in nature. The hope was, making those constructs, it would be possible to provide bacterial agents and viruses completely new properties which they did not have in natural conditions. So, for example, a virus could produce something absolutely difficult to imagine in natural circumstances, like peptides which destroy the immune system in a very special way.

NOVA: What was your most successful work?

Popov: My most successful research was the finding that a bacteria called *Legionella* could be modified in such a way that it could induce severe nervous system disease. And the symptoms of

nervous disorders [similar to those of multiple sclerosis] would appear several days after the bacterial disease was completely "cured." So there would be no bacterial agent, but symptoms—new and unusual symptoms—would appear several days later.

"Imagine a new weapon which is difficult to diagnose initially and then which is impossible to treat with conventional antibiotics."

NOVA: What would be the point of that?

Popov: Imagine a new weapon which is difficult to diagnose initially and then which is impossible to treat with conventional antibiotics. That would be [a good weapon] from the point of view of [masking] who originated the problem.

NOVA: But why invent such things? Weren't there already in existence plenty of traditional agents—anthrax, plague, botulinum toxin—in their natural state that were deadly enough?

Popov: Certainly, there were. They are deadly enough. But the idea was that a new weapon has to have new and unusual properties, difficult to recognize, difficult to treat. And finally, it has to be a more deadly weapon. Essentially I arranged the research towards more virulent agents causing more death and more pathological symptoms.

"It was possible to create plague microbe resistant to almost 10 antibiotics, an anthrax strain which was resistant to existing vaccine."

NOVA: What was Project Bonfire?

Popov: Essentially Bonfire dealt with antibiotic-resistant strains of bacteria, and it was quite successful. It was found that it was possible to create, say, plague microbe resistant to almost 10 antibiotics. And a recombinant

strain of anthrax had resistance to 10 different antibiotics.

In addition, some research resulted in an anthrax strain which was resistant to existing vaccine, and that seems to me even more dangerous. So, essentially, it is impossible to treat that kind of strain.

NOVA: Can you describe the Hunter Program?

Popov: I didn't really work on the Hunter Program, but I know the basic directions of this research. Essentially, whole genomes of different viruses were being combined together to produce completely new hybrid viruses. They wanted to combine two microorganisms in one, say, a combination of encephalomyelitis virus and smallpox.

NOVA: What would be the advantage of that?

Popov: There could be numerous advantages. First of all, it is a completely artificial agent with new symptoms, probably with no known ways to treat it.

Essentially, the major feature would be a kind of surprise effect. Nobody would recognize it. Nobody would know how to deal with it. But nobody could predict the result of that kind of genetic manipulation.

NOVA: How far did they get?

Popov: It is very difficult to say definitely. I would say that they successfully produced several cell combinations of different viruses. And they also continued research in terms of putting certain viruses inside bacterial cells—so that a double agent, like plague and encephalomyelitis virus, could be combined in one.

"A double agent, like plague and encephalomyelitis virus, could be combined in one."

NOVA: How would that kind of "superbug" work?

Popov: Imagine a bacterial agent which contains inside its cells a virus. The virus stays silent until the bacterial cells get treated. So, if the bacterial disease gets recognized and treated with an antibiotic, there would be a release of virus. After the initial bacterial disease was completely cured, there would be an outbreak of a viral disease on top of this.

NOVA: What would be a good example of that?

Popov: A good example would be plague bacteria, which is relatively easy to treat with antibiotics, and viral encephalomyelitis inside. So, in case of biological attack, people would be treated against plague, and after that they would be sick with this viral disease of choice.

It could be encephalomyelitis. It could be smallpox. It could be ebola. Those viruses were on the list of potential agents.

A vast, uncontrollable system

NOVA: Do you think this kind of work is continuing?

Popov: I have no direct information, but I think that it may still continue—taking into account the existence of numerous Ministry of Defense facilities. We know essentially nothing about what is going on in those facilities, and as far as I know, none of them has been closed or destroyed.

"We know essentially nothing about what is going on in those facilities."

NOVA: Are you concerned that a lot of your former colleagues have gone other places and could be working for people who don't have the best intentions?

Popov: Certainly, it is a possibility. Some of my former colleagues worked in some Eastern countries. But I have no direct information right now how many of them stayed, and what kind of information they provided for those countries. But, certainly, it took place previously, and it could happen in the future.

NOVA: Does it concern you?

Popov: Yes, most certainly it does concern me, but I have no way to control these people—that kind of event.

NOVA: How big was the system that you were working in? How aggressively did the former Soviet Union pursue biological weapons?

Popov: It was a very extensive effort which involved thousands and thousands of people. As an example, the Siberian facility at Vector employed at least several thousand scientists, and among them, I would say, several hundred Ph.D.-level scientists.

"It was a very extensive effort which involved thousands and thousands of people."

And that facility wasn't alone. There were many more different facilities in the Biopreparat system and also in the Ministry of Defense system.

NOVA: Why so big? Why so aggressive?

Popov: I don't know the answer. But they definitely wanted to be the best. It was an attempt to get some kind of military advantage in this field—to gain advantage so that nobody would be stronger and nobody would be better equipped.

A reluctant warrior

NOVA: Did you agree with this mission?

Popov: No, not really. I can say that I've never believed in these kinds of weapons. I've never believed that these weapons would be used in any circumstances. Essentially, I was very skeptical about the final results of my work, but I had no choice in my career. That was the only way I could survive under those circumstances.

"I've never believed in these kinds of weapons."

NOVA: What did you think was going on with BW development in the United States? What were you told?

Popov: Well, of course, we didn't know what was going on in the United States. But we had always been told that the United States aggressively developed their own BW program and that our purpose was to catch up. So that was an official goal of our research: to create protection against American weapons and to create weapons which would be better and stronger than America's.

NOVA: When did you begin to have doubts about this?

Popov: Well, I started to doubt it after I visited Britain. I was among few people who had that kind of opportunity—to get outside and see with my own eyes how people lived in the western world and how friendly they were and how they did research.

So I got the impression that nothing serious in terms of BW development was going on in Britain or in America. I didn't have information to be certain, but I was so impressed with the western style of life that I couldn't imagine something like this could be developed in the West.

"I couldn't imagine something like this could be developed in the West."

NOVA: When did you decide that you were going to leave—to defect?

Popov: It was 1992, and everything around me collapsed at that time. The scientific research was impossible to carry on. Salaries hadn't been paid. There was no food in shops. It was a very depressing time in spite of all the changes towards democracy. Essentially, the whole country had been looted by a few people in power, and nobody cared about people like me.

But, most importantly, I realized that I wasted my time and my effort doing this research, and I didn't want to continue anymore. So that is why I decided I had to do something in my life to turn it around.

"They certainly didn't want to give me up. They still want me back."

NOVA: Was it easy for you to defect?

Popov: Well, all the previous systems which kept people inside the country didn't work anymore. So it was relatively easy to get

outside. But [once I had left], they demanded me to go back to Russia, and I decided, "I won't go back."

NOVA: So, you were still a valuable property to the Russian government? They didn't want to give you up?

Popov: No, they certainly didn't want to give me up. They still want me back. I was a person on the so-called "first list." Those persons are under special control, under special surveillance. But nobody was interested in my past in this country for many years.

A new start in America

NOVA: Tell me that story. When you came over, how quickly did the U.S. government seize upon the fact that they had a very valuable scientist in their sphere?

Popov: I came to the United States in April '92 to do research in immunology and later in pharmacology in Dallas at the Texas University Medical Center. And I spent eight years peacefully doing research in this field, and I was so happy doing it compared to what I had done in Russia.

It was only after eight years that some people debriefed me. And they were mainly concerned about the spread of biological weapons from four former Russian facilities, so they really didn't touch on my research in the past.

NOVA: Were you surprised that nobody looked into your past and figured out who you were and what you had been working on?

Popov: Well, I wasn't really

surprised. I was pleased, because I didn't want even to think anymore about what I did in Russia. I was really happy doing peaceful, really interesting research in this country.

"I didn't want even to think anymore about what I did in Russia."

NOVA: When did someone finally approach you about your past?

Popov: Essentially, I found a connection to Ken Alibek here in this company [Advanced Biosystems, Inc., where both Popov and Alibek now work]. And I decided to move from Dallas to ABS.

NOVA: And then you were finally debriefed?

Popov: Yes, then I finally was debriefed because I exposed myself at that moment.

NOVA: And were people fascinated by what you told them?

Popov: Yes, I think so. Ken Alibek already had described these directions of research in his book, *Biohazard*. But I know details about how it has been done and what has been done.

NOVA: Just one final question. What are you working on today, and how do you feel about it?

"Now I am confident I am on the right track."

Popov: Today I'm doing something which is completely opposite to what I did in my past. Essentially, I'm trying to find treatments for many different

bacterial and viral diseases by boosting human innate immune response.

It is very difficult to treat different diseases. We decided to find ways to induce so-called "unspecific immunity," which would be efficient in protecting people against quite a big range of different diseases.

The mechanic of this protection is built inside our body. There are natural proteins which induce human immunity so that people—healthy individuals—do not get sick as often as immunocompromised individuals, and that is a reflection of the capacity of the immune system. We want to increase that capacity so that we won't need, say, specific treatments for many, many diseases.

So my research right now is completely peaceful and directed towards a completely different purpose. It is directed against biological threats—to protect people from infectious diseases.

NOVA: Does that make you feel better?

Popov: I feel much, much better right now. Now I am confident I am on the right track, and I'm doing what I had wanted to do many, many years ago.

Follow the history of the U.S. biological weapons program with veteran bioweaponer [Bill Patrick](#). Or, learn about the debriefing sessions between [Bill Patrick and Ken Alibek](#).

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