

## TUNISIA

### Cooperative Activities under the SPS Programme

Tunisia has been involved in NATO science activities since 2001. In total, scientists and experts from Tunisia have had leading roles in 36 activities, and more have joined various cooperative activities as key speakers and participants.

Today, NATO science activities enable close collaboration on the two key priorities of **defence against terrorism** and **countering other threats to security** and are managed under the Science for Peace and Security (SPS) Programme. SPS activities contribute to NATO's strategic objective of

partnership, helping to connect scientists and experts from NATO countries with their counterparts from Partner and Mediterranean Dialogue countries through workshops, training courses, team collaborations and multi-year projects.

All activities supported by the SPS Programme are approved by NATO nations on the basis of consensus.



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### Examples of Activities

As part of the ongoing project “**Advanced Apparatus for Pathogen Detection**”, investigators from Tunisia, Spain, and the United States are cooperating to develop a system for the rapid detection of bacterial pathogens. This capability is of vital importance not only in biological warfare scenarios, but also in the event that biological agents are used in terrorist attacks. In addition, rapid pathogen detection methods are of great interest to the food industry and to sectors concerned with environmental control. The detection principle will be based on measuring changes either in interfacial conductivity or optical refractive index produced when the target bacteria are selectively captured by the phages and immobilized over a transducer

surface. The resulting prototype will be tested by the Biophage Pharma company. [ref 983115]

In the collaborative project “**Remediation Processes in Uranium and Other Mining Explorations**”, investigators from Tunisia, Morocco, Germany and Portugal are cooperating on a project to clean up soils contaminated with uranium and other heavy metals. Certain plants have the ability to resist toxicity by attracting metal-resistant bacteria containing active genetic elements breaking down the toxic salts, heavy metals and radioactive elements to less toxic molecules. The aim of the project is to isolate and characterize such metal-resistant bacteria, and to use them to make new

plants that can grow on the polluted soil left over from mining activities. The efficiency of new plants to stabilise heavy metals and to reduce the soil toxicity will be evaluated in laboratories and field trials, and the results will be transferred to local authorities and mine owners for reforestation and remediation of soil.

[ref 983311]

Scientists from Tunisia, Morocco, Italy, Portugal and the United Kingdom have collaborated since January 2007 on a project to identify sources of pollution in Mediterranean region and European oak forests. The plan of the project, entitled **“Elimination of Poly-Chlorinated Phenols from Forest Soils and Groundwaters”**, has been to measure the poly-chlorinated phenol (PCP) classes that are dispersed in the soil groundwater and sediments. Other chemical contaminants such as pesticides and wood preservative are also being identified. The scientists will study the effects of pollutants on these ecosystems and develop remedial strategies. [ref 981674]

Scientists from Tunisia and Belgium are collaborating on a multi-year SPS project to develop **“Novel Agents to Neutralize Toxicity of Venom Polypeptides”**. This project has included the identification of a new heavy chain antibody-based neutralizing agent and the development of therapies. Since the start of the project in May 2005, toxins from the venom of scorpions have been collected, purified and used to immunize dromedaries. An antibody library has been constructed, and all antibodies have been ranked according to their neutralizing capacity. The best nanobody will be selected according to its ability to neutralize the AaH venom. After studies are performed in animal models, a specific nanobody will

be chosen and therapeutic test procedures developed. [ref 981865]

An SPS workshop, organised by experts from Tunisia and the United Kingdom held in October 2008, brought together specialists on weather, climate and energy to exchange information on **“Weather/Climate Risk Management for the Energy Sector”**. The participants aimed to identify vulnerabilities of the energy sector to extreme weather events and climate change; to recommend ways to improve or facilitate the transfer of



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knowledge between weather/climate scientists and energy experts; and to propose improvements for using weather and climate information to warn of potential disruptions of energy operations and infrastructure. [ref 983482]