OZONE - Control and treatment of infectious diseases, for One Health

PARTNERSHIP

Background

Dermatological problems are the second most common cause of pet visits to the vet's office. The most common skin diseases are those with an infectious origin, caused by parasites, bacteria, fungi and allergic skin diseases. Among those most commonly diagnosed are superficial and deep pyoderma, flea bite and food allergy dermatitis, atopic dermatitis, scabies, non-specific dermatoses, otitis, boils and demodicosis. These are mainly caused by bacteria (Staphylococcus pseudointermediate (SP), yeast (Malassezia pachydermatis (MP) and mange mites (demodicosis and sarcoptic).

Staphylococcus pseudointermediate (SP) is also a common cause of post-surgery infections, otitis externa, eye diseases (keratitis, keratoconjunctivitis and abscesses), as the most common disorders that are difficult to treat in dogs. At present, there is a high prevalence of methicillin-resistant S. pseudintermedius (MRSP) in North America, China, Japan and Korea. Treatment of these infectious diseases of the integumentary system is primarily based on the use of antibacterial, antiparasitic and antifungal drugs, which are known to be very expensive on the international market and are generally nephrotoxic, hepatotoxic and gastrotoxic. They have also created resistance mechanisms, a serious problem that has become more evident in recent years.

Many of these antimicrobials have similar mechanisms of action as those used in human treatments, meaning that the metabolites of these drugs that are released into the environment also affect other microbial niches in water and soil, leading to the occurrence of antimicrobial resistance in strains in their natural habitat that can subsequently affect humans. Therefore, resolving and controlling these pathologies, by using safe and effective methods, has become an issue in public and veterinary health.

As a result, the search for new substances and/or safe, efficient and effective therapeutic alternatives has become the main goal of the global veterinary pharmaceutical and biotechnology industry.

Entities and roles

BENEFICIARY ENTITIES

Universidad de Panamá	Universidade Federal de Lavras
Panama	Brazil

FIRST PROVIDER ENTITIES

BioCubaFarma - Centro Nacional de Investigaciones Científicas

Cuba

SECOND PROVIDER ENTITIES

Instituto de la Grasa

Spain

Development challenges

The increase in infectious diseases in humans and animals caused by multi-drug resistant microorganisms is putting the international community on alert. The occurrence of multi-drug resistance is more prevalent in developing countries, where they must also procure the necessary drugs to combat these diseases by importing and purchasing from large transnational pharmaceutical companies.

Alternative therapies, such as ozone therapy (the use of ozone gas and ozonated oils), are a viable, affordable and safe alternative. However, obtaining and registering formulations for veterinary use requires extensive chemical-physical and microbiological studies, to be carried out by qualified personnel who must be trained to perform these tests.

The CNIC has extensive experience in the development of formulations based on ozonated plant oils used as an active pharmaceutical ingredient (API) for the treatment of infections for topical and gastric use. These medicinal products are registered by the CNIC for human and veterinary use. During the COVID-19 pandemic, the CNIC conducted clinical trials for treatment of this illness by means of ozone therapy for patients and those recovering.

This project was developed under the WHO concept of One Health, where human, animal and plant health are interdependent and linked to the ecosystems in which they live.

PROJECT

This Triangular Cooperation project aims to educate and train veterinary health personnel and researchers involved in the development of new medicines for human and veterinary use, under the concept of One Health.

Triangular approach

This project aims to address the need for new pharmaceutical products for veterinary use, which are much needed in the region, and to create new effective and inexpensive therapeutic options through professional training.

The Instituto de la Grasa (Seville, Spain) is world-renowned in the characterisation of oils and fats. Its staff are highly experienced and equipped with state-of-the-art equipment for the characterisation of ozonated oils. The young people trained in these laboratories acquire the most advanced knowledge in the characterisation of these substances.

They also have laboratories for biological studies where tests are used without animal cruelty or the use of animals for experimentation, thus reducing costs and complying with international regulations.

Sectoral approach - Contribution to the 2030 Agenda

PRIMARY SDG

Goal 3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.

Goal 3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

Goal 3.B Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all.

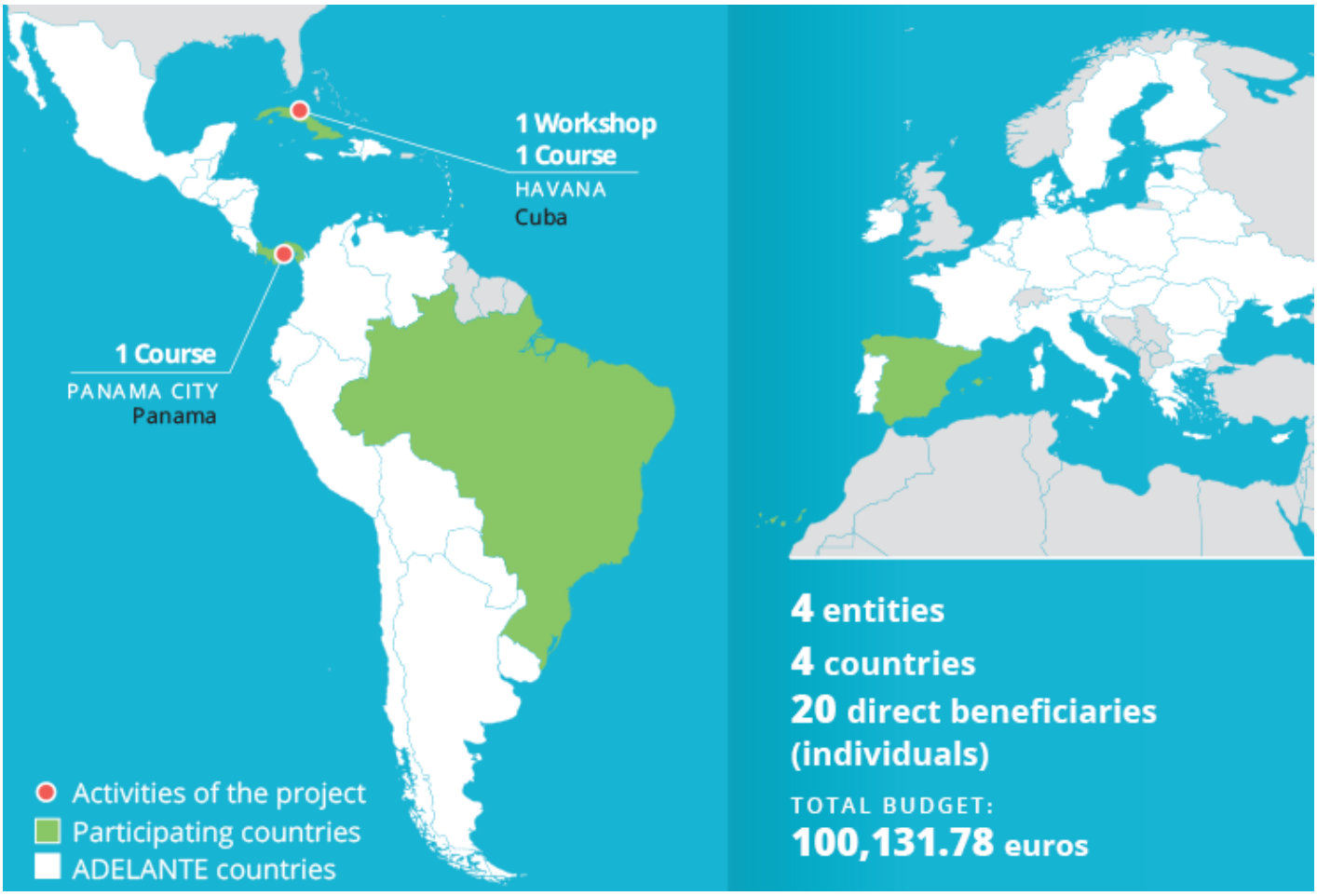
SECONDARY SDG

Goal 3.B Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all.

ADELANTE SDG

Goal 17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries

Territorial approach



Intervention methodology

Participants involved in the development of this project will take part in workshops and exchanges, in which previous experiences in the development of pharmaceutical formulations for veterinary use and the use of ozone in veterinary medicine will be presented. In addition, work will be done to characterise the compounds present in the formulation and conduct in vitro and in vivo trials to demonstrate their effectiveness.

Direct beneficiaries (individuals)

According to Rule 9 of the Guidelines for Applicants: all persons participating in the activities of the Initiative.

The project will primarily benefit the veterinary medical staff of the University of Panama and UFLA, Brazil.

Three Cuban experts with extensive experience in working with ozonated oils will also visit the institution, and will be involved in incorporating new laboratory techniques.

The CNIC will also provide training for young trainees in oil characterisation technologies and in the work on the use of ozone therapy and ozonated oils in laboratory animal models and pet species.

In addition, the University of Panama will provide six litres of ozonated oils and the UFLA will provide a sufficient quantity of ozonated oil, to be used in the different research projects.

Budget

EU contribution: 69,815.00 €
Co-financing - Triangular Cooperation Partnership: 30,316.78 €
Total budget: 100,131.78 €