



H.F.R.I.
Hellenic Foundation for
Research & Innovation

Description of the funded research project
1st Call for H.F.R.I. Research Projects to Support Faculty
Members & Researchers and Procure High-Value
Research Equipment

Title of the research project: A comprehensive approach against ovine progressive pneumonia for the preservation and sustainability of Chios sheep farms. Application of early disease-detection systems and generation of virus-free breeding stocks.

Principal Investigator: Athanasios Gelasakis

Reader-friendly title: Retrofree

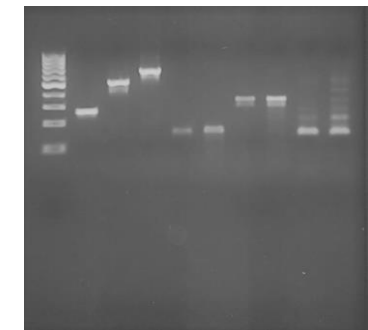
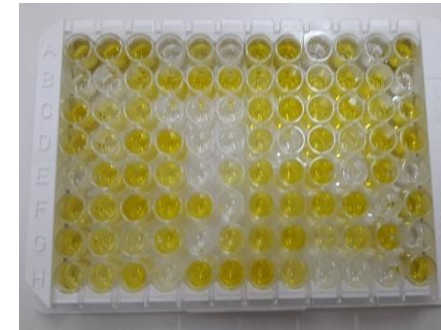
Scientific Area: Agricultural Sciences – Food Science and Technology

Institution and Country: Agricultural University of Athens, Greece

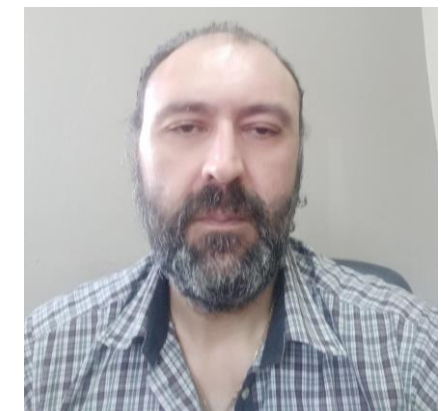
Host Institution: Agricultural University of Athens

Budget: 170,000.00€

Duration: 36 months



Athanasios Gelasakis
Assistant Professor



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Professor



Christos Balaskas
Assistant Professor



Aphrodite Kalogianni
PhD candidate

Research Project Synopsis

Ovine progressive pneumonia (OPP) is a viral, chronic, disease of sheep with long incubation period that leads to life-long infection and in some cases to the death of infected animals. It is a major health and welfare problem for animals, with huge direct and indirect economic losses for sheep farmers. In recent years, the prevalence of the disease is constantly increasing. However, the scarcity of epidemiological data regarding its transmission and dispersion between and within the farms does not allow to design and implement a national control and eradication program, although it is strongly evident that we have been led to a wide and uncontrolled spreading of the disease in our country and the rest of Europe. The aim of the proposal is to create an integrated program for the control of OPP in Chios sheep through: i) the use, development, implementation and evaluation of existing and innovative diagnostic techniques and procedures for the early detection of OPP virus, ii) management of the disease at farm level and (iii) the development of OPP-free breeding stocks. For the proposal, representative Chios sheep farms, already producing breeding stocks, will be used. In these farms, serological testing (ELISA) and molecular screening (PCR) for the early and efficient diagnosis of the disease will be performed after virus proliferation which will be achieved by the co-cultivation of peripheral blood monocytes/macrophages with sheep choroid cells. Simultaneously, production characteristics and individual animal health and welfare traits will be recorded, whereas, the epidemiology of the disease, the significance of horizontal and vertical transmission and the potential risk factors for its occurrence and dispersion will be investigated. Finally, evidence-based husbandry and preventive veterinary measures will be assessed for the strategic control of the disease and the a posteriori proposal of a sustainable protocol for the development of OPP-free flocks.

Project originality

As there is no treatment against OPP and all efforts for the development of protective vaccines has not produced any satisfactory results yet, the control of the disease in some European countries and in US, have been achieved, through control programs which aimed at early diagnosis of the infected animals. However, the effectiveness of these programs depends on the extent of their application, the regional prevalence of the disease and the applied diagnostic methods. The problem of early diagnosis of virus infection has been the major drawback given the weakness of the serological tests to detect all the infected animals and the level of sensitivity and specificity of molecular tests in different small ruminants lentivirus strains. Also, the degree of horizontal and vertical transmission may vary among the viral strains of a region or a farm. Relevant studies to investigate the specific characteristics of virus strains in our country and the importance of the horizontal and vertical transmission of the disease are scarce. Therefore, Retrofree will focus on the development, for the first time in Greece of a protocol for the management of OPP, emphasizing on the eradication of the disease from Chios sheep flocks and the creation of OPP-free flocks. In this protocol, the most appropriate laboratory tests will be sought, developed, implemented and evaluated to increase both specificity and sensitivity in early diagnosis of the disease. At the same time, the experimental application and evaluation of specific disease control measures, considering the epidemiological characteristics, the transmission patterns and the peculiarities of the farm management schemes as risk factors, will permit the development of targeted and typical procedures for the control of OPP and the preservation of the available genetic resources of Chios sheep in our country.

Expected results & Research Project Impact

The produced knowledge will form the stepping stone for the development of alternative disease control strategies under similar farming systems of our country. Retrofree will cover the research gap of the scientific community regarding the prevalence, the transmission, the predisposing factors, and the progression of the disease in purebred dairy sheep of Chios breed. At the same time, the evaluation of the available diagnostic techniques for their efficacy in early and safe diagnosis and the development of new ones, on an evidence-based concept, can ensure an integrated approach for the control of the disease in practice. Also, the potential resistance of Chios breed and the creation of certified OPP-free breeding stocks of will be investigated. In this way, Chios breed will be promoted and the import of foreign breeds, which undermine the production of “protected designation of origin” (PDO) dairy products, will decrease. The economic impact of controlling OPP in sheep farms in Greece is likely enormous, as the illness is associated with dramatic, direct and indirect economic losses. Moreover, animal health and welfare status will be significantly improved satisfying at the same time, the moral requirement of the modern consumer for safe products of animal origin, produced by healthy animals that live under appropriate conditions. Improving the economic viability of farms will ensure the development of the sector, the survival of farmers in the disadvantaged and remote provinces, and will increase the eligibility of the sheep farmer profession. Retrofree will provide useful conclusions and knowledge in the scientific community not only for the study of OPP but also for other diseases caused by retroviruses. At the same time, it will highlight the possibility of linking basic with applied research, in order the viable control one of the most important infectious disease in Greek sheep flocks.

The importance of this funding

Early and effective diagnosis of the OPP and the control of the disease are both critical endeavors for countries with dairy sheep farming sector. The development of novel and effective diagnostic tools, the epidemiological study of the disease in Greece and the investigation of its effects on the productivity and sustainability of sheep farms, require significant financial resources for the scientific personnel involved, as well as, for the purchase of consumables and relevant laboratory equipment.



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COMMUNICATION

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