

RESEARCH AND DEVELOPMENT



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ERASMUS +

Developing a mentoring programme for student-athletes

Program Cooperation

Controlling metal fatigue in rails in Athens Metro

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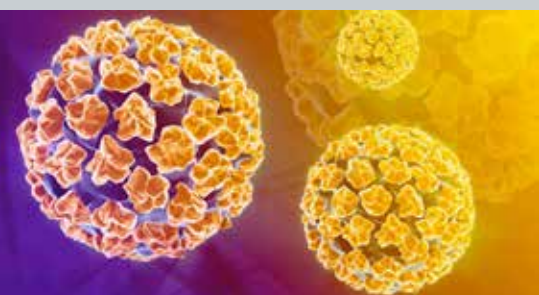
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Developing a mentoring programme for student-athletes

The University of Thessaly is one of five EU universities implementing a teaching model to provide dual career training to young sportspeople-students

Facilitating athletes in developing dual careers is one of the main EU policies in the field of sport. Student-athletes need to be able to combine their studies with their sport training and competitions.

With support of the European Commission funds, specifically the Erasmus+: Sport, Youth and EU Aid Volunteers programme, a consortium of five European universities is developing ESTPORT, an innovative European sport tutorship model for the dual career of athletes.

The project, which was approved in a 2014 call, responds to one of the three EU general objectives to promote and support the good governance in sport and dual career of athletes.

Other partners are Leeds Trinity University (UK), Catholic University of Murcia (Spain), University of Malta and Foro Italico University of Rome (Italy).

The project's scientific coordinator at the University of Thessaly is Athanasios Koustelios, professor of sport and recreation management in the Department of Physical Education and Sport Science.

The main EU policies in the field of sport all set the following priorities regarding the issue of dual careers for athletes:

- To provide dual career training for young sportspeople and to provide high quality local training centres to safeguard their moral, educational and professional interests (White Paper on Sport, 2007)
- To ensure that young high-level athletes are offered quality education in parallel to their sport training as well as to develop European guidelines on combined sports training and general education (Communication on Sport, 2011)
- To prepare a proposal for European guidelines on “dual careers” aimed at ensuring that young athletes receive quality education alongside their sport training (EU Work Plan for Sport, 2011–14).

Therefore, the specific objective of the ESTPORT project is to develop, transfer and implement an innovative EU sport tutorship programme in different European universities, involving public authorities, sport-related organisations and educational actors, as key stakeholders in achieving the EU Guidelines on Dual Careers for Athletes.

The ESTPORT project has developed collaborative synergy in the field of sport for students and professional athletes and has established a network of the universities involved and other parties related to sports development. The envisaged European sport mentoring program will allow high-level student-athletes further develop their dual career. The ultimate goal is therefore to facilitate, through the sport tutorship, the integration of athletes into the university context, by supporting them so that they are able to combine their studies with their sport training and competitions.



Controlling metal fatigue in rails in Athens Metro

DECORAIL project significantly increases safety of Athens Metro



The DECORAIL project, which was completed at the end of 2015, deals with the development of a methodology for the total control of metal fatigue in rails in the Athens Metro system.

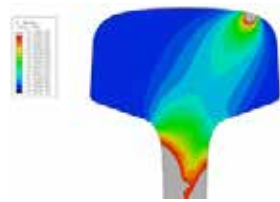
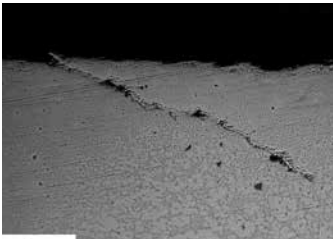
The rolling of the wheels of a car on the rails causes two problems. The first involves the wearing of rails. It causes material removal and, over time, changes the rail profile, thus making the rail useless. The second problem, which is more significant, is the formation of small parallel cracks on the surface of the rail. These

cracks form due to metal fatigue arising from contact stress, which develops between the wheel and the rail. The phenomenon has been termed rolling contact fatigue (RCF). Initially, the cracks propagate at a shallow angle to the rolling surface. However, when they grow to a critical size, they turn to the interior of the rail, towards the rail web, where they can cause the rail to fracture. This is what happened in the rail crash at Hatfield, just outside London, on 17 October 2000, which resulted in four fatalities and 70 injuries. The subsequent investigation



The investigation

of the problem was assigned to the Laboratory of Materials, University of Thessaly.



indicated that the cause of failure was RCF, and that about 300 critical cracks had formed in the rail that fractured.

In the Athens Metro, the first RCF cracks appeared just before the Athens Olympics of 2004. The investigation of the problem was assigned to the Laboratory of Mate-



rials, University of Thessaly. As a result of the investigation, lower speed limits were imposed in critical locations, while a non-destructive ultrasonic testing methodology of the tracks in non-operating hours was established. Rails with detectable cracks were then replaced regularly. With the expansion of the Metro system in Athens, the operating company Urban Rail Transport (STASY) in cooperation with the Laboratory of Materials and Demokritos (the National Centre for Scientific Research), submitted a research proposal to Greece's General Secretariat for Research and Technology for the total control of RCF in the rails of Athens Metro. The project was funded through the Cooperation 2011 programme. An extensive metallurgical study of the initiation and propagation of RCF cracks was performed, including the effects of various operational conditions. In addition to the metallurgical analysis, a detailed computational study was performed on the conditions of crack propagation, while a complete characterisation of the rail mechanical properties was carried out. New non-destructive techniques for the detection of cracks were tested. Based on the results of the DECORAIL project, Athens Metro has developed procedures for the control of RCF in rails, including a periodic grinding of rails for the removal of cracks before they reach critical size. In this way the safety level of Athens Metro has increased significantly.

Contributors to the DECORAIL project from the University of Thessaly were the following:

- Laboratory of Materials, Department of Mechanical Engineering: Prof. GN Haidemenopoulos (principal researcher), Dr PI Sarafoglou, Dr AD Zervaki
- Laboratory of Mechanics and Strength of Materials, Department of Mechanical Engineering: Asst Prof A. Kermanidis, P. Christodoulou
- Laboratory of Strength of Materials and Micromechanics, Department of Civil Engineering: Prof A. Giannakopoulos, K. Baxevanakis

1. GN Haidemenopoulos, AD Zervaki, P. Terezakis, J. Tzanis, AE Giannakopoulos, MK Kotouzas, "Investigation of rolling contact fatigue cracks in a grade 900A rail steel of a metro track," *Fatigue & Fracture of Engineering Materials & Structures* 29/11 (2006): 887–900.
2. GN Haidemenopoulos, PI Sarafoglou, P. Christopoulos, AD Zervaki, "Rolling contact fatigue cracking in rails subjected to in-service loading," *Fatigue & Fracture of Engineering Materials & Structures* 2016 (forthcoming).



Within the European Commission's Research and Innovation Framework Programme Horizon 2020, available for research and innovation from 2014 to 2020



RESEARCHERS' NIGHT: 2014-2015

Within the European Commission's Research and Innovation Framework Programme Horizon 2020, available for research and innovation from 2014 to 2020, the University of Thessaly and its Professor, Kouretas Dimitris, Responsible for the project, participated in the "Researchers' Night: 2014-2015" Activity: H2020-MSCA-NIGHT-2014. The University of Thessaly, as the key partner of the collaboration (Centre for Research and Technology, University of Athens, Science and Technology Park of Crete, University of Patras) hosted the event, which for the year 2015 was held in the city of Trikala, aiming to approach common people and future scientists, and raise awareness about the researcher's work so as to give prominence to both the work and its role in life, science, development and growth, and the immediate effect of scientific achievements in the local community. High school, university, college students and learners had the opportunity to be informed about the benefits of a career in research. Scientists, researchers, university and high school students also participated in the event, with the full support of national and local institutions and organisations, such as the Centre for Research and Technology Hellas, the Municipality of Trikala et al.

All the events took place simultaneously - on 25 September 2015, in every city across Europe hosting the event.

The days that preceded the main event, namely from Monday 21 September 2015, concurrent events were held, aiming to inform the public about the main event of the 25th of September.

The concurrent events included:

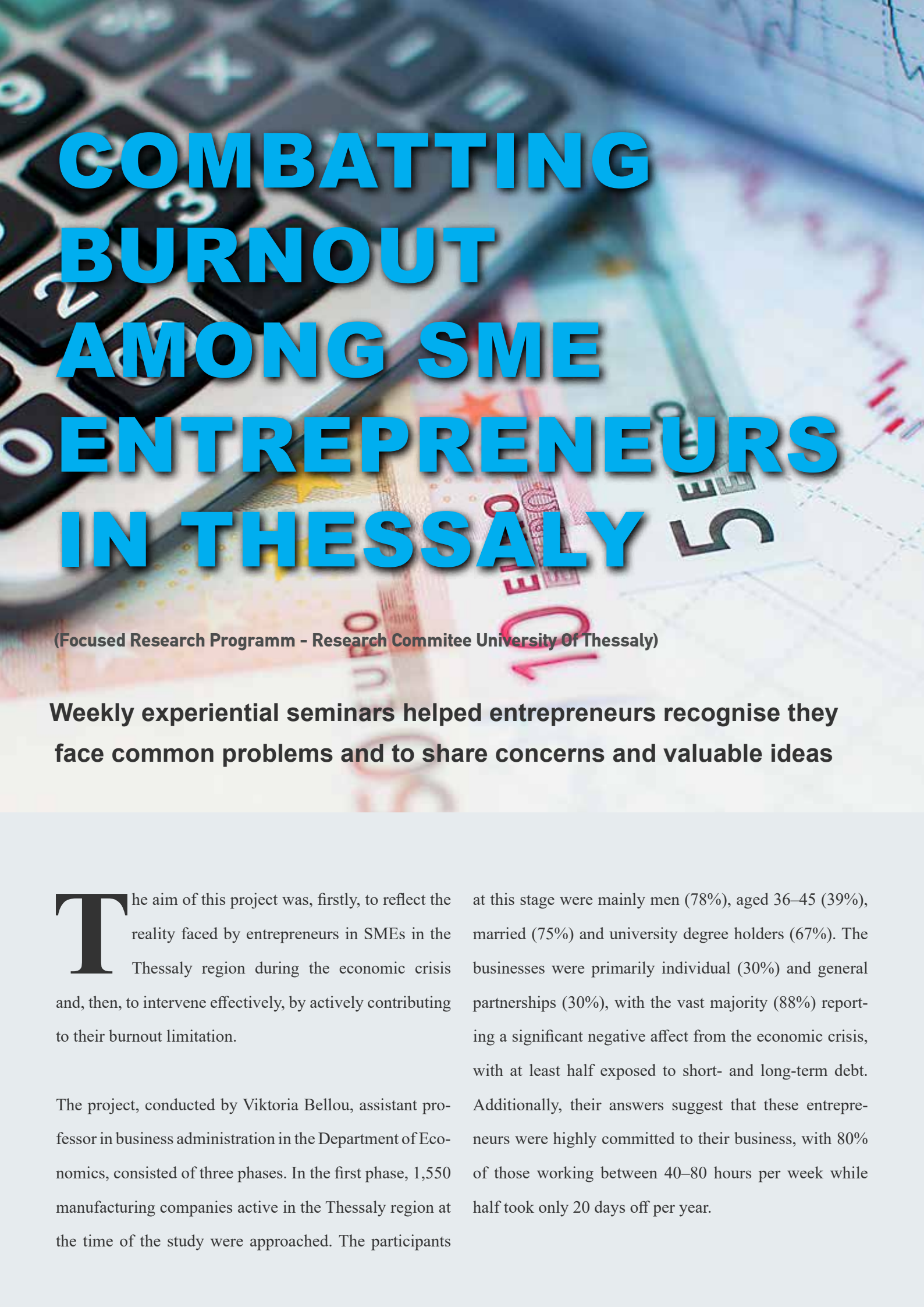
- The Street Value of Science - lecture/concert
- Sports events with the participation of citizens and students
- music events
- open round tables with the participation of researchers, with discussions on matters concerning the researcher's work and the society (Eg. Research on industry, research on solving issues of urban residents, such as dealing with air pollution)
- researchers' visits to schools,
- speeches for the students,
- television shows – discussions on relevant topics
- radio shows and infomercials

On the evening of the event, the following activities took place:

- ❖ Lectures by researchers, institutions and organisations from the region of Trikala,
- ❖ Videos with the colleagues' innovations,
- ❖ booths presenting products of scientific research that also have commercial use,
- ❖ Booths with scientific material, experiments or research findings from the region of Thessaly

The event was concluded with an award ceremony for the participants and a music event.





COMBATTING BURNOUT AMONG SME ENTREPRENEURS IN THESSALY

(Focused Research Programm - Research Committee University Of Thessaly)

Weekly experiential seminars helped entrepreneurs recognise they face common problems and to share concerns and valuable ideas

The aim of this project was, firstly, to reflect the reality faced by entrepreneurs in SMEs in the Thessaly region during the economic crisis and, then, to intervene effectively, by actively contributing to their burnout limitation.

The project, conducted by Viktoria Bellou, assistant professor in business administration in the Department of Economics, consisted of three phases. In the first phase, 1,550 manufacturing companies active in the Thessaly region at the time of the study were approached. The participants

at this stage were mainly men (78%), aged 36–45 (39%), married (75%) and university degree holders (67%). The businesses were primarily individual (30%) and general partnerships (30%), with the vast majority (88%) reporting a significant negative affect from the economic crisis, with at least half exposed to short- and long-term debt. Additionally, their answers suggest that these entrepreneurs were highly committed to their business, with 80% of those working between 40–80 hours per week while half took only 20 days off per year.

As expected, exhaustion and emotional fatigue were quite common among participants. Entrepreneurs reported feeling very tired often and not having enough energy to socially interact with their friends. The burnout they faced seems to have emerged from both the increased demands at work that the economic crisis brought about and their encounters with customers, suppliers, banks and, mainly, government entities. Regarding their strategies for managing work-related stress, it is remarkable that most invested even more hours in their business. Yet, this practically created a vicious circle, as extended working hours inflate burnout symptoms.

The second phase of the study included qualitative analysis. Interviews were conducted with 60 SME entrepreneurs so as to gain an in-depth understanding of entrepreneurial burnout. Apparently, those who a) had not studied, b) were in the first or last stages of their professional path and c) men, for different reasons in each case, were the most vulnerable to professional burnout. Regarding the manifestations of burnout, these include various psychosomatic problems and the turn to smoking, alcohol and changes in eating habits. In contrast, few interviewees sought either to share their difficulties with relatives or experts to enhance their skills or to collaborate with other entrepreneurs.

The interviewees identified a series of exogenous solutions that could facilitate the operation of their businesses and could thus improve their working conditions. For example, the majority acknowledged the need to reduce insurance costs, improve access to loans, take initiatives to stabilise the Greek economy and improve consumer psychology. They also recognised the necessity for active support from commercial chambers and that schools would incorporate

business basics in the education system. Interestingly, they also expressed ideas that focused on initiatives that SMEs should take themselves. These include being more open, keeping up to date with new technologies, focusing on innovation and the creation or participation in collaborative networks and clusters.

The third phase of the project included four weekly experiential seminars for SMEs entrepreneurs, conducted by a psychologist. Following the publication of an advertisement/call for participation, two groups were established, one for the city of Volos and one for the city of Larissa. Participation in these seminars was free of charge and was open to entrepreneurs, regardless of their educational level and business profile. The aim of this intervention was to give participants ways to restrict and even prevent burnout. The evaluation of the intervention showed that participation helped entrepreneurs realise that they face common problems with colleagues, share concerns and especially valuable ideas and experience, while it also created opportunities for cooperation.

In conclusion, a workshop was conducted by Prof Dimitris Bourantas, of the Department of Management Science and Technology of the Athens University of Economics and Business. The workshop theme, Strengthening SME entrepreneurs, sought to highlight leadership as a means to effectively manage concurrent challenges that SME entrepreneurs are faced with.

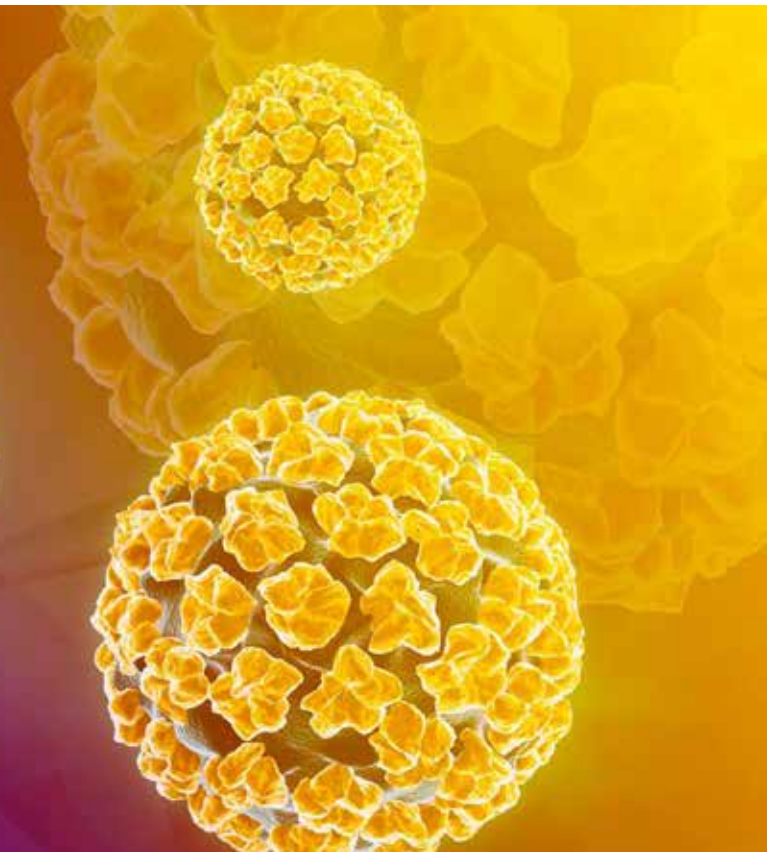
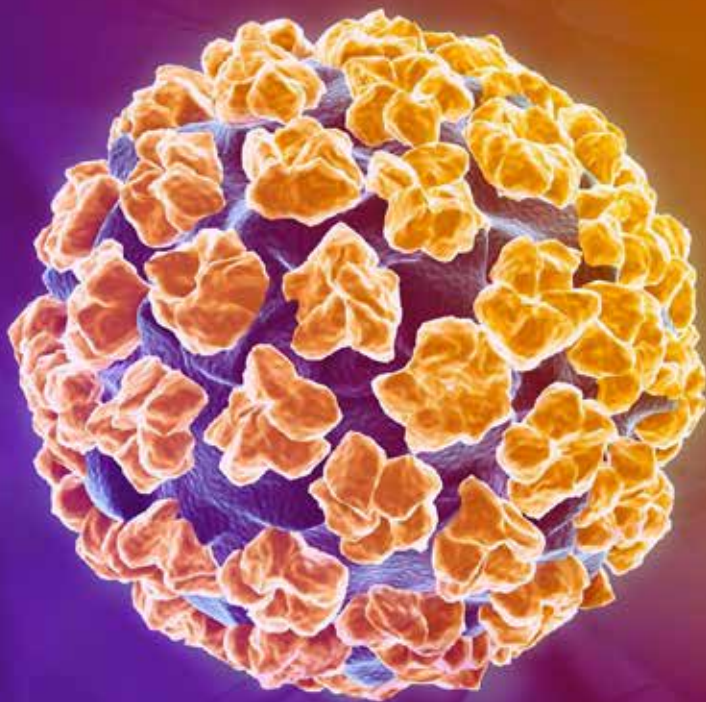
TESTING FOR HUMAN PAPILLOMAVIRUS IN THESSALY

(Focused Research Programm - Research Commitee University Of Thessaly)

HPV has been linked to tumours of the upper respiratory tract

Although human papillomavirus (HPV) is associated with cancer of the cervix, in recent years the virus, specifically some certain types of it, have been linked with tumours of the upper respiratory tract.

Conducted by the Microbiology lab of the Department of Medicine and the Molecular Biology and Genomics lab of the Department of Biochemistry and Biotechnology, the aim of this study was to determine the prevalence of HPV in the upper respiratory tract in asymptomatic men and women in the Central Greece region.



All project participants were provided with a questionnaire (which requested information about their age, profession, education, family status, etc) and they were informed about the purpose of the project. A total of 160 pharyngeal swabs were taken from 73 men and 54 women between September 2010 and June 2011 for HPV testing, as were endocervical samples from female participants.

The detection of HPV and the analysis of types was performed by a commercial molecular method. According to the results, the prevalence of HPV in the upper respiratory tract was 13%, while the most prevalent HPV type was the type 31 (28.5%), followed by the types 45, 56 and 51 (19%) and 34, 48, 49, 33 and 16 (4.7%).

The results of the study were presented in various conferences in Greece, Denmark and Austria. Furthermore, a public lecture was given on the findings in Larissa University Hospital.

- Z. Florou, C. Messini, V. Lachanas, A. Vasdeki, G. Sveronis, I. Messinis, E. Petinaki, *High prevalence of sexually transmitted agents in asymptomatic Greek women*, 25th European Congress of Clinical Microbiology and Infectious Diseases, 25-28 April 2015, Copenhagen, Denmark.
- M. Tsea, Chr. Korais, Z. Floros, K. Mavropoulou, E. Petinaki, Ch. Skoulakis, *Comparative study of HPV incidence in patients with head and neck cancer and healthy controls in Thessaly*, 22th Postgraduate Conference Hellenic Society of Otorhinolaryngology Head and Neck Surgery, 17-19 October 2014, Thessaloniki
- M. Tsea, Z. Floros, C. Mousaolidis, S. Exarchos, E. Petinaki, Ch. Skoulakis *Comparison of the HPV subtypes in clinical samples oropharynx and cervical smears in women in Thessaly*, 17th National Conference Otorhinolaryngologias, 10-13 October 2013, Alexandroupolis.
- Z. Floros, D. Klapsa, Ch. Messina, A. Liakopoulos, A. Papaioannou, I. Messinis, E. Petinaki, *Frequency of Human Papilloma Virus (HPV) in cervical young women smear in Thessaly*, 7th National Congress of Clinical medicine Biopathology, 15-17 March 2012, Athens Concert Hall Convention Centre.
- Z. Floros, A. Mixti, K. Chaidas, A. Liakopoulos, K. Pantelidis, P. Koltsidopoulos, Ch. Skoulakis, E. Petinaki, *the presence of human papillomavirus (HPV) in the healthy population throat in Thessaly*, 7th National Conference of Clinical Medicine Biopathology, 15-17 March 2012, Athens Concert Hall Convention Center
- D. Ioannidis, Z. Floros, T. Tetzis, E. Petinaki, Ch. Skoulakis, *Detection of HSV1-5 and HPV by real time pcr and the potential association with polyps development*, 5th World Congress Endoscopic Surgery of the Brain, Skull Base and Spine combined with the 1st Global Update on FESS, the Sinuses and the Nose, 29th March-1st April 2012, Austria.
- Z. Floros, A. Mixti, K. Chaidas, P. Koltsidopoulos, E. Petinaki, Ch. Skoulakis, *the presence of human papillomavirus (HPV) in the healthy population throat in Thessaly*, 16o Hellenic Congress of Otorhinolaryngology Head and Neck Surgery, 1-4 December 2011, Athens



TOXICOLOGY





Applications are now being accepted for Greece's first postgraduate programme in toxicology, which will be offered by the Department of Biochemistry and Biotechnology from the 2016–17 academic year.

The objective of the MSc postgraduate programme is to train high-quality scientists in applied toxicology, with particular emphasis on respect for the environment and the protection of the health of workers and consumers. Graduates will develop the broad range of skills, knowledge and experience required for successful careers in all sectors of the chemical industry, laboratories engaged in the analysis and biological activity of toxic substances, the food industry, and the analysis of genetic material for forensic purposes. They will emerge with comprehensive knowledge of the European educational framework in the field, which will prove valuable in the development of the industrial sector as well as in specialized laboratories and services.

In addition, this master's programme provides some of the minimum educational requirements for the European Register of Toxicologists. Therefore, graduates could apply in due course for the title of European Registered Toxicologist (ERT), depending on the rules and regulations of Eurotox and the Hellenic Society of Toxicology (EET).

The ERT title qualifies holders to work as experts within the EU at different levels (courts, public and private organisations). This is of importance to Greece, where over 4,000 legal proceedings take place every year concerning the environment, forensics and infringements in the area of food, etc. With a few exceptions, the country has no official ERT experts. Classes, which begin in October 2016, will take place on Saturdays and Sundays to facilitate students who work during the week. The course lasts three semesters (two semesters of classes followed by a third for the preparation of a thesis/ dissertation). A number of scholarships will be awarded to students on the basis of merit.

BOX

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