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The European Training Network SELECTA reaches its end

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The final meeting of the European Training Network SELECTA (Smart ELECTrodeposited Alloys for environmentally sustainable applications: from advanced protective coatings to micro/nano-robotic platforms), Project no. 642642 funded under Horizon 2020, was held last August in Castelldefels (Barcelona, Spain) [1,2]. SELECTA has been training 15 early stage-researchers (ESRs) in areas like the fabrication and in-depth characterization of innovative protective coatings, micro/nano-electromechanical systems (MEMS/NEMS), and wirelessly actuated micro/nanoswimmers. Electrodeposition but also sputtering has been utilized by the ESRs during the last three years to achieve their goals. New aqueous-based electrolyte formulations which do not make use of hazardous compounds have been devised, whenever possible, to produce dense and porous coatings, composite layers, patterned submicron structures, micro- and nanowires, etc., free from scarce raw elements like noble metals or rare earths. Among the newly electrodeposited materials, Fe-based systems have been mostly targeted: Mn, Sn, Fe–Mn, Fe–Cu, Fe–W, Fe–P, Fe–Sn, Fe–Pd, Fe–W–P, Fe–W@Al₂O₃, Fe–Sn, and Fe–Cr–Ni. Likewise, binary and ternary layers comprising Fe–Al, Fe–Ti–N and Fe–Mn–Al have been pursued by sputtering. These works have been theoretically complemented with approaches such as finite-element modelling or density functional theory calculations, mostly carried out at the Faculty of Engineering of University of Kragujevac (Serbia) and University of Ioannina (Greece). The resulting materials are appealing for diverse technological applications, such as corrosion protection, oil-water separation (water remediation), biomedical implants, spintronic devices, or MEMS/NEMS with outstanding mechanical and magnetic performance. Three companies have participated in the SELECTA project, namely Hirtenberger Engineered Surfaces GmbH (formerly Happy Plating GmbH) from Austria, Eleoss GmbH from Switzerland, and Aluinvent Zrt. from Hungary.

The final meeting of SELECTA held in Castelldefels on 26-29 August 2018 was organized by the coordinating institution, Universitat Autònoma de Barcelona, and gathered the principal investigators (PIs) of the beneficiary partners, the ESRs, and the representatives of some partner organizations like Fundación CIDETEC based in San Sebastián (Spain) (Figure 1). Following the same philosophy as in the preceding workshops, the meeting included both inspiring scientific talks and soft skills training sessions. The ESRs gave 20-min presentations to show the results derived from the last stretch of their PhD journey the 1st day. A guided visit to the synchrotron ALBA took place the 2nd day (Figure 1), whereas scientific talks were delivered on the 3rd day by ICREA Research Prof. Neus Sabaté from Centre Nacional de Microelectrònica (CNM-CSIC) and Dr. José Manuel García-Torres from Universitat Politècnica de Catalunya (UPC). These talks were followed by a seminar entitled “Are you ready for the next step: MSCA Individual Fellowships!?” given by Dr. Natalia Tintaru from Vilnius University. In the afternoon, a soft skills training session on grant writing was offered by Dr. Gavin Lucas from ThePaperMill.

So far, the ESRs have published around 25 papers in peer-review journals covering the areas of electrodeposition, surface technology, corrosion science, nanotechnology and materials science in general. Many more publications will come in the following months on the most recent results achieved during the project duration. The fellows also attended a large number of national and international workshops/conferences (more than 60) in order to disseminate the work carried out in the frame of SELECTA. The great skills of the ESRs have been recognized in a number of prizes and awards like in the "Art in Magnetism" contest (INTERMAG 2018, Singapore, April 2018) won by Matteo Cialone (ESR from Istituto Nazionale di Ricerca Metrologica, Italy) [3], or the "Best Student Presentation" awarded to Aliona Nicolenco (ESR from Vilnius University, Lithuania) during the 3rd COST Action e-MINDS (MP1407) Training School held in Siófok, Hungary, on March 2018 [4]. Two of the ESRs also attended the 'Meet the Fellows' event held Madrid in April 2016 and were elected as "MSCA fellows of the week". MSCA acronym stands for Marie Skłodowska-Curie Actions.

The ESRs performed secondments in different partners within the consortium (and exceptionally out of it) for an average length larger than 3 months to carry out dedicated experiments which were not possible or straightforward at the host institution. These joint ventures have resulted in bilateral [5,6] and even trilateral publications [7].

Among many other aspects, gender equality was promoted from the very beginning of the project, not only at the level of consortium and recruited fellows, but also the at the level of the trainers participating to each workshop. Overall, 45% women and 55% men were trainers in SELECTA workshops.

SELECTA project will officially close next December 2018 but their outcomes will surely expand beyond. In particular, the project has furnished a new generation of talented doctors in the field of surface engineering that will continue their careers either in academia or industry. Also, the fellows have established an invaluable network of contacts with their peers, the PIs, and the speakers invited to the different events organized by SELECTA. This wide-ranging network of contacts will for sure mature and bear fruits in the near future.



Figure 1. *Top*: Attendees to the final meeting of SELECTA held in Castelldefels (Barcelona). *Bottom*: Visit to synchrotron ALBA based in Cerdanyola del Vallès (Barcelona) held last 28 August 2018 during the final meeting of SELECTA.

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