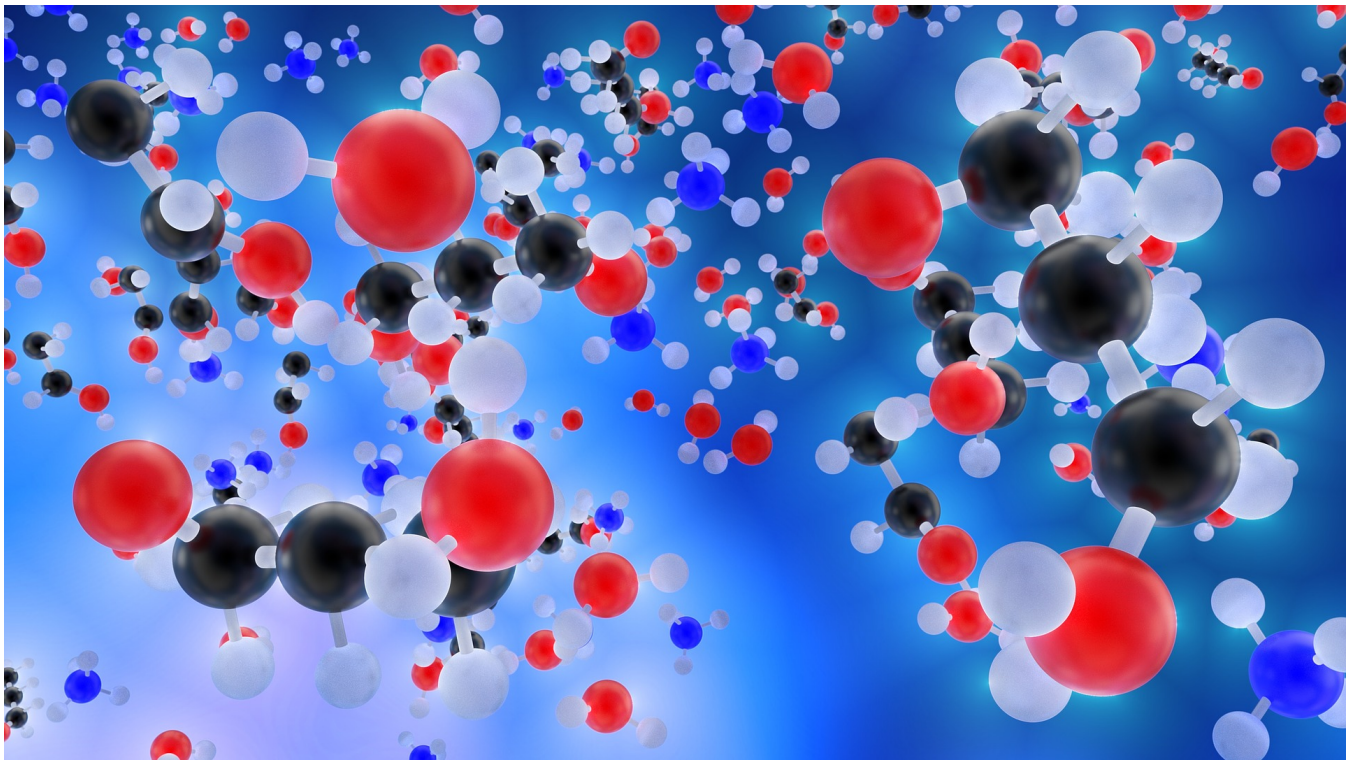
eMIP. New method for manufacturing biochips based on MIPs at nan

Design and synthesis of MIPs as patterned thin films with micro and nanoscale motifs by conventional techniques of micro and nanofabrication



Contact information

Address: ISOM, ETSI de Telecomunicacón – UPM, Avenida Complutense, 30, Ciudad Universitaria, 28040, Madrid
Phone number: 910672573
Website: isom.upm.es
Email: carlos.angulo.barrios@upm.es

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Technological solutions

Research and innovation areas

- Bioeconomy, Biotechnology and Food Systems
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Brief description of the technology solution and the added value it provides

The Universidad Politécnica de Madrid and Universidad Complutense de Madrid have developed eMIP, a non-contact technique that allows the fabrication of nanoscale molecular imprinting polymers or MIPs. This method enables the design of arrays of MIPs for the simultaneous detection of multiple (bio) chemical substances. Their nanometer size provides greater sensitivity so that smaller volumes of samples (analytes) and operating power are required. Moreover, as a non-contact technique, it avoids contaminating the MIP material unlike other MIP structuring techniques such as printing molds. From the social point of view, the use of biochips and smart bio-tags manufactured by this method will circumvent stringent storage and operation requirements , making this innovation accessible to less developed and less purchasing power societies.

Description of the technological base

Non-contact technique for manufacturing MIPs nanostructures, through a direct write system, solving the technical problem of contamination of the polymeric material which results from the use of other techniques (“nanoimprinting”). Unlike other techniques which use UV radiation for polymerizing, the proposed solution is based on the irradiation of the surrounding material with e-beam radiation to generate the nano-patterns, which are non-irradiated (and thus not damaged), acting as MIP.

Their nanometer size allows its use in the analysis of reduced sample volumes. It is also possible the simultaneous detection of multiple analytes using “arrays” (MIP matrices). The technique allows nanostructured MIPs to be synthesized for specific applications considering both the dimensions of the material and the capacity to identify a specific chemical compound. This solves the lack of biological receptors selective to compounds of interest.