

Project:**Dynamic Adaptive Materials for Separation and Sensing Microsystems (DAMSSM)**

This research project overcomes a multidisciplinary research in order to develop new “smart” nanomaterials with applications to new environmentally friendly nanotechnologies. Basically, we propose a new “supracombinat” methodology including many multidisciplinary knots of synergetic concepts of supramolecular, dynamic combinatorial and material chemistry which can be implemented simultaneously in order to converge quickly to polyfunctional microsystems. More precisely, we explore the dynamic diversity of the input supramolecular and combinatorial systems for functionally driven optimisation through selection and fixation in solid output microsystems of specific functions like selective membrane separations or sensing.

This allows us to envisage applications for different and diverse purposes:

1. Biomimetic membranes,
2. Drug delivery and gene transfer systems,
3. Optical and electronic sensors for metabolites of interest.

Comments:

Research field: Design and synthesis of supramolecular devices, Material Chemistry
Self-organisation combined with recognition is exploited to acquire adaptive information transfer in materials (“transcribing materials”) with an original approach based on skill in organic synthesis and coordination chemistry. The approach taken by the applicant may be groundbreaking.

The candidate, originating from Romania moved after academic education in Bucharest, got his PhD in Montpellier and after a postdoctorship with Nobel Laureate Jean-Marie Lehn, he has recently become research scientist at CNRS Institut Européen des Membranes in Montpellier. He worked successfully in Romania and became Assistant Professor at the age of 25. Barboiu is a very talented, ambitious and well-organized young scientist and has without doubt great leadership qualities as well. He has despite considerable scientific, social and linguistic barriers, crossing national borders and cultures, managed extremely well in science, with a production of outstanding quality. He may clearly become world leading in the field.

The quality of the proposal is outstanding and intellectually nicely formulated. His approach, a dynamic combinatorial recognition one, to develop new supramolecular systems for “dynamic adaptive” separation and sensing microsystems, is ingenious and might put the Montpellier institute on the map of nanotechnology breakthroughs.

Nationality: Romanian

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New institution: CNRS 6 – UMR 5635 – Institut Européen des Membranes

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