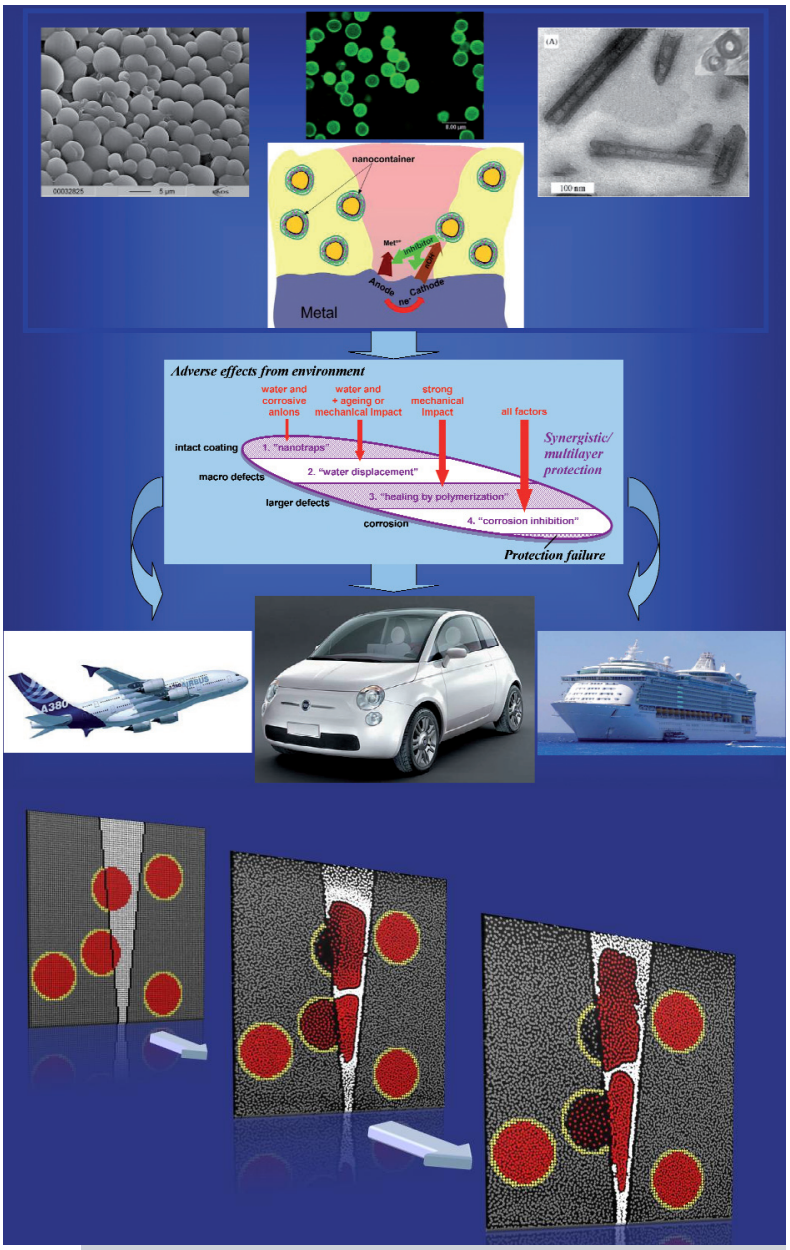
Steinbeis

# MULTI-LEVEL PROTECTION OF MATERIALS FOR VEHICLES BY "SMART" NANOCONTAINERS (MUST)

**The destructive effect of environment and the corrosion induced degradation are the important problems which determine the service life of a vehicle or its components. The application of organic coatings is the most common method of improving protection and durability of structures. However the degradation processes develops faster after disruption of the protective barrier. Therefore an active protection based on "self-healing" of defects in coatings is necessary to provide long-term effect.**

The main vision of the project MUST is development of new active multi-level protective systems for future vehicle materials. Products like self-healing coatings, adhesives and other composite materials will be based on "smart" release nanocontainers incorporated into the polymer matrix of current commercial products. The nanocontainer is a nanosized volume filled with an active substance which prevents direct contact of the active agent with the adjacent environment. A multi-level self-healing approach will combine several damage prevention and reparation mechanisms, which will be activated depending on type and intensity of the environmental impact. In MUST, the coatings and the adhesives will be designed to "measure" their internal state, reacting on degradation mechanisms like swelling, micro-cracking, and formation of pores in order to provide effective self-healing properties as response to specific external impacts or shocks.

The main objective of the project is the design, development, upscaling and application of novel multi-level protection systems like coatings and adhesives for future vehicles and their components to improve radically the long-term performance of metallic and polymeric substrates and structures.

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