



BIST Ignite Project Progress

January 2020

1. Title of the project

Enzyme-powered, Metal Organic Framework based MOTORS

2. Acronym

MOFtor

3. Names and centres of the PIs

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4. Abstract

MOFtors proposes the construction for the first time of a series of enzyme-powered motors based on porous metal-organic frameworks (MOFs) for their use as controllable, stable, and highly porous drug-delivery and water remediation machines. For this purpose, we create homogeneous microporous MOF particles that incorporate mesoporosity by using a new type of solid-gas (clip-off) chemistry. Such rare coexistence of two distinct types of porosity in a multicompartamental particle is then used for creating the enzyme powered self-propelled MOFtors, by encapsulating different classes of enzymes in the MOF mesopores. This strategy allows the design of Enzyme-MOFtors that are still highly microporous; a property that can be later used for the controlled adsorption/release of small metal ions/molecules of interest, such as pollutants and drugs, and thus use these Enzyme-MOFtors as smart machines for environmental and biomedical applications.