

Application for a:	Outgoing Scheme NEWFELPRO Fellowship for senior researcher
Proposal Acronym:	MechPress
Proposal Title:	Clean and solvent-free synthesis of microporous materials by mechanochemical assembly and templating under controlled gas atmospheres
Research area(s):	Life sciences LIF
Research sub-disciplines:	Supramolecular chemistry Chemical reactions Solid state materials Porous materials Physical chemistry Chemical instrumentation Intelligent materials - self-assembled materials Coordination chemistry Structural properties of materials
Category of research:	basic
Duration in months:	16
Keywords:	mechanochemistry, high-pressure synthesis, green chemistry, porous materials, coordination polymers, covalent-organic frameworks, gas-templated reactions, in-situ monitoring
Abstract:	<p>Porous metal-organic frameworks (MOFs) have recently attracted a significant interest of material scientists, mostly due the prospect of high surface areas and their potential for storage, catalysis and sensing. The classical synthesis of these materials is usually long-term and requires high volumes of solvents and high temperatures for reaction.</p> <p>Within this project we propose to develop a new methodology for clean and low-energy synthesis of microporous MOFs, from metal oxides and suitable organic linker(s), by milling at controlled pressure of gases for which the target MOF is highly selective. We would like to test is there a possibility to template the organization of metal nodes and organic linkers by gas, which is still undeveloped field of chemical synthesis. We will focus our study on the synthesis of MOFs with a high-storage capacity for environmentally important carbon dioxide gas, but we believe that the methodology could prove general for other porous materials.</p>

Does this proposal possess
any of the sensitive ethical issues
detailed in ethical issues table?

No