Microbiology MASTER - M2 INTERNSHIP **2021-2022** (end of January – end of June)	
TITLE	High pressure/high temperature methanogenesis for CO_2 recycling.
COMPETENCES / INTERESTS	**The candidate needs to be a microbiologist. He/she has to demonstrate good technical capacities and team spirit to interact with the different people involved in the project.**
SUBJECT	The increasing concentration of CO_2 in the atmosphere is now threatening our ecosystem and our way of life. One solution envisioned to reduce this effect is to inject CO_2 into deep geological formations, including saline aquifers. In these extreme environments, methanogenic microorganisms are able to convert CO_2 into CH_4, through the hydrogenotrophic methanogenesis reaction: **$CO_2 + 4\ H_2 \rightarrow CH_4 + 2\ H_2O$**. Thus, this CO_2 can be recycled biochemically to a valuable compound. This transformation of the stored CO_2 into CH_4 would reduce the cost of capture and storage, changing the paradigm of the price per ton of buried CO_2. In this context, it is critical to access the kinetics of such a methanogenesis reaction by different microbial strains to better understand the metabolic reaction in the frame of large CO_2 injection. Therefore, the aim of this internship, realized in the frame of the ERC BIG MAC project, concerns the study of this biotransformation reaction by using lab scale high-pressure approaches. The main goals are: (i) determining the H_2/CO_2 partial pressure condition resulting in optimized CH_4 production rates (ii) determining the CH_4 production kinetics and (iii) testing the strain resistance to pure CO_2 or H_2 injection.
TECHNIQUES USED	HP/HT Microbiology, high-pressure transparent reactors, gas chromatography, anaerobic cultures, *in situ* characterization
HOST LABORATORY	ICMCB (Institute of Condensed Matter Chemistry of Bordeaux)
TEAM	Supercritical Fluids group
SCIENTIFIC DIRECTORS	Name : Emeline Vidal, Anaïs Cario and Samuel Marre Tel : 05.40.00.63.38 Mail : emeline.vidal@icmcb.cnrs.fr 05.40.00.63.37 anais.cario@icmcb.cnrs.fr 05.40.00.62.94 samuel.marre@icmcb.cnrs.fr Address : ICMCB-CNRS 87 avenue du docteur Albert Schweitzer, 33607, Pessac Cedex, France
Possibility to pursue the internship until the end of August: YES ☐ / NO X **Possibility to offer the internship to a M1 if not attributed to a M2: YES ☐ / NO X**	