Thèse CIFRE ISTCT UMR 6030 CNRS / Air Liquide Santé International

Joined PhD between entre ISTCT UMR 6030 CNRS Université de Caen-Normandie CEA, CERVOxy team and Air Liquide Santé International Medical R&D (Jouy en Josas)

Location : ISTCT – Caen (75%), Air Liquide – Centre d'innovation Paris in Jouy en Josas (25 %)

Subject.

The medical R&D of AIR LIQUIDE Santé INTERNATIONAL, in charge of developing new therapeutic gases and services for healthcare within Air Liquide Group, and the CERVOxy team of ISTCT, specialized in research on neuroprotection and in crystallographic studies, are recruiting a PhD student, to work on a collaborative project.

The objective of this project consists in identifying physiological protein targets for argon that could be applicable for new therapeutic indications in clinical use, and to better understand its mechanism of action. Argon is indeed an attractive gas with promising properties demonstrated in preclinical studies but a better understanding of the molecular mechanisms involved is important to support further developments.

In the context of collaborative research on noble gases with an Australian CSIRO team, a database has been previously built using molecular modeling. This database listing all predicted noble gas binding sites in the proteins from the PDB will be thoroughly analyzed in order to identify interesting families of proteins which have specific argon binding sites. This analysis will provide a list of proteins with predicted physiologically relevant argon-specific binding sites. These targets arising out of an *in silico* analysis will have necessarily to be validated. The existence and the specificity of the predicted argon binding sites will be checked using crystallography under gas pressure. The modulation of physiological activity in the selected targets will be analyzed with *in vitro* assays in presence of argon. This unique combination of *in silico* analysis, *in cristallo* and *in vitro* validations will lead to new hypotheses about the mechanism of action of argon. A few interesting targets for therapeutic use of argon should emerge, together with their putative mechanism of action that would allow innovative development for argon as a medicinal gas.

The PhD student will be involved in the in-silico analysis of the database (ISTCT, Caen) followed by the biological validation of interesting targets, using crystallography under gas pressure (ISTCT, Caen) and in vitro assays (Air Liquide, Jouy en Josas). A specific aspect of his work beyond the scientific tasks will be to help coordinate the contributions of the various players providing the student with experience in project management in the context of pharmaceutical development.

The ideal candidate holds a master's degree in structural biology (or equivalent), has a background in molecular biology, programming skills (Python, Matlab, etc…), and is proficient in written and spoken English. Strong communication and teamwork skills, with the desire to work between academic and industrial research teams are mandatory to success in the PhD.

Deadline : June 24, 2019
Starting year: 2019
PhD advisors: ISTCT: Dr. Nathalie Colloc'h, PhD, Laboratory
Industry: Ira Katz, PhD and Geraldine Farjot, PhD
Funding: CIFRE (3 years)

Applications including a CV and letter of motivation should be sent by email to Nathalie Colloc'h : colloch@cyceron.fr and Ira Katz ira.katz@airliquide.com
Contact : Nathalie Colloc'h 02.31.47.01.32