Post-doctoral position in imaging of pulmonary physiology related to nitrogen gas in diving and hyperbaric conditions - Division of Hyperbaric Medicine and Department of Radiology

Brief overview of the project

Nitrogen gas (N₂) can be manipulated to include a radioactive, positron-emitting isotope (¹³N₂) and possible to breathe in experiments without too much radiation. We are developing the method in rodents before scaling it in larger animals and humans. The aim is to dive (compress) and decompress while breathing such gas and trace and image where the gas goes, potentially studying tissue gas and tissue bubbles in decompression. To analyze this we will work with positron-emission tomography combined with magnetic resonance imaging (PET/MRI).

- Specific aim 1: To develop a method for inhaling ¹³N₂ under pressure and imaging gas distribution in a live animal. This will allow direct tracking of Nitrogen gas throughout the body, which is key to mechanistically understand decompression sickness under different conditions.

- Specific aim 2: Quantitative measurements of Nitrogen gas uptake and distribution during compression and excretion during and after decompression in rodents.

- Specific aim 3: Scaling the method for large animals and humans.

The project involves animal experiments, application of biophysical models, functional PET and MR imaging methods, and physiological measurements to evaluate gas distribution in the body related to pressure changes. There will also be technical developments of gas delivery systems and compression chambers. In parallel there are also projects involving ventilation-perfusion studies in humans with MRI.

The successful candidate will join a multidisciplinary team of physicians, physicists and physiologists at a leading institution for the study of diving medicine and pulmonary imaging.

The ideal candidate should be a highly motivated researcher with a background in imaging or physiology and experience working with programming or mathematical analysis. Experience in scuba/technical diving or competitive breath-hold diving will be an asset.

Animal and/or human research experience is an asset.

Experience with image processing research is highly desirable. Experience in MATLAB programming and data analysis is also an asset. Candidates should have a doctoral degree (PhD or MD) with a track
record of scientific achievement as evidenced by peer reviewed journal publications. The position will consist of a yearly appointment with renewal contingent upon performance. Remuneration will be commensurate with experience and based on UCSD guidelines. The University of California, San Diego is an Equal Opportunity/Affirmative Action Employer. Applicants should send a cover letter outlining their research experience and interests, along with a curriculum vitae, copies of relevant publications and names and contact details of three references to:

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