	Experiment title: *Cerebratulus lacteus* hemoglobin mutants	**Experiment number**: MX394
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Names and affiliations of applicants (* indicates experimentalists):

Nardini Marco*

Dept.Biomolecular Sciences and Biotechnology

University of Milano

Via Celoria, 26, I-20131 Milano - Italy

e-mail: marco.nardini@unimi.it

Report:

A very short hemoglobin (CerHb; 109 amino acids) binds cooperatively O_2 in the nerve tissue of the nemertean worm *Cerebratulus lacteus*, to sustain neural activity during anoxia. The X-ray structure of oxygenated (1.5 Å resolution) displays deletion of the globin *N*-terminal A-helix, an extended GH region, a very short H-helix, and heme solvent shielding based on specific aromatic residues. The heme-bound O_2 is stabilized by hydrogen bonds to the distal TyrB10-GlnE7 pair.

Here, we report three data collections on a Lys(E10)Trp mutant. The rationale of this mutation was to perturb the hydrogen bonding network, present between the heme and the protein, to investigate the gating role of GlnE7 for diatomic ligands. We collected one data set at 1.6 Å resolution on the aquo-met crystals, one data set at 1.75 Å resolution on the deoxy crystals and one data set at 1.9 Å resolution on oxy crystals. After data analysis and comparison of the three structures, we could identify the structural events supporting the E7 gating mechanism for conveying a diatomic ligand to the heme.