LS-2211

ID09A
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Determination of crystallographic structure of neuroglobin mutants under high hydrostatic pressure to unravel the role of the large hem cavity in the mechanism

λ = 0.4104 Å
Detector : MAR 555
Distance : 512 mm

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Data collection

Neuroglobin native
- Compressibility curve from 1 bar to 4500 bar

Neuroglobin mutant F106 W
- Compressibility curve from 1 bar to 3500 bar
- Full data sets collected at 1 bar, 2800 bar, 3100 bar and 3500 bar

Neuroglobin mutant V101F
- Compressibility curve from 1 bar to 3700 bar
- Full data sets collected at 1 bar, 1500 bar, 2400 bar and 2900 bar

Neuroglobin mutant V104W
- Crystals are not diffracting

Scientific Results

The compressibility curve on native neuroglobin (Ngb) crystals obtained on ID09 is similar to the one previously obtained on SOLEIL (CRISTAL beamline), confirming that the results are not dependent of the beamline.

The different data sets collected on the two mutants have been refined. Resolution obtained are around 2 Å, enough to allow precise comparison of the different structures.

The analysis of the structures of the different mutants have revealed that they are more sensitive to pressure than the native. In the native, a loop is shifted toward the hem by the pressure. In the two mutants, the shift is this loop is inhibited due to steric hindrance.

The different structures of neuroglobin native and mutants at different pressures have allow to catch different conformational states of neuroglobin which occur during oxygen binding.

The publication describing these results is under preparation.