Researchers find mechanism involved in novel drug design with potential to treat tuberculosis

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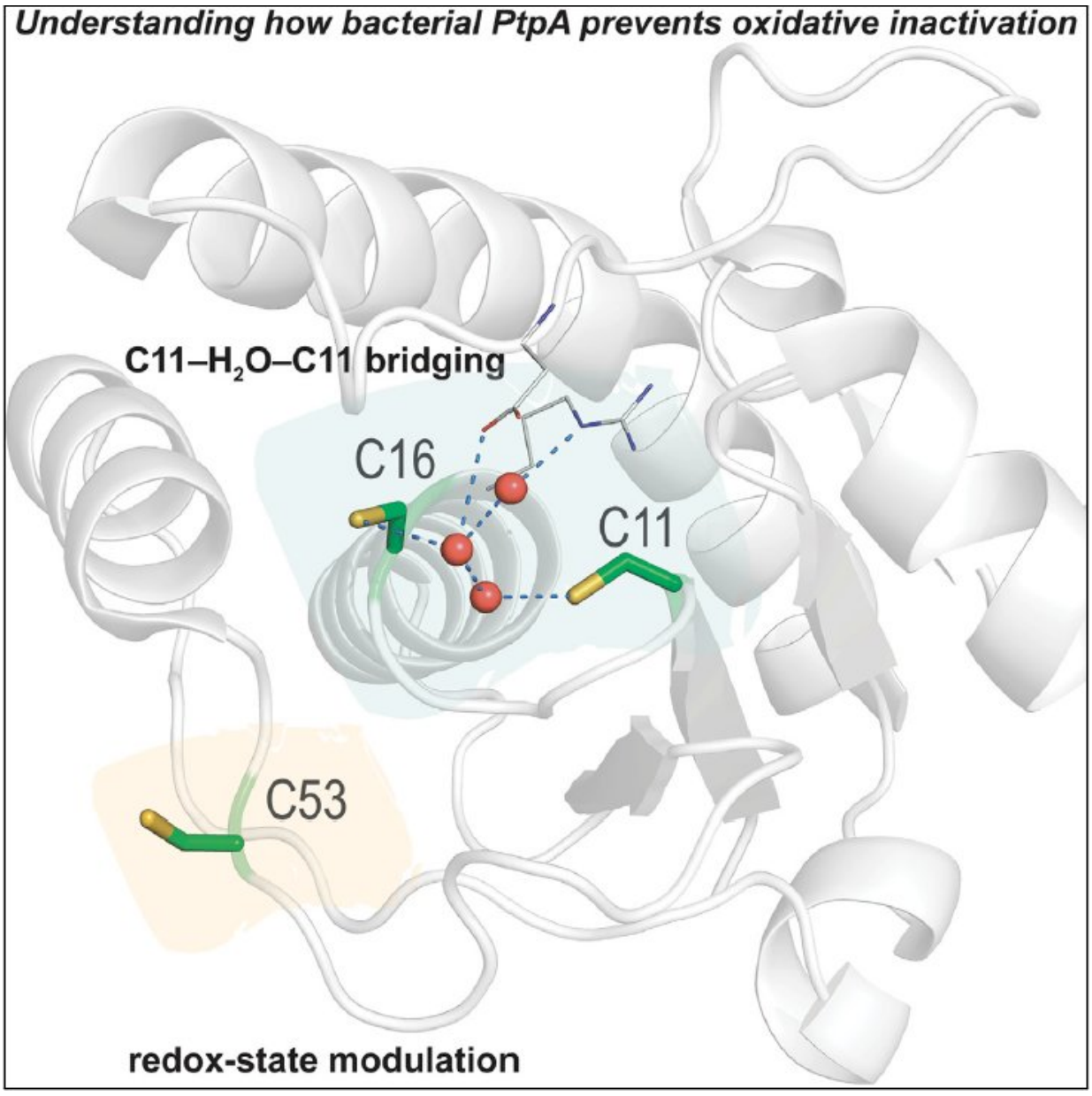

M. tuberculosis phosphatase structure with cysteine residues 11 and 16, that together with a network of water molecules (red) constitute an anti-oxidative shield. Credit: Gonçalo Bernardes Lab, iMM Lisboa

A team of researchers from Instituto de Medicina Molecular (iMM) Lisboa successfully used a new method to chemically modify a protein's components. Their results have potential medical applications and impact in the fight against tuberculosis.

To design novel drugs, it is essential to understand the molecular mechanisms that make up proteins of pathogenic bacteria. The team, led by Gonçalo Bernardes, used an innovative methodology that allows protein alteration in its native state, combining organic chemistry, biological computation, biophysics and biochemistry techniques to modify proteins involved in infectious diseases.

Researchers identified a novel molecular mechanism that works as a shield in a family of phosphate proteins that are present in pathogenic bacteria. In particular, the team observed the presence of a structural water molecule in a specific area that protects the protein from being inactivated by oxidative processes.

These results may impact the fields of medical chemistry and molecular medicine because they reveal a novel defence mechanism used by these pathogenic proteins. These findings may prove essential in drug design, particularly to increase specificity, potency and efficacy of future clinical tests.

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