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DISSERTATION TITLE:	*Substrate recognition and redox partner identification in nitric oxide synthase*

In this doctoral work, Inger Kirstine Olsbu and co-workers have increased the knowledge of two of the major branches of nitric oxide synthase (NOS) function. They have firstly confirmed the importance of subtle changes to the active site in mammalian NOS. Secondly, they have shown that under certain circumstances bacterial NOS is activated by a specific electron donor. This knowledge is valuable for industrial pharmacology as it can aid in the development of selective NOS inhibitors as well as potentially offer a novel strategy to combat staphylococcal infections.

Nitric Oxide (NO) is an essential signalling molecule in a wide variety of organisms ranging from bacteria to humans. Nitric oxide synthase is of biological importance and disruption of NO production have been linked to disease such as Alzheimer's and Parkinson's. In mammals there are three different types of NOS expressed in different tissues and with different but overlapping functions. However, the three share an almost identical active site which hamper development of specific drugs. Olsbu and colleagues have looked at how neuronal NOS binds different substrates and how subtle changes to the active site might impact this binding, aiding in the development of selective inhibitors.

Finally, they looked at bacterial NOS to establish how *Staphylococcus aureus* NOS is activated. Contrary to mammalian NOS which have a bound electron donor protein, bacterial NOS is believed to use any available electron donor protein. However, Olsbu found that under certain circumstances bacterial NOS might be largely dependent on a specific electron donor. The fact that, all NOSs share an almost identical active site even between species has hampered the development of selective inhibitors. Their discovery of a specific electron donor might give rise to a new potential drug target in staphylococcus.