

**P010** Ascorbate modulates the SUMOylated proteome  
**Melissa M. Grant<sup>1</sup>, Iain L. C. Chapple<sup>1</sup> and  
Helen R. Griffiths<sup>2</sup>**

*1. School of Dentistry, University of Birmingham, St Chads  
Queensway, Birmingham, B4 6NN; 2. Life and Health  
Sciences, Aston University, Birmingham, B4 7ET*

Oxidants and antioxidants (e.g. ascorbate, tocopherol) have been shown to have roles as second messengers through modulation of intracellular redox state. SUMO conjugating enzymes, which affect nuclear transport, signal transduction and transcription, are sensitive to the cellular redox environment. Whether oxidant/antioxidant-mediated redox changes affect the rate of conjugation of SUMO and mediate antioxidant signalling effects remains unknown.

A recent study in our group showed that ascorbate altered the proteome. In the neuroblastoma SH-SY5Y cell line, equimolar (100 $\mu$ M) co-treatment with ascorbate and H<sub>2</sub>O<sub>2</sub>, for 24h, induced expression of BDNF. To investigate whether ascorbate modulated the proteome via SUMOylation, the pattern of SUMOylation in SH-SY5Y cells was explored using proteomics. Comparison of protein SUMOylation patterns at 30min treatment with ascorbate (100 $\mu$ M) or H<sub>2</sub>O<sub>2</sub> (100 $\mu$ M) or control PBS demonstrated that 7 proteins were SUMOylated upon ascorbate treatment and that 2 of these were also modified by H<sub>2</sub>O<sub>2</sub> treatment. The presence of common proteins SUMOylated by ascorbate and H<sub>2</sub>O<sub>2</sub> suggests a common mechanism of action; it has been demonstrated that ascorbate generates hydrogen peroxide in cell culture media. The modulation of the SUMOylated proteome by ascorbate has highlighted targets for studying ascorbate-associated intracellular signalling changes.