KATIE ABLEY

I first became interested in plant science when I learnt about how plants modulate their development to suit environmental conditions. I am now particularly interested in the area of leaf morphogenesis.

First Degree	BSc Biology, with year in industry University of York, UK. Graduated July 2010
	Sainsbury Undergraduate Studentship (2008-2010) Vaction research: Investigating the regulation of chloroplast development University of Oxford Supervisor - Professor Jane Langdale Mentor - Professor Ottoline Leyser
PhD	**Sainsbury PhD Studentship** Interplay between axes in *Arabidopsis* leaf development. John Innes Centre Supervisor – Professor Enrico Coen Started October 2010

Summary of Vacation Project

Leaf development involves an interplay of activities between three major axes: proximo-distal, adaxial-abaxial and medio-lateral. In mutants that lack adaxial-abaxial asymmetry, medio-lateral outgrowth to form a leaf lamina fails to occur, producing radialised leaves. The link between the establishment of adaxial-abaxial polarity and growth along the medio-lateral axis is poorly understood. This lack of understanding stems partly from the fact that growth is an emergent property, arising from the interaction between gene activities and the physical properties of the growing tissue.

I am attempting to further understanding of how genes already identified to be important for adaxial-abaxial polarity and medio-lateral outgrowth in *Arabidopsis* interact to specify leaf growth. I have generated some computational models of how several hypothesised combinations of gene functions could regulate leaf growth, taking into account the interaction between specified growth and the physical properties of leaf tissue. These models have been used to generate testable predictions about the consequences of ectopic patches of gene expression on leaf growth. I am making genetic constructs which will generate fluorescently-labelled patches of ectopic gene expression. The leaf growth of plants transformed with these constructs will be analysed using a range of imaging techniques. By comparing experimental results with model-generated predictions, it will be possible to identify incompatible models and those that are consistent with experimental data, thus elucidating important principles underlying leaf morphogenesis.