PATRICK DICKINSON

I first became interested in plant science after being shown how plants have evolved incredibly complex interactions with their environment to cope with the demands of a stationary lifestyle. I am now particularly interested in the evolution of photosynthesis.

First Degree

Bsc (Hons.) Biochemistry
University of Edinburgh
Due to graduate June 2012

Sainsbury Undergraduate Studentship (2011-2012)
Vacation research – Regulation of cell specific gene expression in C3 and C4 photosynthesis
University of Cambridge
Supervisor – Dr Julian Hibberd
Mentor – Professor Andrew Hudson

Summary of Vacation Project

C4 photosynthesis has evolved independently in over 40 lineages of flowering plants. It involves fixing CO_2 as a four carbon sugar (OAA) in bundle sheath cells and the decarboxylation of OAA in mesophyll cells by dehydrogenases, concentrating CO_2 around RUBISCO and therefore favouring the carboxylation reaction of RUBISCO. Because of this plants which use C4 photosynthesis are up to 50% more productive than C3 plants in certain conditions. All genes needed for the C4 pathway are present in C3 plants and the aim of the project is to assess the extent to which these genes from C3 rice are able to be expressed specifically in mesophyll or bundle sheath cells in leaves of C4 maize and setaria.