Rachel Leech (1936–2017)

Rachel Leech, who died on 23 December 2017, made enormous contributions to the research field she loved – plant biology. She was an early pioneer of organelle biology, her passion being chloroplasts.

Rachel hit the field running as a student, developing methods to purify chloroplasts and mitochondria. In a landmark paper, published in 1964, she reported on the development of a method to isolate intact chloroplasts. Until that time, fragments of thylakoid membranes that contain the essential photosynthetic apparatus had enabled advances in our understanding of how the processes that relate to light perception and oxygen release can generate the reductive capacity that results in the fixation of carbon dioxide and the production of biologically-useful sugars. Virtually nothing was known then about how this complex photochemistry relates to the rest of plant cell biochemistry. Rachel's technically brilliant paper laid the framework for a wide range of future research in which chloroplasts might be viewed as functioning in a coordinated way within a wider cellular context.

A high-achieving woman in scientific research was still a relatively rare occurrence in those days. Rachel was fascinated by the functioning of chloroplasts, their interaction with cytoplasmic functions for photosynthesis and their structural complexity. She found that grass leaves provided an excellent system to study chloroplast sequential development and division. How chloroplasts divided was to become a topic that absorbed her attention for a large part of her career. She led the field of chloroplast development and division for many years, generating important knowledge on the 'energy producers' of the cell.

In the late 1980's Rachel started working on the model plant Arabidopsis in order to identify mutants and hence genes involved in the process of chloroplast division. This ground-breaking approach eventually identified several novel proteins involved in the plastid division process. Her work laid the basis for our knowledge of that organellar process today. In 2010, Plant Physiology selected its 25 most important papers among 25,000 previously published. One of those selected was Rachel's, relating to genetic analysis of chloroplast division and expansion – the sole UK exemplar.

Rachel grew up in Otley in what was then the West Riding of Yorkshire. She attended Prince Henry's Grammar School where her father was, for many years, Senior English Master. Rachel did her undergraduate and graduate studies at Oxford and then took up a lecturer position at Imperial College, London. She was recruited as a lecturer to the Biology Department of the new University of York in 1966 by the founding professor, Mark Williamson. The department had hired 'bright young things' and Rachel arrived having already won an Agricultural Research Council grant, enabling her young research group to get going quickly. She was to spend the rest of her career in York, much of it as a professor of the department. She trained many PhD students and post-doctoral fellows during this time. They were to feel part of the large 'Leech clan', led by a fearless, enthusiastic, Yorkshire matriarch who would always go the extra mile for her 'family'.

Rachel Leech was an inspiration and a strong role model for many young and contemporary woman scientists. She always aimed high, was well-funded and published extensively. She enjoyed travelling and spent many enjoyable months on short sabbaticals at UC Riverside. California and in New Zealand.

Rachel retired from the University of York in 1998, enabling her to enjoy her garden in York and spend time with her family. They - Jane her sister, her brother-in-law John her niece Alice and her nephews Martin, Paul and Philip - survive her. ■

Caroline Dean (John Innes Centre), **Mike Chadwick** (University of York) **and Dale Sanders** (John Innes Centre).