



# Media Release

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## GRANDPARENTS DON'T DESERVE CREDIT

An 'invisible' genome inherited from grandparents and credited with the ability to reverse the effects of a mutated plant gene sparked worldwide interest following a *Nature* article earlier this year, but CSIRO has found a better way to explain how the mutation was corrected.

CSIRO Plant Industry's Dr Abed Chaudhury shows in this week's *Nature* that the mutation could be fixed by the plant's own DNA resulting in healthy offspring free of mutation.

Dr Chaudhury says with a better appreciation of all the possibilities it is hoped that the real explanation, and the remarkable behaviour of DNA and genes, will be fully understood.

A mutated version of the 'Hothead' gene causes leaves and petals to fuse together in the plant *Arabidopsis*.

'Hothead' is a recessive gene so when two mutated versions of the gene are present in *Arabidopsis* it is just about inevitable, according to basic inheritance principles, that the offspring will also be mutated.

But in *Nature* (24 March 2005) it was reported that in a surprisingly large number of cases the offspring reverted to their non-mutated state and had leaves and petals that separated normally.

Essentially these offspring did not inherit the mutated versions of the 'Hothead' gene as expected.

Dr Chaudhury shows that short sequences of existing DNA elsewhere in the *Arabidopsis* genome provide an exact, albeit shorter, match of the mutated DNA of the 'Hothead' gene.

"The correct sequence of DNA is copied and then hybridises with the part of the DNA of the 'Hothead' gene which is mutated – correcting the gene in some subsequent generations," says Dr Chaudhury.

"We looked throughout the entire DNA of the plant, not just related genes, to find the short sections of DNA that could provide the correct template.

"It's like a company with two different products advertises under two different headings in the phone book – but one of the ads spells the company's name incorrectly.

"The editor then copies the spelling from the correct ad and pastes it over the incorrect spelling in the other ad – the next edition of the phone book will have both ads with the company name spelt correctly.

"In the case of the 'Hothead' gene the copying doesn't always work so sometimes the offspring are still mutated, but the fact that copying even occurs and has a high rate of success is amazing."

Dr Chaudhury's explanation is helping to shed light on this unusual 'corrective' phenomenon that may occur more widely than just within the 'Hothead' gene in *Arabidopsis*.

*Dr Chaudhury's Brief Communication 'Hothead healer and extragenomic information' is published in Nature, 1 September 2005. Information sheet available at [www.csiro.au/hothead](http://www.csiro.au/hothead).*

### More information

Dr Abed Chaudhury, CSIRO Plant Industry: 02 6246 5237

### Media assistance

Sophie Clayton, CSIRO Plant Industry: 02 6246 5139, 0418 626 860, [sophie.clayton@csiro.au](mailto:sophie.clayton@csiro.au)

If you would like to be removed from this mailing list, please contact [CSIROMedia@csiro.au](mailto:CSIROMedia@csiro.au) or 02 6276 6479.