'No-charge' journals: A choice for low-quality science?

From Narayan's letter[1], a clear message emerges that only journals demanding publication charges are worth publishing in. In his opinion, reputable scientists choose journals that charge for publication, and those who do otherwise represent a group of poor-quality scientists. One particular instance where the author mentions that 'not … all journals which do not charge for publication are of poor quality' does not weaken this message.

I do not agree with this opinion whatsoever. Indeed, there are journals that charge and those that do not charge for publication. Narayan's viewpoint is unfair to both the journals and their authors. His suggestion to spend about 20–25% of project funds on publication charges really cannot be disregarded so easily – in fact this much share of the project funds may help a researcher conduct a significantly more thorough and complex experiment. I do think that if a researcher has a limited amount of money, a common situation nowadays, he/she should spend it on research instead of on publication charges, provided that there are high-quality journals that do not demand publication charges and are of interest to the researcher. There are such journals.

1. Narayan, M. S., *Curr. Sci.*, 2007, **93**, 889.

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NEWS

Gene targeting in mice using embryonic stem cells: The 2007 Nobel Prize in Medicine or Physiology

Genetic variation, which is the basis of all genetic studies and breeding programmes, results either due to recombination causing reshuffling of genes/alleles, or due to mutations generating *de novo* genetic variation. Therefore, mutations are obviously more important as a source of genetic variation, but these events are often random and undesirable. Efforts in the past, therefore, have been made to induce useful and directed mutations in the desired direction, as was done by Michael Smith, who shared with Karry Mullis the 1993 Nobel Prize in Chemistry. Efforts have also been made in the past to insert foreign DNA in a living cell and then facilitate homologous recombination between this foreign DNA and the corresponding endogenous gene in order to repair or disable this gene in a desired manner; this phenomenon is described as gene targeting.

Although in the past, the major objective of producing mutations has been improvement of crops and livestock, a renewed interest in mutation research has been witnessed in recent years due to their utility in genomics research. As we know, during the last more than a decade, a large number of species of microbes, animals and plants have been subjected to whole genome sequencing, which is generally followed by functional genomics approach involving annotation of all genes, thus assigning function to each individual gene. A number of approaches for the study of functions of genes with known sequences and unknown functions are now available, the most important being the inactivation of genes through production of knockout mice. It is this research area that has been selected for the award of the 2007 Nobel Prize in Medicine or Physiology to three scientists, including two American scientists, namely Mario Capecchi (71 years old), University of Utah at Salt Lake City, USA and Oliver Smithies (82 years old), University of North Carolina at Chapel Hill, USA and one British scientist, Sir Martin J. Evans (66 years old), Cardiff University, Wales, UK. As is often the case, these three scientists had earlier won the prestigious Lasker Award in 2001.

Production of knockout mice

Production of knockout mice, each with a specific gene disabled, became possible due to the ground-breaking discovery of homologous recombination in cultured somatic cells by Capecchi and Smithies and due to the development of the technique for culturing embryonic stem cells (ESCs) by Evans. Later, the two techniques were combined and in 1989 several laboratories reported the successful production of knockout mice, which carried each a disabled gene[1–3]. The technique allowed the study of function of individual genes with far-reaching implications in biomedicine. Knockout mice for as many as 11,000 genes (almost half of the total number of protein-coding genes in a mouse) are now available. Hopefully, knockout mice for each individual mouse gene will become available within the next few years.

Transgenic mice, homologous recombination and gene targeting

During early attempts for the production of transgenic mice, integration of foreign DNA within the genome was found to be random, and the number of copies of integrated gene varied. Therefore, this could not be used for the manipulation of endogenous genes in a desired manner. Instead, transgenic mice with specific disabled genes could be produced using homologous recombination, a characteristic of meiotic cells in higher organisms and of sexual conjugation in bacteria. The