

### **Nobel Prize in Medicine**

The awesome story of Mario Capecchi, the 2007 winner of the Nobel Prize for Medicine is a paean to the indomitable spirit of man. When he was a child, his mother was sent to the Nazi concentration camps. From four and a half years of age to 9 years Mario struggled for survival on the streets with gangs of homeless children. Finally, he was hospitalized for malnutrition in a hospital in Italy, where his mother found him after searching for a year. Fortunes changed when they immigrated to the United States to live with his uncle, a physicist. Mario started out in physics and later switched to biology. He completed his thesis under the Nobel Prize winner James Watson and finally settled down in the University of Utah.

He has won the Nobel Prize along with Martin Evans of the UK and Oliver Smithies of the US for developing the principles of gene targeting. The technology spins out of Sir Martin's discovery of embryonic stem cells in mice. Mario Capecchi's great contribution has been the development of knockout mice. Knock out mice are genetically engineered mice in whom a particular gene has been made inoperable. It is a window to understand the role that gene plays in the organism. The knockout mice have colourful names such as the "Methuselah" knockout mouse which is famous for its longevity and the "Frantic" knockout mice which is used to study anxiety disorders.

Steps to producing a knockout mouse, are identification of the gene sequence to be studied and development of an almost similar DNA sequence. This sequence is then introduced into the mouse stem cells by electroporation (using electricity to transport DNA across the cell membrane). These stem cells are then introduced into a blastocyst which is then implanted into a female mouse uterus. The mouse which is born is studied for deficiencies which give us a clue as to possible function of the original gene.

Mario Capecchi attributes his tenacity as a scientist to the tough lessons he learnt as a homeless

child on the streets. "One of the things you have to do is be stupid enough to continue in a project when most other people give it up" says Capecchi. (Scientific American 8 October 2007, BBC News, 8 October 2007)

### **Nobel Prize for Peace**

The Intergovernmental Panel on Climate Change shares this years Nobel peace prize with former US president Al Gore. The panel was officially set up in 1988 and any country which is a member of the UN can be party to it. Its official mandate is to "assess the scientific, technical and socio-economic information that relates to human induced climate change." The Chairman is an Indian Dr RK Pachauri, who also heads The Energy Research Institute in New Delhi. The panel does not do original work but summarizes the research work of thousands of scientists all over the globe related to climate changes. There are 3 working groups in this panel: one which deals with the science of climate change, the second with possible fallouts on the biosphere and socio-economic conditions and the third with mitigation possibilities of climate change. There is alarming data to show that even one degree rise in temperature in rivers and lakes can cause many species of fish to disappear with an associated proliferation of invasive weeds. It has long standing impact on the health of billions of people who rely on fish as their main protein source. In India agricultural yields are likely to be impacted because of receding glaciers which result in drying up of rivers. A 2.5-10% decline in crop yield in the 2020's and 5-30% decline in the 2050's is projected. The award is a reminder to heed the early warning signs of global climate changes which may have long lasting impacts like large scale migrations and increasing competition for the worlds resources and violent conflicts (Indian Express, 21 October 2007).

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