Autism cure may finally be possible

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CIENTISTS have found new idence to show that manipu- ing a single brain protein can unter symptoms of a certain nd of autism. A group of sci- ntists from Bangalore and assachusetts have genetically wired the brain circuits in ice models to manipulate the esa ffect between a protein id a eceptor that helps brain lls communicate. The study ightens the prospects of cur- g autism, a brain development sorder that impairs social teraction and communica- on, and causes restricted and petitive behaviour.

Jumantra Chattarji, professor in e National Centre for Biological iences (NCBS), Dr B.S. ankaranarayana Rao of the ational Institute of Mental Health id Neurosciences (Nimhans) and ientists from the Brown Medical hool and Massachusetts Insti- te of Technology in the US collab- ated for this path breaking search work. The group's findings ppear in Thursday's issue of jour- l *Neuron*.

It is a brain disorder that affects social interaction

The study dealt with fragile X syn- ome (FXS), the leading known herited cause of mental retardation. he condition, tied to a mutated gene n th X chromosome, has effects ngi om mild learning disabilities severe autism, high anxiety and ileptic seizures.

"There is no current study in India for XS, but we do come across cases in ie clinic," said Sathish Chandra Giri- aji, a child psychiatry expert at mhans. There is no cure available for utism, though interventions can make ie condition better, he said.

FXS is caused by loss of the gene for agile X mental retardation protein FMRP). The loss of this protein, in rn, has a debilitating impact on brain rcuitry — especially on the synapses, ie connections between brain cells. hese patients have higher numbers of ynapses in their brains, but with an bnormal structure.

Picture: NIMHANS

Dr B.S. Shankaranarayana Rao.

Glutamate is the main neurotransmitter that mediates communication between neurons by activating a variety of receptors. One such receptor is called metabotropic glutamate receptor 5 (mGluR5). The current study investigated if overactive signaling by mGluR5 contributes to many of the symptoms of FXS.

To test this possibility, MIT scientists led by Mark F. Baer made use of mice that, due to a loss of the FMRP gene, exhibit many of the same symptoms commonly seen in FXS patients. These mice were then genetically manipulated to have a 50 per cent reduction in mGluR5. Strikingly, these mice display significantly alleviated symptoms related to FXS by preventing abnormalities in structure and function of synapses, synthesis of brain proteins, memory, epilepsy, and body growth.

"The experiment involved rewiring and remodelling of brain circuitry in mentally retarded mice models," said Rao. The impact was shown on spines or the small projection on the surface of the neuron branches that actually connect with other neurons through synapses.

"By knocking out mGluR5 we could transform immature spines into mature ones, making synaptic transmission normal," Rao said. "This work raises the hope that a drug blocking mGluR5 might effectively treat FXS and related autism spectrum disorders," said Chattarji. "This finding is particularly significant in light of recent initiatives involving an mGluR5-blocker called fenobam, a drug being developed for the treatment of FXS."

In collaboration with the Fragile X Research Foundation (FRAXA), the UK-based Neuropharm is developing fenobam for the treatment of FXS. Earlier this year the same Bangalore scientists teamed up with another MIT group and reported positive results from a different approach to treat FXS.

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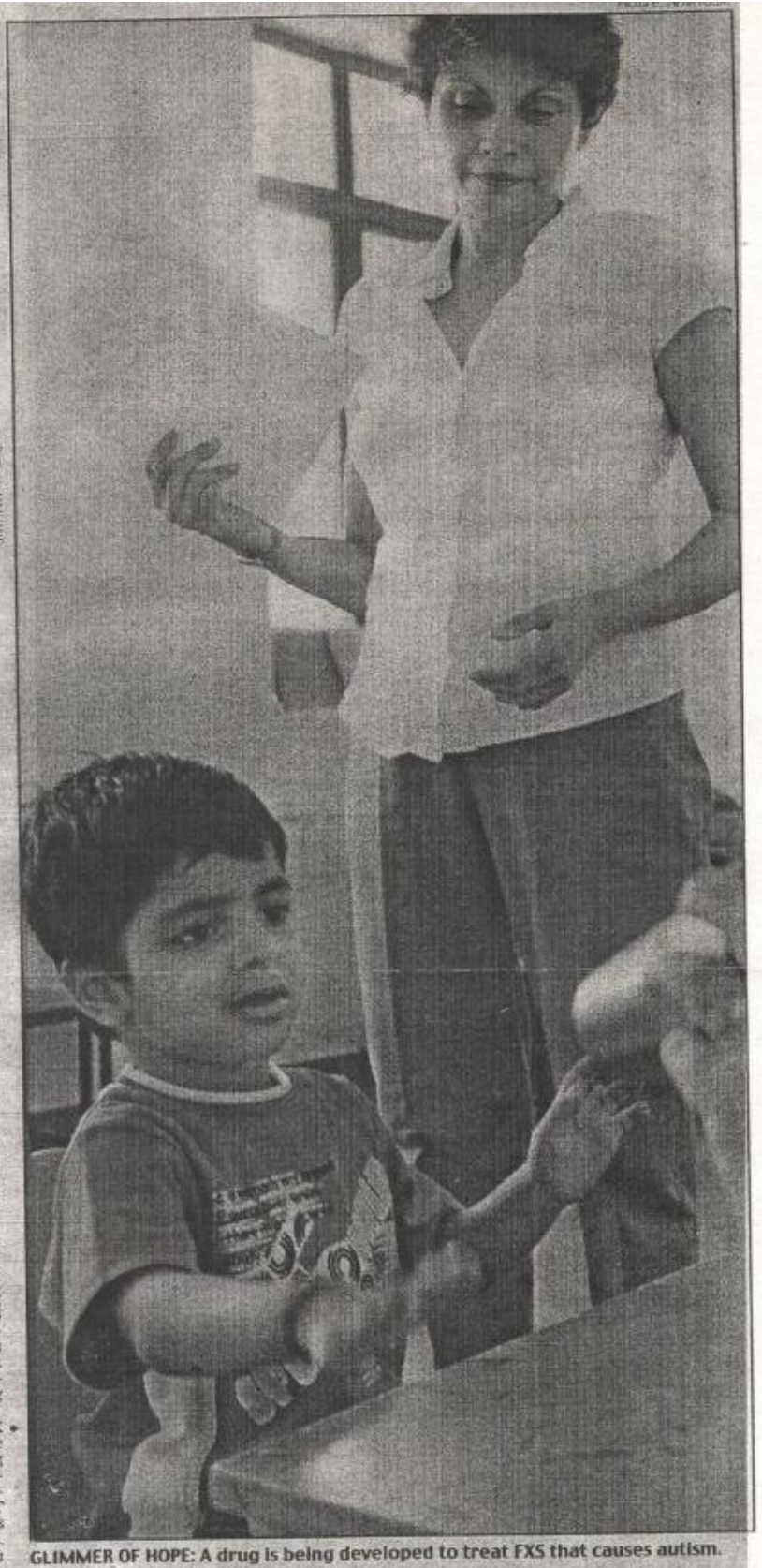

GLIMMER OF HOPE: A drug is being developed to treat FXS that causes autism.