

# Alzheimer's therapy bathes the brain in genes

Rhys Blakely Science Correspondent

A potential therapy for Alzheimer's that bathes the brain in a protective gene is to be tested on humans for the first time.

Scientists said that the trial on 15 patients could lead to people with high-risk DNA having genetic "tune-ups" to reduce their chances of developing the degenerative condition.

Despite billions spent on research, the cause of Alzheimer's is unknown and a cure remains elusive. For quarter of a century, however, scientists have known that inheriting certain genes heightens the risk of developing the disease, which affects about 500,000 Britons. The experi-

mental treatment, which will start trials in New York in May, will aim to infuse a protective gene into the brain cells of patients whose DNA is high-risk.

It is believed to be the only gene therapy being tested on people with Alzheimer's.

The work involves a gene known as APOE, dubbed "the forgetting gene". It comes in three versions: APOE2, APOE3 and APOE4. People who inherit two versions of APOE4 — one from their mother and one from their father — are between three and five times more likely to develop Alzheimer's.

If you inherit one APOE4 and one APOE2 the increased risk disappears. "From a gene-therapy point of view, the

## 500-mile hospital trip

A grandfather's family have to take a 500-mile round trip to visit him as no NHS treatment for his dementia is available nearer home. **Bernard Rundle, 66,** right, from



Saltash, Cornwall, who also has prostate cancer, was placed in a unit in Northampton. His family say he feels abandoned.

Sarah Rundle, 30, his daughter, said that the journeys had been heartbreaking.

Cornwall Partnership NHS Foundation Trust said that it was trying hard to find a place closer to home for him.

theoretical solution is obvious," Ronald Crystal, of Weill Cornell Medicine, which is part of Cornell University in New York, said. "Can we convert the APOE4 brain into a APOE2-APOE4 brain and take away the risk?"

The new therapy will involve large doses of laboratory-made APOE2 being delivered into the brains of 15 patients who have two copies of the high-risk APOE4.

"The basic concept is straightforward, the approach we're taking in humans is logical," Professor Crystal said. "Whether it will work or not we'll have to see."

The APOE2 genes will be inserted into a

benign virus, which should ferry them into the nuclei of the patients' brain cells. The viruses will be injected directly into the patients' cerebral spinal cord.

A needle will be guided into the spinal fluid with the help of imaging equipment. Only one injection will be needed and it will be an outpatient procedure.

When the APOE2 genes reach the brain cells they will not become part of the chromosomes where the patients' DNA is stored. Instead, the researchers hope that the new genes will remain in the cell and produce a type of protein that carries cholesterol and other lipids.

"The virus is like a trojan horse," Professor Crystal said. "It's going to carry the gene into the brain cells and then the brain cells will make the normal proteins."

Before permission was granted by US regulators for human trials, promising results were obtained in monkeys and mice.

The ultimate hope is that people with risky genes could be treated long before symptoms develop.

Dr James Pickett of the Alzheimer's Society, said: "This trial represents a new approach to genetic therapy for people with, or at risk of, Alzheimer's disease, and could pave the way for the first treatment to prevent or slow down the disease. We remain cautiously optimistic until we start to see results."