SCIENCE NEWS

CORONARY PREVENTION IN CHILDREN

Research at Exeter University in south-west England has led experts to believe that a programme of health education at an early age has a role to play in coronary prevention in children.

The pilot study, funded by the Northcott Devon Medical Foundation, the Oxenham Will Trust and Exeter University, involved monitoring haematological factors, physical activity patterns, cardio-respiratory fitness, smoking habits, diet, body composition and attitudes, in a hundred 12 and 13-year old children. The results will be formally published later this year.

A grant of £20,000 from the Northcott Devon Medical Foundation with substantial support from IBM and other local interests, has been awarded to the research team led by Mr Neil Armstrong from the University's School of Education.

The team will take the study to a larger population. Eventually a longitudinal study of all 12-year olds in the Exeter area is planned, to monitor risk factors and the effect of educational programmes being implemented and tested as a result of the research so far. (Further details may be had from Mr Neil Armstrong, School of Education, Exeter University, Exeter, England EX4 4QJ.)

NEW WAY SOUGHT TO FIGHT VIRUS INFECTION

Scientists at Oxford are working to devise vaccines which will protect against virus infection in a new way.

They will not prevent viruses getting into cells, but will trap the virus particles within infected cells inside lysosomes — vacuoles filled with enzymes which will dissolve virus particles before they get a chance to replicate.

Doctors Simon Collins and James Porterfield, of the Sir William Dunn School of Pathology in Oxford, worked out much of the molecular biology involved. Their starting point was the fact that the formation of antibodies against virus particles sometimes actually helps rather than hinders the infection process. In the cases of Dengue fever, for example, antibodies which become attached to virus particles assist the penetration of human cells.

The oxford team reasoned that if antigens in a vaccine provoke the sort of information which allows the kinds of antibodies which aid viruses to gain access to cells, then they can do more harm than good. A close look at the type of antibodies which vaccines evoke is needed. What is needed are antibodies which immobilise virus particles inside cells or in lysosomes.

In the cell's natural defence process, a lysosome is first acidified then, when the acidity reaches the right value for enzyme action, enzymes are poured into it to destroy particles trapped inside.

A virus particle has only a very limited time to escape from this trap. But it all-too-often manages it by stripping off its outer protein coat and fusing inner proteins with the membrane around the lysosome, thus forming an escape hatch through which the now-naked DNA of the virus can escape into the body of the cell. Then the viral DNA is ready to merge with the cell's own DNA so as to take over control of the cell and order it to make more virus particles.

The Oxford team has shown that the escape of a virus particle form a lysosome can be prevented by appropriate antibodies for at least one virus, the West Nile fever virus. The antibodies bind to the viral coat protein which would normally fuse with the lysosome membrane, and so prevent escape.

The next step is to identify more viral antigens in other viruses which fuse with lysosomes and so allow viral particles to escape. Then it may be possible to make more experimental vaccines containing only such antigens. which would prevent viral replication by trapping virus particles inside lysosomes. In this way it may ultimately be possible to make vaccines which are much more effective than those of today.
