

# Local mathematician helps determine how soft in the head we really are

BY DECLAN VARLEY

A team of Chinese researchers from Tsinghua University in Beijing has collaborated with an applied mathematician at NUI Galway to measure how soft brain matter really is. The researchers were able to determine that brain matter is extremely soft, even softer than common gelatine. The study appears in the October issue of *Biomechanics and Modelling in Mechanobiology*.

Professor Michel Destrade, School of Mathematics, Statistics and Applied Mathematics at NUI Galway and affiliated with the International Brain Mechanics and Trauma Lab at Oxford University said: "Previously I had compared the brain to glue by testing cubic samples of the brain. During this study the brain was fully intact and compared to a very, very soft gelatine gel, basically a wobbly liquid."

Results from the



Professor Michel Destrade

research showed that brain matter is at least three times softer than a gelatine gel. This extreme softness helps explain why brain matter is so susceptible to impacts and rapid accelerations of the head, such as those occurring in sporting accidents, car accidents or following a bomb blast.

The research has promising results for neurosurgery, if it can

be used to measure the stiffness of healthy tissue compared to that of brain tumours. At the moment neurosurgeons have to rely on crude estimates to determine the extent of a brain tumour, as it is visually undistinguishable from the surrounding healthy tissue. First they remove a part of the skull to access the brain, and then use finger palpation to estimate how soft or hard a

region is, before deciding which part to remove, a procedure which has barely improved in the last 100 years. For more information contact Professor Michel Destrade, School of Mathematics, Statistics and Applied Mathematics, NUI Galway on michel.destrade@nuigalway.ie or 091 492344.