New ways to treat debilitating brittle bone disease

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Scientists at the University of Sheffield have discovered new ways to help detect and treat the debilitating brittle bone disease osteoporosis.

According to a scientific study published today (Thursday 19 April 2012) in the European Journal of Human Genetics, women with a faulty gene have lower bone mass and lose nearly 10 times more bone than women who have a correct copy of a receptor for the energy molecule ATP- (the P2X7 receptor).

Osteoporosis is a devastating condition that affects half of all women and a fifth of men over 50 in the UK. The disease can reduce quality of life and more than a 100,000 people die each month because they are not diagnosed and treated early enough.

Dr Alison Gartland from the University of Sheffield, who is leading the research which is funded by Arthritis Research UK, said: "This research is really important as it may help identify women who are at more risk of developing bone diseases such as osteoporosis."

This latest finding follows on from earlier work by the team, published in the *Journal of Biomechanics* in January 2012, which discovered how individual cells in our bones respond to the stresses and strains every day when we walk, climb stairs or even raise a glass of wine or beer.

"Bone cells release different amounts of the energy molecule ATP depending on the type of mechanical loading or stress that they

experience", added Dr Gartland.

"We know that exercise is important to build strong healthy bones, but this latest research might explain how it works. If drugs can control the release of ATP during exercise it could help build bigger and stronger bones."

The team also investigated the way cells detect and control the amounts of ATP released. They found that when a receptor called P2Y13 was changed it slowed down bone loss that would usually cause osteoporosis. This led them to suggest that a drug to switch off this receptor could reduce the onset of osteoporosis, in a third academic paper published in the journal *Molecular Endocrinology* in January of this year.

Dr Gartland, who is based at the Mellanby Centre for Bone Research at the University of Sheffield said: "It's when things go wrong that diseases such as osteoporosis develop – and then our bones can break as easily as snapping a breadstick.

"We are really excited by these results as it gives us three new ways to try and tackle bone diseases. We have been working very hard over the past few years using a variety of approaches to better understand how our bone cells work, how they communicate with each other and how that can go wrong."

Dr Gartland will be presenting her group's work early in the summer at a series of international meetings in Oxford, Tokyo, and at the annual meeting of the Bone Research Society and National Osteoporosis Society, whose patron is the Duchess of Cornwall, in Manchester.

More information: *Eur J Hum Genet.* 2012 Jan 11. doi: 10.1038/ejhg.2011.245
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