

Skull bone may hold the key to tackling osteoporosis

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Scientists at Queen Mary, University of London have uncovered fundamental differences between the bone which makes up the skull and the bones in our limbs, which they believe could hold the key to tackling bone weakness and fractures.

It is well known that bones in the arms and legs become weak and vulnerable to breaks when they are not maintained by weight bearing exercise. However [skull bone](#), which bears almost no weight remains particularly resistant to breaking.

The new research published in *PLoS ONE* offers an explanation for this phenomenon for the first time. The researchers say that their new understanding of the differences between the two types of bone could lead to new ways to treat or prevent [osteoporosis](#).

People who develop osteoporosis have fragile bones which are prone to breaking. The condition becomes more common as we age, especially in post-menopausal women when levels of oestrogen fall dramatically. In the over 50s it affects half of all women and a fifth of all men.

The researchers wanted to understand why the skull bones are resistant to bone thinning as they age, even in post-menopausal women.

To investigate this, they looked in detail at rat [bone cells](#) from the [skull](#) and compared them with cells from limb bone. They found differences between the appearance of the cells and how they behaved in the lab.

They also noticed that treating the cells with oestrogen had a far greater effect on the cells from the limb bone.

Because the differences are so profound, the researchers believe that they are set very early on in life - probably when the bones are still forming in the womb.

The researchers also made a detailed genetic study of the two types of bone cell. They looked at which [genes](#) were active in the two types of cell and found a startling level of difference between the two. They found a total of 1236 - around four per cent of the [genome](#) - were showing different levels of activity in the two types of bone cell.

Among these they found a number of genes which are known to be involved in the process of forming healthy bones.

Lead author, Dr Simon Rawlinson, Lecturer in Oral Biology at Queen Mary, University of London, explained: "This research is exciting because it tells us why our skulls remain so tough as we age compared to the bones in our arms and legs.

"Now we understand this phenomenon better, we also understand osteoporosis better. And this has opened up many new lines of research into how the disease could be treated or even prevented."

Provided by Queen Mary, University of London

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