

## **Press Officer**

### **Radiation information organisation**

Research from Sweden and the US finds no evidence that people who use mobile phones have a greater risk of brain cancer.

The only evidence is that mobile users are more likely to get one particular type of brain cancer. They are actually less likely to get other types of brain cancer. Does this mean microwaves protect against the other types of cancer?



There is a problem with the research into mobile phones and brain cancer. The scientists only looked at a few hundred people. This is not enough. The finding could be an 'accident'. Just like when you toss a coin a few times you could end up with all heads.

At the moment there is no strong evidence of any health risks with mobile phones. The World Health Organisation is carrying out a large European study looking at 3000 people with brain tumours. It will be several years until we know the results.

## **Writer**

### **Author of a book tracing the history of radiation use**

We now know that X-rays can be dangerous. But one early use of X-rays was at fun fairs. People put their hands in a strong X-ray beam so they could see the bones in their hands.



X-rays are used in medicine to photograph people's insides. But in the past, doctors sometimes used very high doses because they did not know the dangers. For example, they used strong X-rays to search for breast cancer. In the early days they may have caused more cancers than they found.

Microwaves are another form of radiation and they may turn out to be as dangerous as X-rays. It looks unlikely on the basis of the current evidence, but the lesson of history is that we should be very careful with new uses of radiation. We will be able to relax more when scientists have thoroughly investigated the possible effects on our bodies.

## **Scientist**

### **Research group looking into mobile phone safety**

Scientists in Sweden looked at 200 people with brain tumours. They found no evidence that using a mobile phone increased the chance of having a tumour. But, mobile phones users were over twice as likely to have a tumour near their phone ear than in other parts of the brain.



Scientists in the US did similar research, using 450 people with brain tumours. Again they found no evidence that using a mobile phone increases the chance of having a tumour. But there were more than twice as many mobile phone users who had a particular type of tumour (called a neurocytoma) compared with people who did not use mobile phones.

We must be careful. Firstly, the number of mobile phones is increasing at an incredible rate. So even a tiny increase in the risk of brain cancer could cause many more deaths across the world.

Secondly, brain tumours can take many years to develop. Mobile phones have not been around for very long. So it might be a long time before we find out whether or not mobile phones cause brain cancer or not.

## **Marketing Director**

### **Mobile phone company**

Scientists do not understand how microwaves could cause cancer. Some other types of radiation with higher energy can cause cancer. They do this by changing the DNA molecules in cells. Microwave radiation has too little energy to do this.



Microwaves do heat up cells. This is how microwave ovens work. If you heat cells in the body enough you damage them. But microwaves from mobile phones are far too weak to do this. Mild exercise will heat up your brain cells more.

Mobile phone masts do give out more microwaves than phones. But the amount of radiation you receive from a mast is very small. This is because the masts are much further away than your phone. The strength of radiation drops very quickly the further away you get.

## Some more recent research

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Scientists are more likely to believe in a link between microwaves and brain cancer if they understand how microwaves could cause this effect.

This table summarises some more recent research.

Experiments and findings	Comments
<ul style="list-style-type: none"> <li>▪ Scientists exposed some tiny nematode worms to microwaves</li> <li>▪ The worms grew 5% faster</li> </ul>	<ul style="list-style-type: none"> <li>▪ If microwaves can cause cells to divide more quickly, they could be affecting the DNA in the cell</li> <li>▪ Changing DNA can cause cancer</li> </ul>
<ul style="list-style-type: none"> <li>▪ They exposed rats to microwaves</li> <li>▪ They found changes to several brain chemicals which we know affect memory and alertness</li> </ul>	<ul style="list-style-type: none"> <li>▪ Studies with humans have shown no effect on short-term memory</li> <li>▪ Other scientists have not been able to repeat these findings</li> <li>▪ Some human research suggests microwaves speed up reaction times</li> </ul>
<ul style="list-style-type: none"> <li>▪ They looked at how microwaves affect different cells in slices of rat brain</li> <li>▪ They found that microwaves weaken the response of cells in one part of the brain (the hippocampus)</li> </ul>	<ul style="list-style-type: none"> <li>▪ The hippocampus is too deep in the human brain for weak microwave radiation to reach it</li> </ul>
<ul style="list-style-type: none"> <li>▪ The scientists exposed some mice to microwaves</li> <li>▪ These mice were twice as likely to get a particular type of cancer (called a lymphoblastic lymphoma)</li> </ul>	<ul style="list-style-type: none"> <li>▪ They used genetically engineered mice who were more likely to get this type of cancer anyway</li> <li>▪ Other researchers have not been able to repeat the results</li> </ul>
<ul style="list-style-type: none"> <li>▪ The scientist has a theory that microwaves affect the waves that came from the brain itself</li> <li>▪ The frequency of the radiation from mobile phones matches the frequency of brain waves</li> </ul>	<ul style="list-style-type: none"> <li>▪ This theory has not yet been tested, so scientists have no evidence for it</li> </ul>