

# Alert Over The March of The 'Grey Goo' in Nanotechnology Frankenfoods

By [Sean Poulter](#)

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A breed of Frankenfood is being introduced into human diet and cosmetics with potentially disastrous consequences, experts said last night. Academics, consumer groups and Government officials are warning that the arrival of nanotechnology threatens dangerous changes to the body and the environment.

The particles it uses are so small – 80,000 times thinner than a human hair – that they can pass through membranes protecting the brain or babies in the womb.

Nano health supplements, such as antioxidants, are already on the market while the first of hundreds of new foods are expected to arrive in the next 12 months.

However, the products are being introduced without any regulation or independent assessment to ensure they are safe – mirroring the controversy over the launch of GM foods ten years ago.

Some critics have talked of the threat of the creation of a “grey goo” of tiny particles with hidden harmful properties.

Prince Charles has said it would be “surprising” if the technology did not “offer similar upsets” to thalidomide – the morning sickness drug that caused children to be born with deformed limbs.

Professor Vicki Stone, Professor of Toxicology at Napier University in Edinburgh, is concerned about unforeseen side effects.

“We know very little about the ability of nanoparticles to move around the body, to accumulate or to be excreted, or their potential to cause toxic effects in organs,” she said.


However, nanotech advocates have remarkable claims for the technology. For example, foods are in development that are said to stave off the aging process.

On a more trivial level, they suggest it would be possible to create a fizzy drink that changes flavour according to the number of times the can is shaken.

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The consumer group Which? is about to launch a nanotech campaign arguing that consumers need to be consulted on the risks and benefits before it is too late.

The food and farming department Defra has published an independent report which admits there are serious gaps in safety data.

It warns: "There could be very significant implications for business and the wider community if potential risks are not identified and managed before any harm to the environment or human health may be done." 

The report – Characterising the Risks Posed by Engineered Nanoparticles – states there is a shortage of research money.

It says the resulting absence of basic information about the particles means "it will be difficult or impossible to develop any general understanding of nanoparticle toxicology".

The report adds: "Transfer across biological barriers – e.g. to the brain or foetus – should be studied. Research into how long these tiny particles persist in the body is urgently needed."

It warns that work assessing human toxicology is being hamstrung by "profound difficulties in accessing relevant funding for these longer term projects".

Research by Which? found six out of ten people (61 per cent) have never heard of nanotechnology.

Sue Davies of Which? said: "The benefits that nanotechnologies can offer consumers are really exciting.

'But before the market is flooded with products, it's crucial the Government addresses the lack of scientific understanding about how some nanoparticles behave."

The European Food Safety Authority last year held a conference on the future of food.

Dr Donald Bruce, an expert on food and ethics, told delegates that the arrival of nanotech foods has many similarities with GM products.

US corporations attempted to introduce GM before an effective safety regime could be established.

"One of the things to ask is do we need the benefits claimed by the producers?' he said. 'Also there is the underlying notion that we are tampering with nature."

Environment minister Phil Woolas admitted there were gaps in knowledge, but denied the Government was failing to provide enough research cash.

Tiny particles that have generated great hopes and growing concerns

Nanotechnology involves using a substance in particles that are so small that the substance takes on new properties.

The name of the technology comes from the size of the particles – one nanometre in diameter – a millionth of a millimetre. Reduced to this size, materials can suddenly show very different and unexpected properties.

For example, an opaque substance such as copper becomes transparent, or an inert metal

such as platinum becomes a catalyst and triggers chemical reactions.

Advocates argue that such particles can be organised to work together to deliver specific effects in a piece of equipment or in the human body.

They can be used to build miniature hard drives that have an immense memory, so allowing further miniaturisation and sophistication of products such as computers and mobile phones.

Washing machines have been developed that release silver nanoparticles that will kill bacteria in dirty washing.

Sun creams have been created so they become transparent rather than chalky white.

In medicine, it is claimed that nanotechnology will allow the creation of drugs that reach and treat a problem quickly.

Manufacturers are working on nanotech foods and supplements that are also designed to deliver specific health benefits.

Similarly, firms are working on developing anti-ageing foods, where nanotech particles associated with renewing the skin from the inside could be included in everyday products such as yoghurt, spreads or breakfast cereals.

The technology promises huge riches for firms which develop winning applications.

One of the first group of nanoparticles being utilised are fullerenes – tiny hollow carbon balls and tubes. They are very heat resistant, strong and conduct electricity.

The football-shaped C60 fullerene is being used in some anti-ageing products. The creams are said to reduce fine lines and firm the skin.

C60 has some antioxidant properties in that it kills the rogue chemicals which damage cells. However, a high dose can itself damage cells.

Some nano particles are known to mimic the harmful effects of asbestos on the lungs. Consequently, they have the potential to trigger lung cancer if inhaled.

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