**Submission No 7**

# INQUIRY INTO NANOTECHNOLOGY IN NEW SOUTH WALES


**Organisation**: Member of the NSW Legislative Assembly

**Name**: Mr Paul Pearce MP

**Telephone**: 93896669



**Date received**: 26/03/2008

Submission to the Standing Committee on State Development

***Inquiry into Nanotechnology in New South Wales***

I thank the Committee for the opportunity to make a submission on the issue of Nanotechnology.

Nanotechnology and its uses are a relative new area of science. However, notwithstanding its relatively recent development, it is use is already become a significant component in a range of products from cosmetics, to clothes to foodstuffs.

Views on the potential of nanotechnology vary widely. To quote just two views as cited in *The Ecologist* magazine:

**Promise**: " *The importance of nanotechnolgy to the future of mankind cannot be overstated. Nanotech's promise is clean industries, cures for disease, nearly unlimited energy supplies....and perhaps the end of hunger*" Mark Modzelewski, Executive Director of Nanobusiness Alliance

**Risk**: " *Nanotech accelerates a technofix trend that looks to technology as the solution to the world's most pressing problems, overriding issues of safety security and equity. Potential productivity gains through genetic engineering are touted as the answer to hunger, though distribution and access rather than production is the problem.....Nanotechnologies will..offer governments even broader opportunities to avoid enacting necessary social, political and economic change. Nanotech threatens even further to divert funds, knowledge and political will away from research necessary to address society's problems in a systemic manner and from policies and practices that will tackle the root causes of hunger.....and the degradation of the environment.*" Patrick Murray, Senior Policy Adviser, Intermediate Technology Group.

**Issues to consider when looking at the potential and the impact of Nanotechnology :**

( *the following issues are those that I have identified from reading on the subject. They are by no means exhaustive. The sources vary, however, should the committee require detail, I will make every effort to identify)*

**Food and Agriculture**: the potential uses for Nanotechnology is in agriculture range from tailoring food to individual taste buds, tailoring foods for individual nutritional profiles including vitamin deficiency indicators in the packaging, so called nutraceutical foods that can utilise proteins to target specific areas of the body, to name just a few. In agriculture it potential use in monitoring soil conditions and the possible targeted delivery of pesticides and agricultural chemicals. The potential benefits, particularly to large scale agribusiness are obvious. Less obvious however, is how underdeveloped nations, dependent on expensive technology transfer and patent costs will benefit.

**Medicine:** The proponents of the technology point to the potential for faster and better targeted drug delivery. In addition due to properties of common elements- such as gold- at nano level there is a potential for speeding up drug development, particularly when combined with gene technology. Further claims in the medical area centre around faster and increased accuracy is diagnostic procedures. The University of Cambridge has researcher looking at the potential for better imagine by use of nano particles.

Again the potential benefits to the pharmaceutical companies are obvious. Similarly, the potential to treat what are often identified as "life style diseases" in the affluent West, is obvious. What is

less clear is what are the risks of this technology. The very properties which provide the potential- the capacity of nano particles to pass through the skin, cell walls, the change in how common substances behave at nano level- also provide the risks.

Professor Vyvyan Howard, Department of Human and Cell Biology, University of Liverpool, is quoted (in *The Ecologist) : "When particles that are normally harmless are converted into ultra fine particles, they tend to become toxic. The smaller the particles, the more reactive and toxic they generally become.....Chemists can apparently design ultra fine particles ( UFP) that can hoodwink certain body membranes into allowing 'piggybacking' of novel chemicals on UFPs across..membranes. However, this means that when environmental UFPs gain unintentional entry to the body, this same mechanism can deliver them to vital organs. The body is then 'wide open' to any toxic effects that they can exert."*

As with other technologies- such as nuclear power and genetically modified organisms- the claims made by the proponents often ignore or downplay the risks. From my reading on the subject it is apparent to me that issues of toxicity- particularly in the light of the impact of the new properties of the nano particles- have not been assessed by longitudinal studies. As a general comment, past experience has shown that non predicted and unpredicable secondary effects can develop over time. Where there are insertions into viruses and other organisms, this risk cannot be ignored.

The US *"Food and Drug Law Institute and the Project on Emerging Nanotechnologies" (part of the Woodrow Wilson Centre)* at a conference held on 28-29 February, 2008, heard a keynote address from Michael R Taylor, director of the project. His specific address was to discuss regulatory issues confronting the US regulatory bodies, particularly the Food and Drug Administration (FDA). Without seeking to replicate the content of the address, I would bring the following quotes/issues to the Committee's attention and would suggest their relevance to the Committee's deliberations:

*" If you'd like a more scientific synopsis of the new issues posed by nanoscale materials, as they affect FDA oversight, I can recommend no better source that the July 2007 report of the FDA's own Nanotechnology Task Force. As the Task Force points out, the toxicity of nanomaterials may vary not just with mass but also with surface area, reactivity and electrical charge.*

*This does not mean that nanoscale particles are necessarily unsafe, but it does mean that we cannot assume their safety based on what we know about the conventional scale version of the material.* ***At least for now, de novo, case-by-case safety assessment is required"***

*" ..a subcommittee of the FDA's Science Board...specifically included nanotechnology among a group of emerging technologies its doubts the FDA can adequately regulate for lack of science capability and capacity."*

*"From a safety point of view, the greater concern is for cosmetics and dietary supplements, products that seem to be leading the way to the market place* ***but are generally not subject to an FDA pre-market safety review"***

*"..whether a product is subject to FDA pre-market review or not, companies should be open with FDA in providing information on products under development and how the companies are addressing safety evaluation..."*

Mr Trevor Davies, a senior adviser to the P*roject on Emerging Nanoechnologies* at the Woodrow Wilson International Center for Scholars and a former EPA official, in commenting on a report release in January 2006, said that its time to start discussing changing laws- perhaps drafting new

ones- to identify and protect the public from any risks that may crop up in future. *"The technology is new but it's not so new that it's not being commercialized" " We've learnt with biotech and nuclear power, if there are not adequate safeguards, the public is going to resist the technology and it won't meet its potential."*

*( reference Live Science magazine, January 2006)*

I have cited both Trevor Davies and Michael R. Taylor at length to highlight the regulatory concerns being raised in the USA. Both, as you can appreciate are not opposed to the technology per se, however, both recognise that the current regulatory framework and testing framework are not sufficiently rigorous. I do not believe that I would be wrong in assuming that the same scenario exists in Australia. Yet, as we are all aware these products (particularly in the cosmetics field) are already commercially available.

**Conclusion**

From my reading on this subject and my (limited) discussions with scientists who are familiar with the risks and potential benefits, I have come to the conclusion, that we run the risk of yet another technology being 'out in the market place' before the long term affects are fully assessed. It is clear from the US that the necessary independent testing by regulatory authorities is not taking place. Clearly those authorities are reliant upon research carried out by the commercial promoters of the products. Increasingly in recent years, we have seen drug recalls and other product recalls, due to the inadequacy of pre-market testing for toxicity and unexpected side effects. In a technology that has the capacity to enter the very structure of the cells of living organism, this lack of longitudinal studies of impacts and side effects boarders on the negligent.

There is an absolute need for a precautionary principle to be adopted and the need for a regulatory regime that ensures adequate testing and result verification independent of the potential commercial beneficiaries.

I would suggest that it is also legitimate to consider the broader social implications of the direction of research funds toward this type of technology, rather than addressing the identifiable social needs extant due to prevailing social structures. For example: do we need further "hi-tech" investment into agricultural technologies, when the problem of hunger is a distributional/ wealth allocation problem created by prevailing social structures? I appreciate that this would be beyond the brief of the Committee, but I would like you to dwell upon it nonetheless.

Paul Pearce, MP
Member for Coogee
ph. 93896669
paul.pearce@parliament.nsw.gov.au