Nanotechnology: The next asbestos? Government fails to protect and denies our right to choose

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• Sunscreens contain nano zinc (30%) and nano titanium (70%) (2006)

• What’s wrong?
  – Nanoparticles can produce free radicals that damage DNA, especially with UV exposure
  – Nano zinc is absorbed through skin and reaches blood and urine in humans
  – Inhalation caused inflammation of mice lungs, crossed placenta of pregnant mice, and resulted in behavioral changes in baby mice
  – Nano zinc oxide more toxic to human colon cells (than bulk form)
  – “the worst case scenario, I suspect, could be development of cancer. But we don’t know. That’s what we’re trying to find out” Dr McCall, CSIRO.
Lessons from that hot summer - what I will discuss tonight...

- The genie is out of the bottle - we are already exposed to nanomaterials
- Lack of regulation and labeling fails to protect public health and the environment, and citizens right to know
- Australia lags behind in nano-regulations
- There are strong calls internationally for a moratorium
- Citizen action will be imperative to shape the future of this science - ‘Australian Cancer Council’ (and others) withdrawal of nano sunscreens
Nano food and farming

- Manufactured nanomaterials are already used in some food products, nutritional supplements, many packaging and food storage applications and some agricultural inputs (e.g. fertilizers and pesticides)

- Global agri-food companies investing in nano: Nestle, Kraft Foods, Unilever, Cargill, Pepsi-Cola, Syngenta, Monsanto
Between 150-600 nano foods and 400-500 nano food packaging applications are already on the market (Cientifica 2006; Daniells 2007; Helmut Kaiser Consultancy Group 2007)

By 2010 it is estimated that sales of nano foods will be worth almost $6 Billion (Cientifica, 2006)
Nano - From Farm to Fork

**Nutritional supplement drink:**
nano iron drink mix for toddlers
offers increased bioavailability
(Toddler Health)

**Food contact material:** nano silver
baby mug with increased antibacterial properties (Baby Dream)
**Food packaging:** Cadbury Chocolate and Miller Beers also employ nano packaging/containers. (Carbon nano tubes to detect toxins/food spoilage)

**Food additives:** nano capsules of water insoluble substances are used to increase absorption in the body, (Tip Top Up)

**Plant Growth Treatment:** PrimoMaxx nano emulsion (Syngenta) and ‘gutbuster’ microcapsules
Failure to regulate, test and label

- Currently no nano-specific regulations to oversee research, manufacture, commercial application, and disposal of nanotechnologies,
- No comprehensive labeling
- This will exacerbate health and environmental problems and citizen mis-trust
- Patchwork of non-nano specific regulations:
  - Therapeutic Goods Administration (TGA), Food Standards Australia New Zealand (FSANZ), National Industrial Chemicals Notification and Assessment Scheme (NICNAS) and Australian Pesticides and Veterinary Medicines Authority (APVMA)
- “truck-sized loopholes” that enable unfettered development of nanotechnologies
  - Nano is new, but not treated this way
  - Mass thresholds, nano don’t trigger regulations
Australia out of step with international trends

- EU Parliament’s Environment Committee - bans nano foods (May 2010)
- The European Union's Food Safety Authority recognises that some nanomaterials can pose serious new health and environmental risks, although there are still many serious knowledge gaps
- UK’s Royal Society and Royal Academy of Engineering recommended nano-ingredients should be subject to new safety assessments and face mandatory product labelling
• Organic food movements ban nano food (Australia, Canada)
• Over 40 union groups calling for moratorium on manufacture and use of nano materials
• Surveys have shown that accurate food ingredient labelling, including in relation to nanotechnology and GM, is very important to Australians
• Despite rhetoric of ‘public engagement’, communities being kept in the dark, key stakeholders excluded from engagement activities and limited transparency related to policy making processes
Health and Safety Concerns

• Introduce new set of health and safety hazards
  – Nanoparticles more chemically reactive than larger particles
  – Nanoparticles have greater access to our bodies than larger particles
  – Greater bioavailability and greater bioactivity may introduce new toxicity risks
Environmental Concerns

- Nanomaterials bring new and unexpected forms of pollution
- Size, dissolvability and other novel characteristics enable them to readily contaminate soils, waterways and food chains
- Nano-silver: highly toxic to rat liver and brain cells; toxic to aquatic and terrestrial organisms, further increasing bacterial resistance; potential to contaminate water, interfering with beneficial bacteria, further contamination downstream on agricultural land, landfill sites etc.
- In short, negative impacts for entire ecosystems (RCEP, 2008)
- Nanoparticles can bio-accumulate: carbon nanotubes are taken up by microbial communities and root systems, concentrating up food chain (RCEP, 2008)
- TiO₂ can cause organ pathologies, respiratory distress in rainbow trout and can be toxic to algae and water flees, especially under UV light
- Nano Zinc also toxic to algae and water flees
- Nano agrochemicals more potent, possibly more toxic even though smaller quantities used.
Taking Action

- The genie is out of the bottle - we are already exposed to nanomaterials/nanoparticles etc.
- The failure of Australia’s regulatory system is in breach of citizens fundamental right to know, and is failing to protect public health and the environment
- International calls for a moratorium and a precautionary approach (Friends of the Earth, ETC Group)
- There is an urgent need for community education and democratic development of nano policy and regulations
Taking Action

• Ask for safety testing and labeling of nano products to give people informed choice
  – Nicola.RoxonMP@aph.gov.au
• Make a late submission to the ‘Review of National Food Labeling’ to support mandatory labeling
  – Mark.Butler.MP@aph.gov.au
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• Friends of the Earth Australia Nanotechnology Project
  http://nano.foe.org.au/