

## Nanobiotics and their Impact on the People of Hong Kong over the Next 50 Years

### Introduction

The purpose of this essay is to demonstrate the potential impact of nanobiotics, a new form of genetically engineered tailor-made drug which is destined to surpass antibiotics as the wonder drug of the future, on the people of Hong Kong in the near future. Antibiotics have already played an important part in improving the health of people in Hong Kong and will continue to do so but there are also possible problems emerging from the overuse of antibiotics which may have a serious impact on Hong Kong people. Nanobiotics may be the answer to those problems. This essay will begin with a brief review of the science behind nanobiotics and then show how they have the potential to improve the future lives of Hong Kong people.

### The Science Behind Nanobiotics

Antibiotics have been very successful in their bactericidal (killing microbes) or bacteriostatic (stopping bacteria from reproducing) activity. <sup>(Wong 2004)</sup> However, microbes are constantly and rapidly <sup>(Chan 2006)</sup> evolving to survive antibiotics and produce stronger strains which are more deadly. Science will never catch up with this natural evolution but the theory behind nanobiotics takes advantage of it instead of trying to fight it. This is done by producing “synthetic nano-sized organisms which, when released into the blood stream, seek out specific target microbes and infect them.” <sup>(Gripewell 2007, p28)</sup> The nanobiotics cause the microbes to mutate in predictable ways which can be <sup>(Jones 2007)</sup> controlled and render them harmless. The scientific beauty of this approach is that unlike

NOTE: Better to paraphrase this section (but still include the acknowledgement)

proponents of antibiotics who are constantly struggling to adjust their drugs to become

“stronger chemical agents capable of killing increasingly resistant microbes,” the creators of (Wong 2004, p10)

nanobiotics simply need to programme theirs to recognise a target microbe from a DNA

sequence. In theory, at least, very little further adjustment will be needed. (Gripewell 2007)

Nanobiotics are currently in the developmental stage and have not yet been subjected to field

(Jones 2007)  
tests. Such testing would be necessary before the drugs could be used on humans. However,

“laboratory tests indicate some success.” (Gripewell 2007, p28)

## **The Impact of Nanobiotics on Hong Kong in the Future**

Like many other parts of the world, Hong Kong has benefited from the development of

antibiotics but just like those places it will also suffer from the development of antibiotic

(Chan 2006) resistance. Even though “Hong Kong has a highly developed and modern health care system” (Wong 2004, p10)

it seems likely that stronger strains of deadly microbes will eventually cause problems. This will

be particularly difficult in a place with such a high population density. In the future, nanobiotics

may become a crucial tool in maintaining the health of the population. There are a number of

ways in which the health impact of nanobiotics on the people of Hong Kong may manifest.

These relate to a reduction on the dependence on antibiotics and the associated drug

resistance this entails; a reduction in the cost of health care; and a decrease of the pressure on

Hong Kong health professionals.

The “large number of medical conditions which are currently treated in Hong Kong with antibiotics” (Wong 2004, p10) could also potentially be treated with nanobiotics when they have been developed.

These conditions include those relating to hospital surgical procedures like the infection of surgical incision sites, or secondary infections associated with intensive care patients; and (Wong 2004) medical conditions treated by General Practice doctors like fungal infections on the body.

There are also suggestions that antibiotics are procured from unofficial sources and taken (Chan 2006) without medical advice. Even these could eventually be replaced with nanobiotics.

The big advantage of nanobiotics for Hong Kong people is that there would be very “specific (Gripewell 2007, p 28) drugs which target exactly particular illnesses.” (Jones 2007) These drugs would be cheap and more readily available. These characteristics would encourage Hong Kong people to make use of nanobiotics in place of antibiotics. The big advantage of this change would be a huge reduction in the use of antibiotics which would result in a slowing down of the antibiotic resistance which (Chan 2006) is currently worrying many medical scientists.

“Nanobiotics will eventually be much cheaper than antibiotics because there is far less need for constant updating to cope with microbe mutation. As a result, once the developmental cost of nanobiotics has been recovered, their production costs will decrease dramatically.” (Jones 2007) Cheaper

but more effective drugs is the real promise of nanobiotics.

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A third result of the use of nanobiotics in the future is that the current “pressure on Hong Kong’s health care professionals” (Wong 2004, p10) might be reduced. As nanobiotics become available for common and minor illnesses it should be possible for people to take care of their own health without bothering doctors. This would free the medical community to devote their energies to the more seriously sick and those whose illnesses cannot be treated with nanobiotics.

## **Conclusion**

It is clear that the science of nanobiotics is a dream at this moment. However, there is a good theoretical basis for believing that they will be developed in the future. At that time, and certainly within the next 50 years, nanobiotics will have an enormous impact on the lives of Hong Kong people. These new drugs will reduce dependence on antibiotics thus reducing drug resistant strains and so decreasing the potential for life threatening microbes to sweep through the crowded population of Hong Kong. Nanobiotics also have the potential to provide much cheaper health care and to relieve some of the pressure from the Hong Kong health care professionals.

## **References**

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