

Looking Backward to Look Forward: Sustaining Oviedo Convention achievements in the Era of Genetic Engineering & Nanotechnologies Prepared for the Conference THE OVIEDO CONVENTION ON HUMAN RIGHTS & "20 YEARS AFTER: **BIOMEDICINE**". University of Aristotle Greece 2017

# **GLOBAL HEALTH MPACT OF** NANOTECHNOLOGY A Tool for Stakeholder Engagement

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Is it possible that a general topic such as Nanotechnology cannot possibly be directly related to the Convention..?



### scientific realities, not envisioned at the time of its writing turn bioethics upside down:

Frozen eggs and remarkably accurate in vitro harvesting impact choices and decisions about human reproduction, including the spectrum of embryos that will be considered viable for new parents to raise.

Nanotechnology plays a major role in this sweeping social change, new uses of human stem cells from oneself and ultimately new definitions of key legal **terms**.

Nanotechnology and nano-enabled for synthetic organs, grown from the patient's own stem cells.

#### IMPACT ON HUMAN TRAFFIKING OF ORGANS?

once the price of grow-your-own organs becomes commercially marketable, with(out?) attention to bioethical concerns about prolonging life





Mercedes-Benz Mercedes CLS-class



Wilson Double Core tennis balls





3M Adper Single Bond Plus dental adhesive



Wyeth Rapamune immuno-suppressant

Wyeth®





#### **Smith&nephew**

Smith & Nephew Acticoat 7 antimicrobial wound dressing

Kodak

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Kodak EasyShare

LS633 camera



Laufen Gallery washbasin with Wondergliss



NanoOpto subwavelength polarizing beam splitter/combiner



SAMSUNG



Hummer H2

Samsung Nano

SilverSeal Refrigerator

### Context of nanotechnology research





#### **Public Health**



#### Emerging Technology



Human Rights Law

#### Nanotechnology is a new tool for genetics.

Manipulating particles at the nanoscale is smaller than D N A. Nanotechnology and nanoenabled devices are now used in genetic engineering, gene therapies Nanotechnology can alter nanoparticles within DNA and RNA which is a subset of a subset at the chromosomal level. We can change or create new proteins by altering their DNA and even change the protein corona that surrounds a cell.

people may be able to use their own stem cells to create eggs or sperm, and thus have only one parent for a newborn child, of their choosing if not design, with their genetic imprint plus a few alterations via gene therapies or fetal surgery in an artificial womb.



# Working assumpton

Nanotechnology's revolution for commerce will revolutionize public health



civil society has before us the multibillion dollar question...

Are these changes ok Or In violation of the convention

Or not covered by it at all?

article 13:

An intervention seeking to modify the human genome may only be undertaken for preventive, diagnostic or therapeutic purposes and only if its aim is not to introduce any modification in the genome of any descendants.

nanotechnology, is important for ongoing genetic testing,

gene editing and

the development of replacement organs from an individual's own stem cells, other personalized medicine.

Therefore it is unclear whether Convention will apply or place limits on genetic tinkering made possible using nanotechnology.

Whether application of nanotechnologies considered "an introduction of modifications in the genome" or could it be argued that it is excluded from the provision of the Convention?

Can scientific progress can circumvent the constraints of the provision?



"and only if its aim is not to introduce any modification in the genome of any descendants".

Nanotechnology can alter nanoparticles within DNA and RNA which is a subset of a subset at the chromosomal level. We can change or create new proteins by altering their DNA and even change the protein corona that surrounds a cell..

We like that when it is a targeted drug delivery assaulting a cancer cell But perhaps some other types of manipulation run afoul of the convention?



## Nanomedicine

social transformations will redefine key social constructs SOCIETY WILL CHANGE WITH THESE Health --medicine-- public health CHANGES The meaning of the terms « health » As defined under law these terms will change because there will be new treatments, earlier detection, presymptomactic NOT COVERED BY EXISTING LAW

When the Convention was written scientists were still mapping the human genome and bioethicists were worried about what society would do with information revealed at the chromosomal level And if they are ok under the convention's plain meaning but violate its principles Or not covered by plain meaning and violate its principles what shall we do? Amend.. Ignore... Write a different convention??

think very carefully for the next few years... but

The short answer is that the impact of nanotechnologies on the scope and vibrant application of the Convention will depend very much on context

## Forethought Beats Afterthought...

Do some types of manipulation run afoul of the convention?

Or perhaps involve something not clearly covered by the Convention at all?

## Translating Good Science Into Good Law (not bad policy!) THREE APPROACHES

- 1. Do nothing because nanotechnology is not novel
- 2. Modify existing laws
- 3. Write new laws

If we anticipate these issues we can effectively address them without writing new law.

ADAPTING INTERPRETATIONS TO EMBRACE NANOTECHNOLOGIES MAY MAKE ITS PRINCIPLES APPLICABLE TO THE NEXT GENERATION.

## Conclusion





# **GLOBAL HEALTH IMPACT OF** NANOTECHNOLOGY A Tool for Stakeholder Engagement



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Thank you!!!

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