Title: Balancing nanotoxicity and returns in health applications: The Prisoner's Dilemma

Authors: D.A. Gkika, L. Magafas, P. Cool, J. Braet

PII: S0300-483X(17)30338-4
DOI: https://doi.org/10.1016/j.tox.2017.11.008
Reference: TOX 51976

To appear in: *Toxicology*

Received date: 21-9-2017
Revised date: 4-11-2017
Accepted date: 6-11-2017

Please cite this article as: Gkika, D.A., Magafas, L., Cool, P., Braet, J., Balancing nanotoxicity and returns in health applications: The Prisoner's Dilemma.Toxicology https://doi.org/10.1016/j.tox.2017.11.008

Balancing nanotoxicity and returns in health applications: The Prisoner's Dilemma

D. A. Gkika[1, 2]*, L. Magafas[3], P. Cool[4], J. Braet[1]

[1]University of Antwerp, Applied Economics, Department of Engineering Management, Antwerp, Belgium

[2]Eastern Macedonia & Thrace Institute of Technology, Hephaestus Advanced Laboratory, Kavala, Greece

[3]Eastern Macedonia & Thrace Institute of Technology, Electrical Engineering Department, Kavala, Greece

[4]University of Antwerp, Department of Chemistry, Antwerp, Belgium

***Corresponding Author**

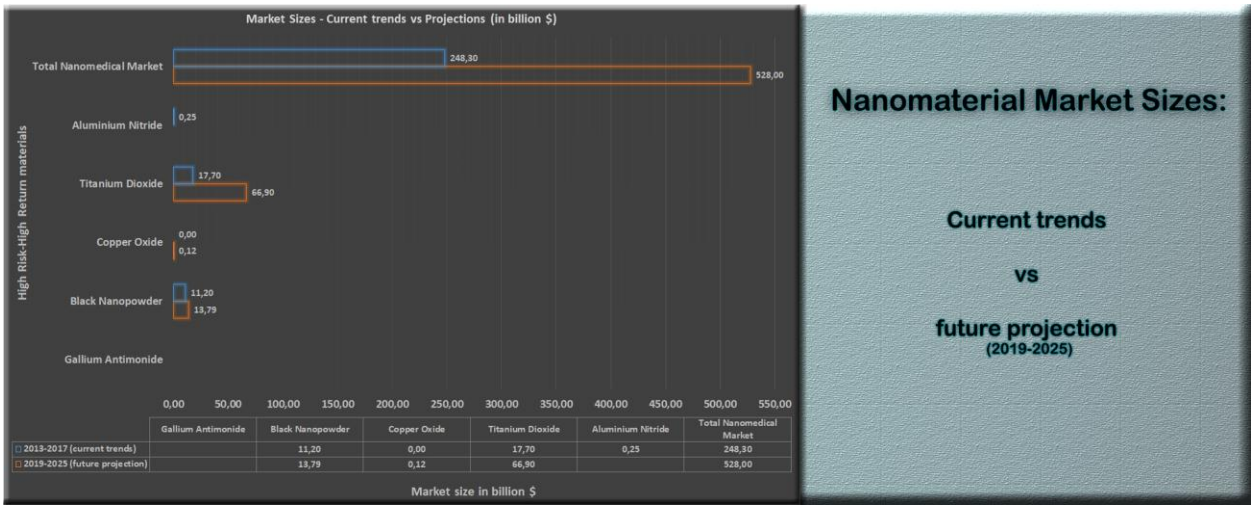
D. A. Gkika

A: Prinsstraat 13, 2000, Antwerp, Belgium

T: 0030 6973568531

E:despinagkika@gmail.com

Graphical abstract



Abstract

Over the past 30 years, there have been significant advancements in the field of nanomaterials. The possibility to use them in applications such as cancer treatment is extremely promising; however, the toxicity of many nanomaterials as well as the high costs associated with their use is still a concern. This paper aims to study the connection between nanomaterial toxicity and cost. This synergy may be interpreted as a different version of the classic "Prisoner's Dilemma" game, which in this case attempts to explain the possible outcomes of cooperation versus conflict between science advocating for the use of high-risk, possibly toxic materials due to their high returns, and society that might be dubious about the use of high-