

UK Nanomedicine Market, Current Status and Future Prospects

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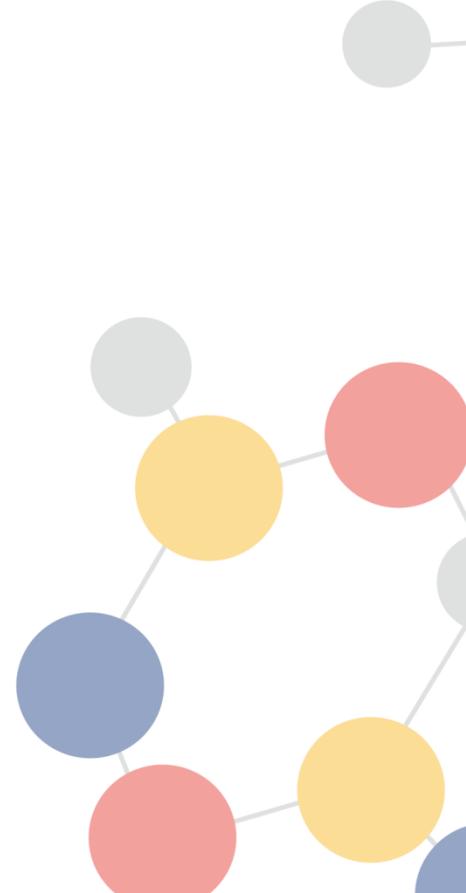
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Overview

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Nanomedicine Defined

- Nanomedicine is defined as a material which uses nano-sized tools (or devices) for the diagnosis, prevention and treatment of disease and to gain an increased understanding of the complex and underlying patho-physiology of disease.



Global Nanomedicine Market-sizes

- Market for nanomedicine was valued at US\$ 78.54 billion in 2012¹
- Expected US\$ 177.60 billion in 2019; compound annual growth rate of 12.3% from 2013 to 2019¹
- Anticancer nanomed products market reached US\$ 5.5 billion in 2011¹
- 2012: global nanomed market was dominated by oncology - market share 38.0%²
- 2021: global nanomed market predicted valued at US\$ 1 Trillion³
- Nanotechnology-enabled drug delivery market valued at US\$ 136 billion, taking 15% of the overall global nanomedicines market³
- In last decade: Nanotechnology applied to medical imaging and gold nanoparticles for diagnosis were highest growth during the last decade⁴
- 2011: medical imaging valued at US\$1.7 billion and gold nanoparticles at \$ 959 million⁴
- 2021: the nanotech-enabled diagnostics market estimated to reach US\$53.6 billion⁴

1. Nanomedicine Market (Neurology, Cardiovascular, Anti-inflammatory, Anti-infective, and Oncology Applications) - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2013 – 2019, Transparency Market Research (2014)

2. Nanotechnology in Medical Applications: The Global Market, BCC Research (2012)

3. Nanotechnology in Drug Delivery: Global Markets, Cientifica, (2012)

4. Nanotechnology for Medical Diagnostics, Cientifica, (2012)

Nanotechnology Innovation in Healthcare and Medicines in the UK

- The UK life sciences industry has been one of the most successful worldwide, over the past 40 years. Stems from the UK's world leading research base, proven expertise in life science discovery
- UK Research in Nanomedicine – funding support:
 - 74 active research projects funded by the UK research councils that involve nanotechnology as applied to the healthcare and life sciences field. The cumulative total for the value of these awards being £72,387,064
 - Largest award was granted to the EPSRC IRC in Early-Warning Sensing Systems for Infectious Diseases at £11,057,900
 - Through European funding programmes, UK has participated in a third of the projects involving nanomedicines
 - 219 undergraduate and foundation courses that have a nanoscience focus, offered by 61 institutions in the UK
 - World leading academics working in the UK

Biomedical Catalyst Funding

- After 3 rounds of calls, £112.1 million invested in 109 projects in the three award categories:
 - Feasibility/Confidence in Concept Award
 - Early Stage Award
 - Late Stage Award
- Of these, nanomedicine companies and projects have received just over £9 million of investment
 - 8% of the total value of awards granted

Nanotechnology Innovation in Healthcare and Medicines in the UK

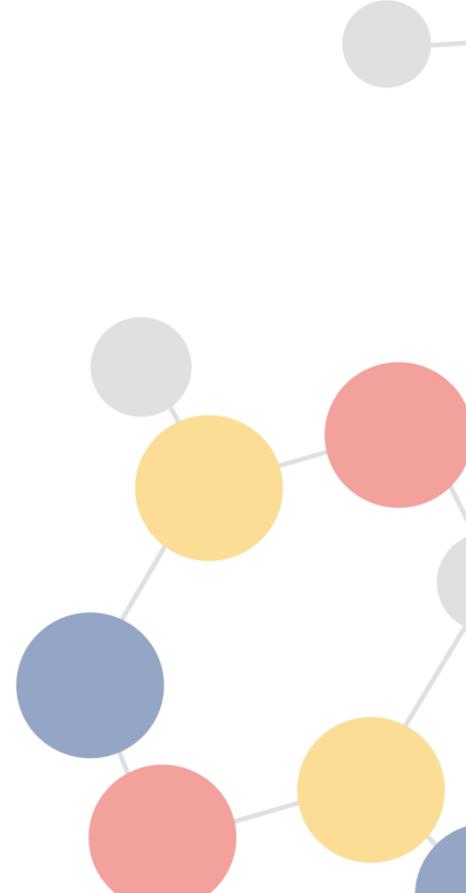
- UK Government policy advisory group Nanotechnology Strategy Forum
 - In March 2014, much discussion about Nano in Healthcare & Medicines
 - Recommendations were made
- UK Government's Life Science Strategy 2011
 - Life sciences - key contributor to UK sustained economic growth
 - Intention to support cross cutting programmes in this field, namely emerging technologies, e.g. synthetic biology, bioinformatics, regenerative medicine, and stratified medicine
 - Establishment of the Cell Therapy Catapult Stratified Medicine Innovation Platform and Biomedical Catalyst fund all of which link into nanomedicine

Nanomedicine Initiatives in the UK

- NanoKTN – Healthcare and Life Sciences Theme
- Nanotechnology Industries Association - Medical Devices & Pharmaceuticals Focus
- British Society for Nanomedicine launched in 2012
- Academy of Pharmaceutical Science – Nanomedicine Focus Group launched 2014
- Royal Society of Chemistry – Nanomedicine discussion Group
- NanoFutures, Guardian Newspaper, part of the EU Nanopinion initiative

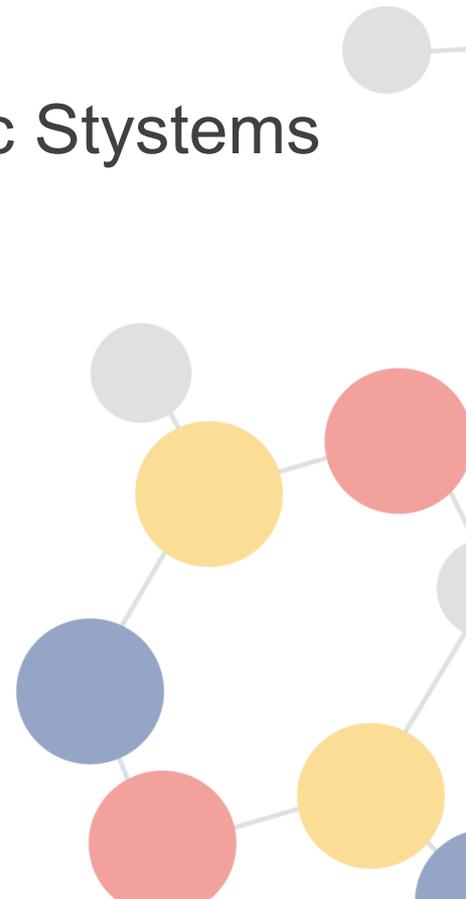
Nanotechnology in the Pharmaceutical Industry

- UK based Companies include:
 - SMEs
 - Lena Nanoceutics
 - Molecular Profiles
 - Nanomerics
 - Global Pharma
 - GSK
 - Astra Zeneca
 - Amgen
 - Pfizer
 - Teva Pharmaceuticals



Nanotechnology in Medical Devices

- **Diagnostics, monitoring and prevention**
 - Nanobiosensors
 - Point of Care Diagnostics
 - Nanoelectromechanical & Bioelectronic Systems
 - Metallic Nanoparticles
- **UK SMEs include:**
 - Applied Nanodetectors
 - Endomagnetics
 - Oxford Nanopore
 - QuantuMDx Group

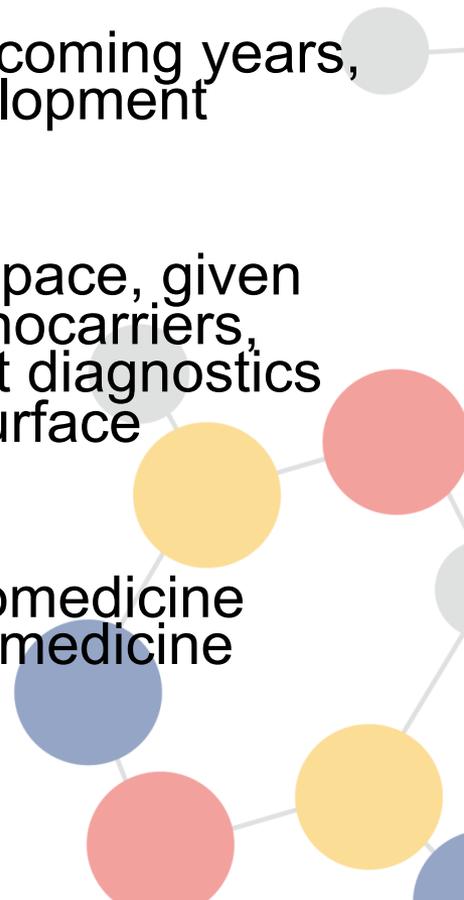


Nanotechnology in Regenerative Medicine

- **Materials for advanced wound dressing**
 - Woven dressings & Hydrogels
 - Silver & Gold Nanoparticles
- **UK SMEs working in Regenerative Medicine include:**
 - The Electrospinning Company
 - SpheriTech
 - Orthox Ltd



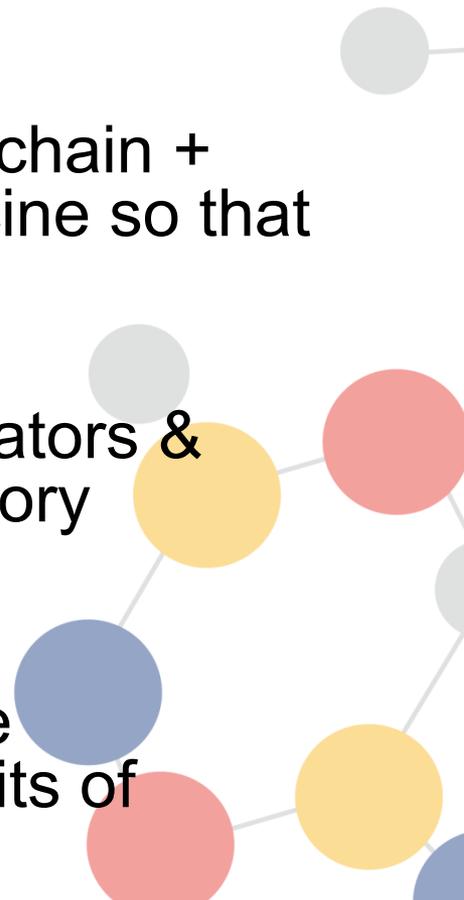
Future Prospects

- Application of nanotechnologies to the Life Science and Healthcare field has seen significant growth and this will accelerate
 - Nanomedicines are already in clinical use; in the coming years, ever increasing number coming through the development pipelines
 - Much excitement amongst those working in this space, given the near limitless possibilities of strategies for nanocarriers, development of more sophisticated and intelligent diagnostics and construction of nanomaterials with defined surface morphologies
 - Development of Nanosimiliars – “follow-on” nanomedicine products that arise as the first generation of nanomedicine products come off patent
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Summary

- UK has very strong fundamental science base in nanotechnology; internationally renowned academic and commercial research laboratories; a world leader in healthcare - experience and expertise in meeting the healthcare demands of diverse populations
- Nanomedicine is already starting to realise its potential in clinical practice and many more products are currently in preclinical and clinical development
- The global market for nanomedicine was valued at US\$ 78.54 billion in 2012 and is expected to reach a value of US\$ 177.60 billion in 2019
- The UK Government is keen to have its Life Science sector remain internationally recognised and so to support UK technological developments: introduced a number of funding initiatives and key target areas for therapeutic development
- Education and training programmes increasing in this area across the UK
- The UK is poised to take advantage of the massive potential that is embedded in its nanomedicine companies and academic research groups, which would culminate in significant financial gains and more importantly positively impact global human health and well-being

Recommendations for the UK

- Continue to coordinate the translation of nanomedicine efforts across academic, industrial and clinical organisations
 - Links with other organisations
 - Continue to develop the commercial supply chain + public & private investments into nanomedicine so that its full market potential can be realised
 - Encourage an open dialogue between regulators & nanomedicine developers to support regulatory evaluations
 - Engage with other UK groups to improve the understanding of the applications and benefits of nanomedicines to society
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Acknowledgements:



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Thank You for your attention

