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Short Communication

Nano Medicine Market: The Inestimable Boon to Horizon 20-20

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Over the past many years, research studies in the Healthcare industry have changed significantly. There has been a paradigm shift from the extremely popular drugs (blockbuster drugs) to a more personalized medicine approach. This emergence of personalized medicine witnessed a raise in the global Nano medicine market and likely expected to reach a value of USD 177.60 Billion by 2020 and expected to grow rapidly to the level of influencing the economy of entire globe.

Driving forces

Nano medicine is partly technology push and partly demand driven. One of the main factors driving the market is the emergence of Nano robotics, which at present is in its initial stage and metamorphoses into a potential stage, where a situation arises that there would be a seldom treatment without Nano robotics. The Global Nano medicine market is witnessing a significant demand for personalized medicines because of their ability to provide customized treatments to patients. Major driving factors consist a rising base of geriatric population, the presence of high unmet medical needs and the rising worldwide incidences of chronic diseases.

Challenges

Despite the exciting advancements in this discipline, the field of Nano medicine has yet to be exploited to its full potential, moreover the long approval process and stringent regulations of FDA and other regulatory agencies flags the tremendous increase of its global market. Since the expenditure to establish any Nano medicine product in the consumer market is enormous and hard to afford.

Global market

The market for Nano medicine was evaluated at USD 78.54 billion in 2012 and expected to reach a value of USD 177.60 billion in 2020, growing at a CAGR (compound Annual Growth) of 12.3% from 2013 to 2020.

Nano medicine sector

More than a decade commercialization in Nano Medicine market and of its products greatly increased. There are about 200 companies carrying Nano Medicine activities in which 92(44%) are start-ups, 67(32%) are Small & Medium Enterprises (SME's) and 41(24%) are larger Pharmaceutical companies. The start-ups and SME's focus completely or to a greater extent (about 87) on Nano Medicine. The larger companies have their own individual Nano Technology based products and their research segments.

Geographical segmentation

The USA is leading with regards to patent applications with a share of 53%, followed by the EU25 with 25% and Asia with 12%. Although the SME's and Start-ups are the same for USA and the European countries (EU25) 46% of all the Nano medicine products are developed by US compared to 37% by EU25. Within the EU25 Germany, UK and France are leading with regards to commercialization efforts. North America dominated the market in 2012 and is expected to maintain its market position till 2020. However the Asia-Pacific market is expected to grow at a faster pace (CAGR of 14.6% from 2013 to 2020). Europe is more like to grow at a higher rate compared to other similar markets owing to constantly improving regulatory framework and the presence of an extensive product pipeline portfolio.

Key vendor analysis

The prominent vendors that occupy the major space include Abbott Laboratories, AstraZeneca plc, Bristol-Myers Squibb Co., Celgene Corp., GlaxoSmithKline plc, and Pfizer Inc. The other competitors fighting for a space include Ablynx NV, Acusphere Inc., Aphios Corp., Arrowhead Research Corp., BioForce, Nano sciences Holdings Inc., Bio-Gate AG, Biophan Technologies Inc., BioSante Pharmaceuticals

Challenges for commercialization

As of present scenario there are no general scientific hurdles that cease the entry of the Nano medicine products into the market.

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However there are some stumbling blocks for commercialization that arise from external factors, such as availability of capital, technology transfer management, the intellectual property landscape, and the regulatory issues.

Table 1: Applications of nanomedicine.

Technology	Application
Nano pharmaceuticals– in current use or entering routine usein the short-term future within 5 years)	Cancer, Antiviral agents, Arteriosclerosis, Chronic lung diseases, diabetes,
Nano pharmaceuticals- with potential clinical applications in the longer term future(10) years	Gene Therapy, tissue engineering, Tissue/Cell repair
Nano devices	Delivery of diagnostic and therapeutic agents

Table 2: Pharmaceutical companies, drugs and their therapeutic areas.

Healthcare application	Composition/nanotech component	Indication	Company
Amphotec	Amphotericin B/lipid colloidal dispersion	Fungal infections	InterMune (Brisbane, CA, USA)
DaunoXome	Liposomal daunorubicin	Kaposi sarcoma	Gilead
Depocyt	Liposomal cytarabine	Cancer	SkyePharma (London), Enzon
EpaxalBerna	Virosomal hepatitis vaccine	Hepatitis A	Berna Biotech (Bern, Switzerland)
Myocet	Liposomal doxorubicin	Breast cancer	ZeneusPharma (Oxford, UK)
Triglidec	Nanocrystallinefenofibrate	Lipid regulation	SkyePharma, First Horizon Pharmaceuticals (Alpharetta, GA, USA)
Abraxane	Paclitaxel protein bound nanoparticles	Cancer	AbraxisBioScience (Schaumburg, IL, USA), AstraZeneca (London)
In vivo imaging			
Resovist	Iron nanoparticles	Liver tumors	Schering (Berlin)
Gastromark/Lumirem	Iron nanoparticles	Imaging of abdominal structures	Advanced Magnetics, Guerbet

Nano medicine classification and their market trends

When classified according to therapeutic domains identified as a burden for most of the population the following areas are more prone to commercialized

- Cardiovascular and respiratory diseases
- Cancer
- Allergic, immunological and infectious diseases
- Neurodegenerative diseases including neurosciences and mental health
- Diabetes, digestive and renal diseases
- Rheumatic diseases, musculoskeletal disorders and skin diseases

The market for central nervous system products was valued at $11.7 in the year 2010 and $14 billion in 2011. It is anticipated $40 by 2020. The market for anti-cancer products was valued at $25.2 in the year 2010 and $28 billion in 2011. It is anticipated $62.3 by 2020.Within Nano biotechnology the prime interest of the investors was drug discovery accounting for 54% of the investments followed by diagnostics (37%), drug delivery (5%) and biopharmaceuticals (4%).

The applications of Nano medicine in the coming decade of different areas are listed as in Table 1 and Table 2 respectively. Some of the Nano medicine products in the market, the ingredient (API), the therapeutic usage (disease) and the company (includes all the Start-ups, SMEs and major pharmaceutical enterprises) by which it is manufactured is tabled below.

CONCLUSION

In recent years Nano medicine has emerged as one of the most prominent application fields of nanotechnology, although publication-wise it currently accounts only for 5% of nanotechnology publications worldwide. It still is at an early stage development with few products on the market. Also the large share of start-up companies and SMEs (80%) within the companies worldwide that openly develop Nano medicine products reflects the early development stage of Nano medicine. However, not all large pharmaceutical and medical device companies make their engagement in Nano medicine R&D public. These Nano medicine products could bring a revolution in the Health care industry and undoubtedly gives a promising future to the emerging pharmaceutical market.