

Nanomedicine Comes of Age

NanoEquity Europe 2006
Frankfurt

Dr. Volker Wagner



Nanomedicine Publications and Patents

Nanomedicine Nears the Clinic

Minuscule “smart bombs” that find cancer cells, kill them with the help of lasers and report the kills. Sound crazy? Guess again. That treatment scenario may be less than a decade away. BY DAVID VOSS

Nanomedicine Initiatives

in Cancer - Microsoft Internet
en Extras ?
Suchen Favori

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NCI Allianc
Nanotech
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▼ About

Nanotech High

Monthly Feature
[Mission to the In](#)
May 2006

[NSTI - Nanotech](#)
Boston, MA
May 7-11, 2006

[Training Fellowsh](#)
NIH/NIST Joint Po
Deadline: August

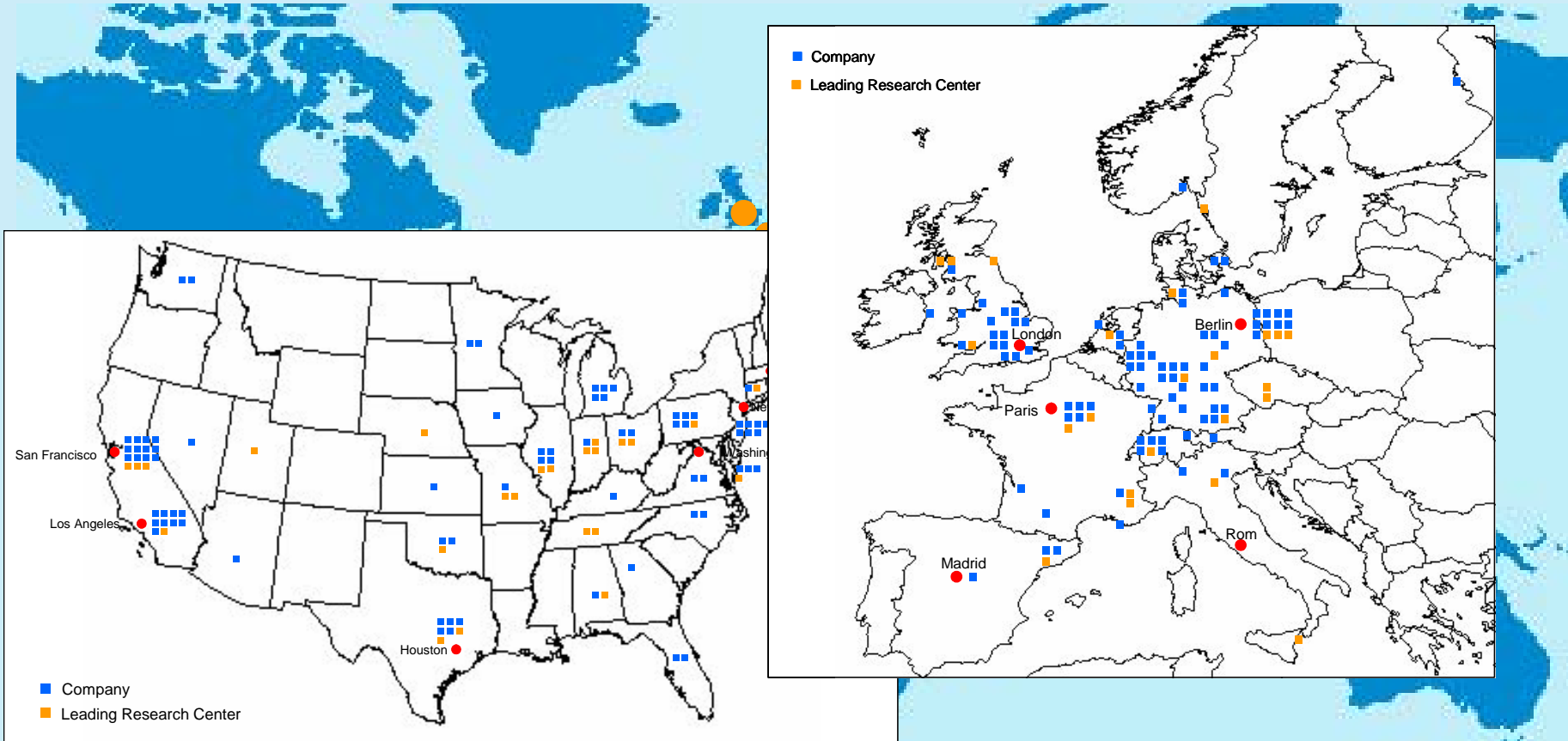
[NCI Listens & Leans](#)
NCI requests feedback from the

PROJEKTRÄGER FÜR DAS
Bundesministerium
für Bildung
und Forschung

Netzwerk
der
Projektträger

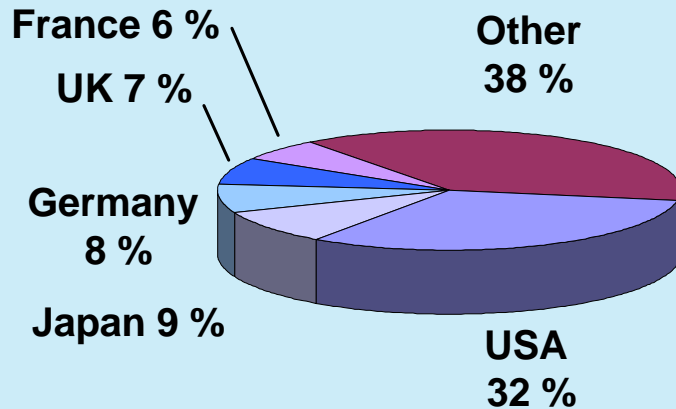
Agenda
September 2005

Nanomedicine Cluster

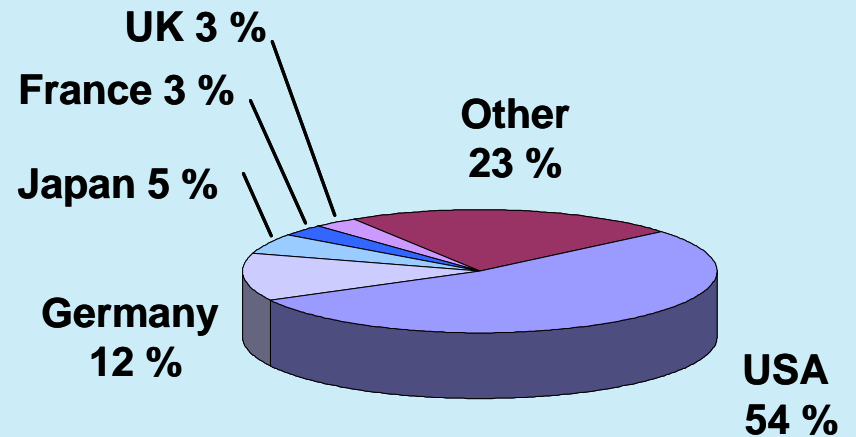


Country Breakdown

Publications

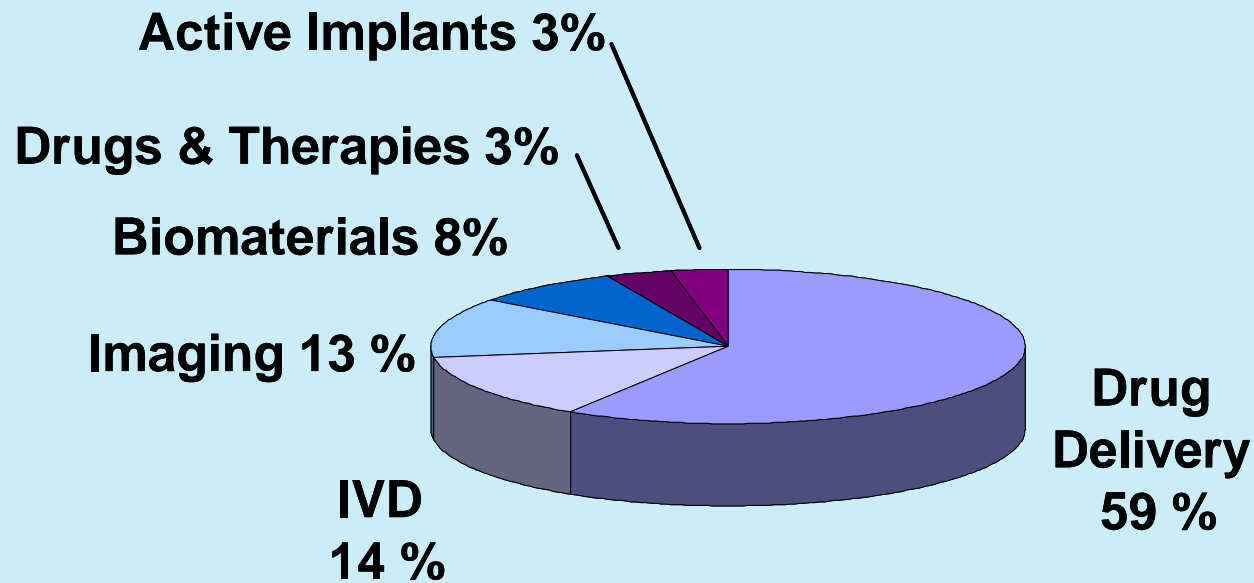


Patents



Source: VDI Technologiezentrum, Düsseldorf
European Patent Office, Den Haag

Sectorial Breakdown of Nanomedicine Patents



Source: VDI Technologiezentrum, Düsseldorf

Nanomedicine Market 2004

	Products	Market Billion US\$	Product Pipeline	Companies
Drug Delivery	21	5.4	98	113
Biomaterials	8	0.07	9	32
In vivo Imaging	3	0.02	8	15
In vitro Diagnostics	2	0.78	30	35
Active Implants	1	0.65	5	6
Drugs & Therapy	0	0	7	7
Total	35	6.9	157	208

Products on the Market

Drug Delivery

DOXIL
(doxorubicin HCl liposome injection)

AmBisome
liposomal amphotericin B

Visudyne
verteporfin

sirolimus
Rapamune

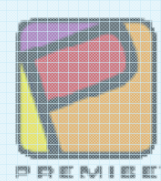
EMEND
(aprepitant)

NON-INTERFERON
COPAXONE
(glatiramer acetate injection)

Neulasta
(pegfilgrastim)

Dental Restoratives

Filtek™



Tetric Evo Ceram
Nano-optimised mouldable ceramic

ceram•x
DENTAL CERAMIC RESTORATIVE

Diagnostics

Trinity

Uni-Gold
hCG

Resovist

Biomaterials

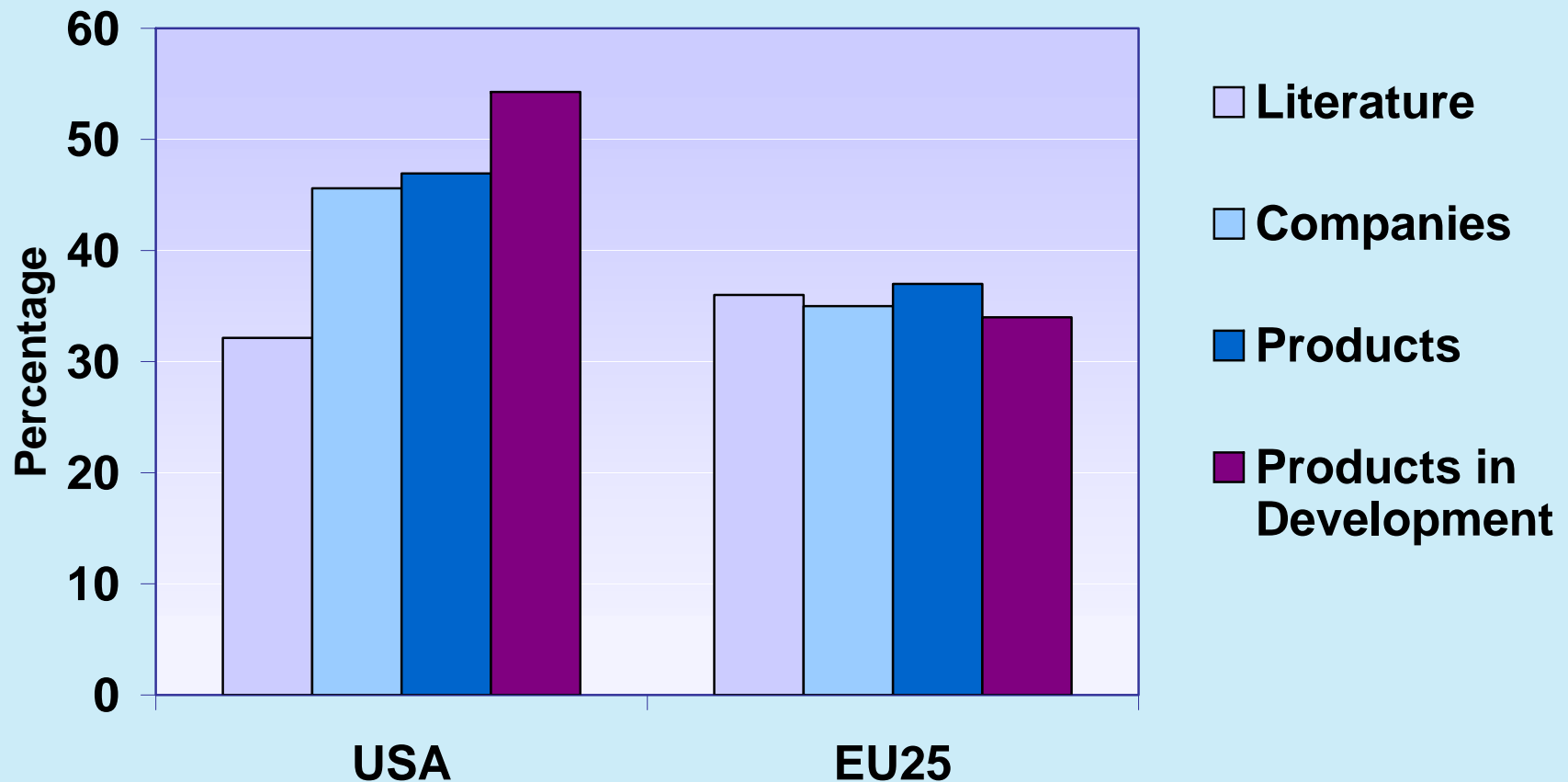


VITOSS
synthetic cancellous bone

PerOssal

Acticoat

Nanomedicine - Comparison of EU25 and USA



Drivers of Innovation – Technology Perspective

Nanotechnology provides materials with unique properties that addresses important medical needs:

- Passive and active targeting
- Crossing of biological barriers
- Cheap and highly sensitive sensors concepts for DNA, proteins and pathogens
- Stimulating self-healing cell responses

Hurdles for Innovation

- Intrinsic complexity of Nano-Bio-Interface
- Still little investment by big pharma and medical device companies
- Regulatory framework unclear

Conclusions

- Publication and patent activity strongly increasing
- Market of about \$ 7 billion that is expected to double until 2012
- Interest of big pharma is still cautious
- Diversity of applications and unique properties of nanomaterials make Nanomedicine likely to become one of the fundamentals of medical innovation in this century