

Immunotherapy, a Future for Vaccines ?

Jean-Paul PRIEELS
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■ **Over 20b€ in 2011**

- 3% of total Pharma sales,
- Same value as Lipitor, Plavix and Nexium combined US sales
- But over 3 million lives saved each year

■ **5 major players :**

- GSK, Sanofi, Merck, Pfizer and Novartis

■ **A few new global entrants :**

- J&J, Takeda, Astellas

■ **A number of regional & national producers**

- India, China, Brazil, Japan, Thailand, South Africa, Vietnam...

■ Market Segmentation

■ *Paediatric*

-S pneumonia, MMR-V, DTPa combos, Meningitis combos, Flu, Rotavirus

■ *Adolescents*

-HPV, DTPa boosts, Meningitis combos

■ *Adults & Elderly*

-HPV, Flu, S pneumoniae, Zoster

■ *Travellers*

-HBV, HAV, Salmonella ...

Within the next 3 years:

- Flu and DTPa combos line extensions, Malaria, Zoster

Within 3 to 6 years:

- Dengue, MenB, HPV line extension, C Difficile

And after ?

- RSV, TB, HCV, Norovirus...

■ WHO WW annual mortality rates :

- 4M children under 5Y die from infectious diseases
 - 1,2M pneumonia
 - 0,76M diarrhoea
 - 0,5M Malaria
- 36M deaths due to non communicable, chronic diseases (29M in low and middle income countries)
 - 7,6M cancer
 - 4,2M respiratory diseases including asthma and COPD
 - 1,3M diabetes

- Whole Genome Sequencing and SNP identification, Microarrays, Theranostics and Biomarkers
- Adjuvants, DNA delivery vectors, mRNA and immune response modulation
- Stem Cells and Cell Therapy

■ **Cancer Immunotherapy :**

- Vast Majority of projects handled by Small Biotech Companies
- Over 1,000 projects in preclinical and early clinical development
- One product approved in US: Provenge, (Dendreon)

■ **A few Phase III programs ongoing :**

- Major results expected in the next 2 years that will impact the whole field.
- GSK: MAGE-3 lung and melanoma
- Merck KGaA: Stimuvax lung

Therapeutic vaccines against infectious diseases

- A series of failures: HSV, HBV, HPV, HIV and a large numbers of trials ongoing,
- One postinfection vaccine approved: Zoster

A number of avenues still to explore or validate

- COPD and bacterial /viral exacerbations,
- CMV and hypertension, Atherosclerosis
- EBV and MS
- Chlamydia pneumoniae and Alzheimer

Autoimmune Diseases

- Vast Majority of projects handled by Small Biotech Companies
- Over 300 projects in preclinical and clinical development
 - Alzheimer
 - Diabetes
 - MS
 - Crohn disease
 - Coeliac Disease

- **A few opportunities left for classical prophylactic vaccines approaches :**
 - RSV, Dengue, MenB
- **Niche markets for specific target populations**
 - C Difficile and other nosocomial diseases
- **Alternative avenues :**
 - From infectious diseases to non infectious chronic disorders
 - Therapeutic vaccines for established infections
 - Cancer active immunotherapy
- **Such approaches will require and benefit for newly developed platform technologies**

***The future belongs to those who see possibilities
before they become obvious***

***People who take risks are the people you'll lose
against***

J. Sculley