Mountains of Knowledge and Dearth of Innovation

What to Do?

Bernard Munos
Founder
InnoThink Center For Research in Biomedical Innovation
Indianapolis, April 12, 2013
Mountains of knowledge

- Pubmed publications: +5.9% / year
  almost 3000 / day

- Cost of sequencing genome: -66% / year
  about $6,500

- No of species sequenced: +38% / year
  about 4,325

Source: pubmed
Source: genomesonline.org
Source: genome.gov
Dearth of innovation

Flat trend for both patents and applications

Flat trend for new drugs approved

Source: FDA
Conclusion

The engine that converts cutting-edge knowledge into commercial products (the pharma business model) no longer works well

Two main reasons:

- Pharma companies are no longer focused on cutting-edge science
- Pharma companies are no longer efficient at translating science into products
What to do?
The drivers of innovation

- Breakthrough science
- Audacious thinking
- Cross-pollination
- **NOT** discipline, alignment, money, organization, etc.

Innovation culture

Process culture
The Industry Response
Reinventing R&D

• Return to **unfettered breakthrough science** (Novartis, AstraZeneca?)

• **Personalized medicine** integrated with genomics and diagnostics (Roche)

• Biotech-like **Discovery Performance Units** (GSK)

• Repositioning of the company on **less IP-sensitive areas** (Sanofi)
Trial and error

• Myriad R&D collaborative schemes (everyone)

• Restructuring (Abbvie)

• “String-of-pearls” (Bristol-Myers Squibb)

• Open-innovation initiatives (J&J)
Doubling-down on process

- Six sigma, portfolio management, market-driven R&D (Lilly, AstraZeneca-pre-Soriot, Merck-pre-Perlmutter)
Will it work?
Pharma’s **triple** challenge

- **More innovation**  
  Big pharma is tackling this
- **Better innovation**  
- **Affordable innovation**  
  It is not addressing this

The industry will **fail** if it does not make its drugs affordable
Affordability requires more than clever R&D

Two main approaches:

- **Hyper**-innovation (GSK)
- **Radical** new models (virtual portfolios, micropharmas, repurposing, etc)
Prerequisites

• Elimination of knowledge gaps (to make biology more predictive)

• Return to a true culture of innovation
Conclusions

• The face of pharmaceutical innovation is changing

• Most companies are reversing the mistakes that have precipitated the innovation crisis

• Several key challenges remain:
  - Knowledge integration
  - Affordability
  - Fostering a true innovation culture
Thank you!

Questions?
(bhmunos@stanfordalumni.org)