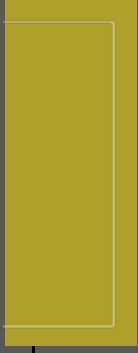


Drug Discovery

Steve Bloom

Imperial's mission

Imperial College delivers education and research in science, engineering, medicine and business, with particular regard to their application in industry, commerce and healthcare.



The idea



*DIAGNOSTICS,
DRUGS, EQUIPMENT,
SOFTWARE*

Focusing on Drug Discovery

Universities rarely to set out to discover a drug



Practicalities

Drug Idea

*What is
“enabling”?*

*What are
Intellectual
Property Rights
(IPR)*

*Why and how to
patent*

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patent*

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*Why and how to
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*Why and how to
patent*

*Patenting costs
money*



What next?

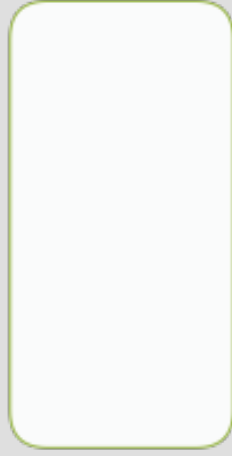
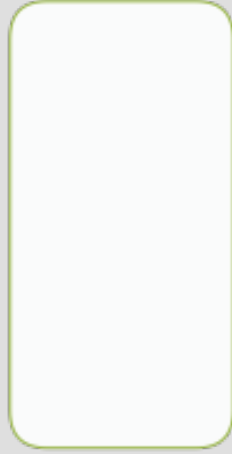
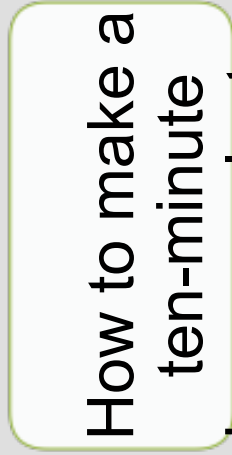
Personal example:

- Found a hormone in human gut - release insulin after meals and reduced appetite.
- Found another hormone released by food which increased energy expenditure
- Combining these gave very good weight loss in animals and man
- **Problem:** the hormones only last 10 minutes
- IF we could make them last a week would be practical for weight loss.
- Low risk
 - Naturally released after meals three times a day
 - Raised levels are probably how bypass surgery works



Drug Idea – cure obesity by giving satiety gut hormones

How to make a
ten-minute
hormone last a
week?



Had idea in 1990, working on it ever since

- Hormones are 30 amino acid peptides
- We made lots of analogues (circa 6,000)
- Big MRC grants to do several phase 1 first time in man trials
- Initial approach of slow release from a subcutaneous depot not adequately effective
- Current approach of sticking to albumin works well



Current progress

- Now have peptides with big weight loss, last over a week, help diabetes and painless injection.
- They are also “druggable” ie cheap to make, very stable and fully patented
- A group of us decided to set up a company “**Zhipp**”
- Funding agreed but knee deep in bureaucracy
- Second spinout so do have experience (first was “Thiakis” and was sold very profitably)



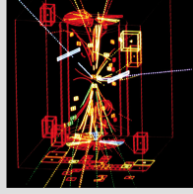
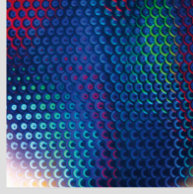
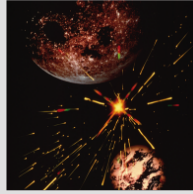


Hammersmith
Campus
in West London

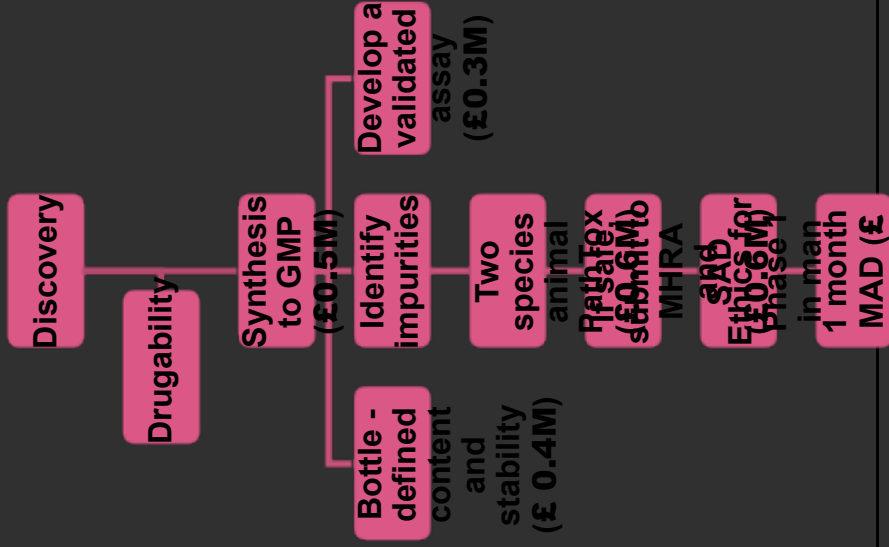
Exciting market potential

- **3 Billion obese people need treatment**
- **800 obesity deaths every day in USA**
- **No medication works well at present**

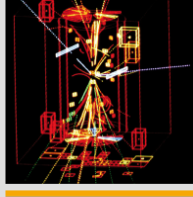
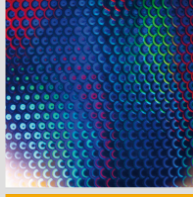
- **Circa 1 billion wealthy obese**
- **Market penetration of, say, 5%**
- **Market price, say, \$60 per weekly injection**
- **Annual cost \$3,000**
- **Annual sales \$150,000,000,000**
- **Over ten year life \$1.5 Trillion licence fees to Imperial**

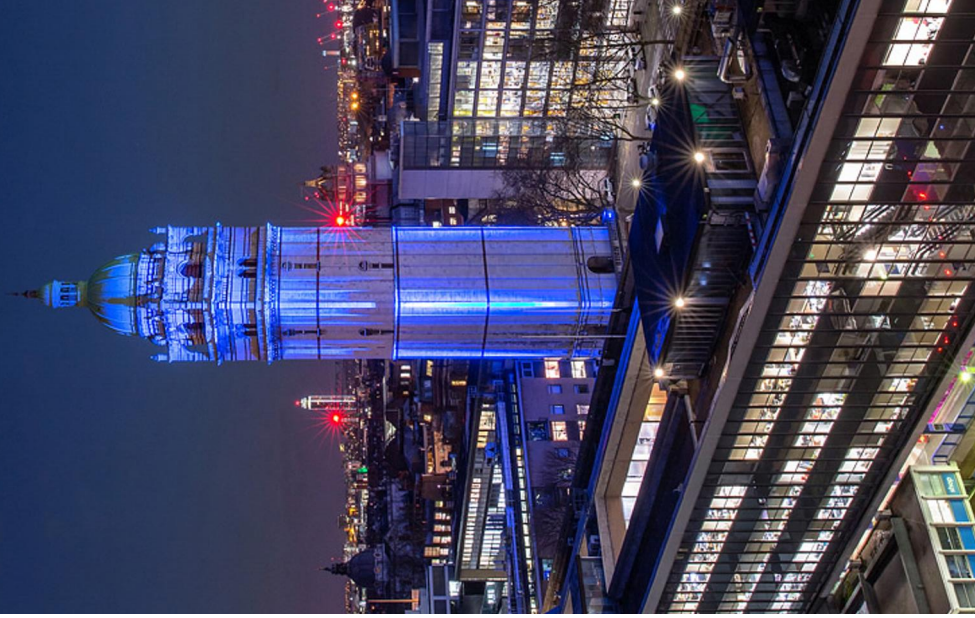


What does £3million buy you?



- Imperial College London's job is to work with Industry
- We have a long history of commercializing (licenses, copyright and spinouts)
- Generates REF impacts and is in line with government strategy
- Drug discovery is a benefit to UK Ltd
- Big financial benefit to College and Faculty through:
1) shares 2) milestone payments 3) licence fees





Conclusion

1. **Drug discovery industry is in Imperial's mission**
2. **Important moral call is to ameliorate suffering**
3. **Education in entrepreneurship and drug development is also a University teaching mission**
4. **Future Imperial financial return – could make the University independent of government finance**
5. **Note that time is of the essence**
 1. **Race with competitors**
 2. **Patents only last 20 years**

