



OLLSCOIL NA GAILLIMHÉ
UNIVERSITY OF GALWAY

Medicinal Chemistry

Medicinal Chemistry Pathway Director
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Top 3 Best-Selling Pharmaceutical Drugs



Eliquis

Bristol Myers Squibb
\$16.7 billion

Anticoagulant



Revlimid

Bristol Myers Squibb
\$12.7 billion

Multiple myeloma

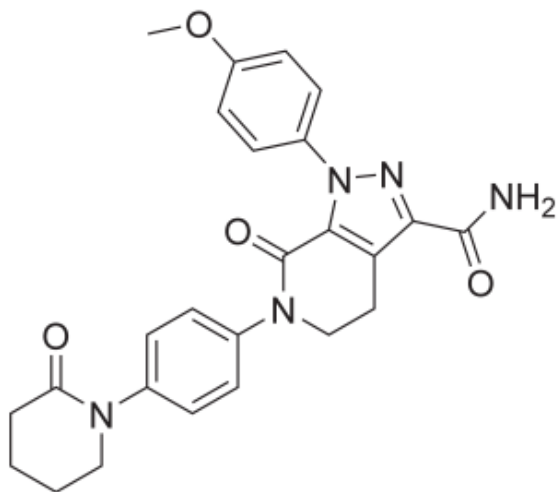


Imbruvica

Janssen
\$9.7 billion

Lymphoma

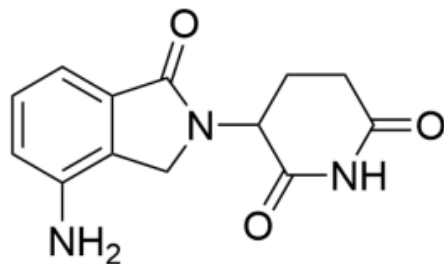
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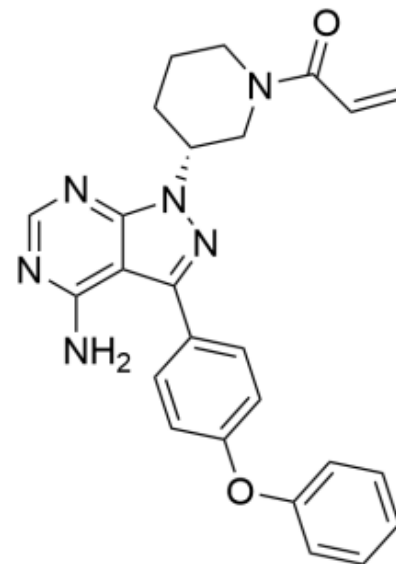
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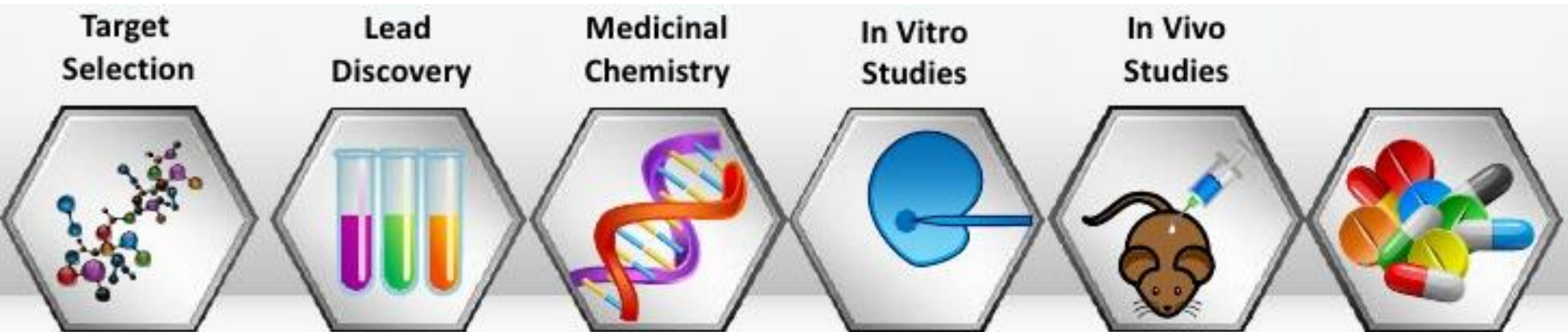


Imbruvica

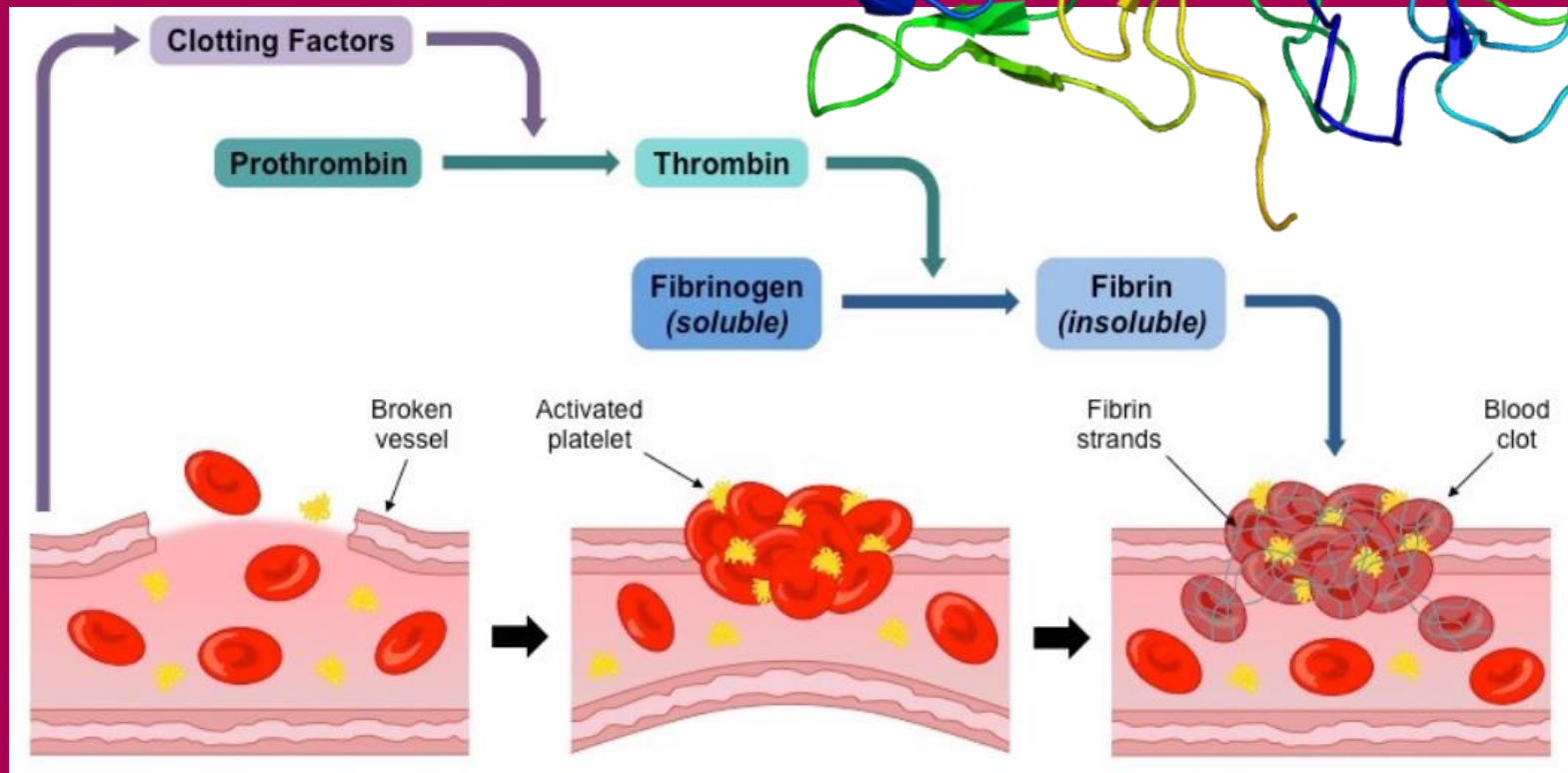
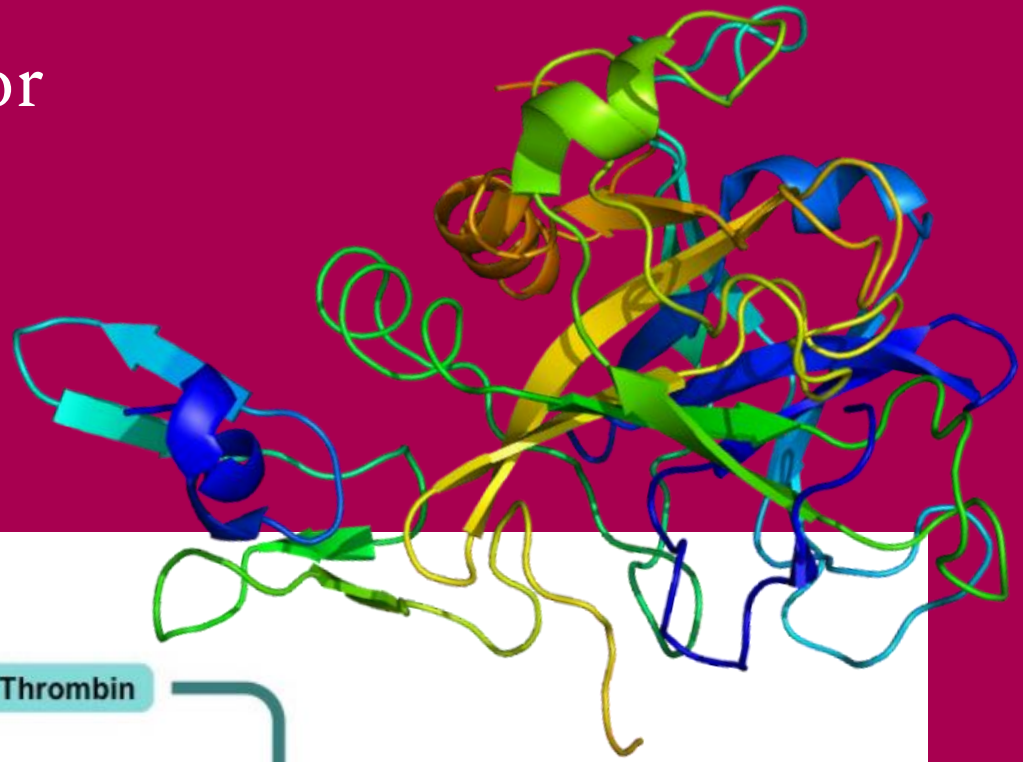
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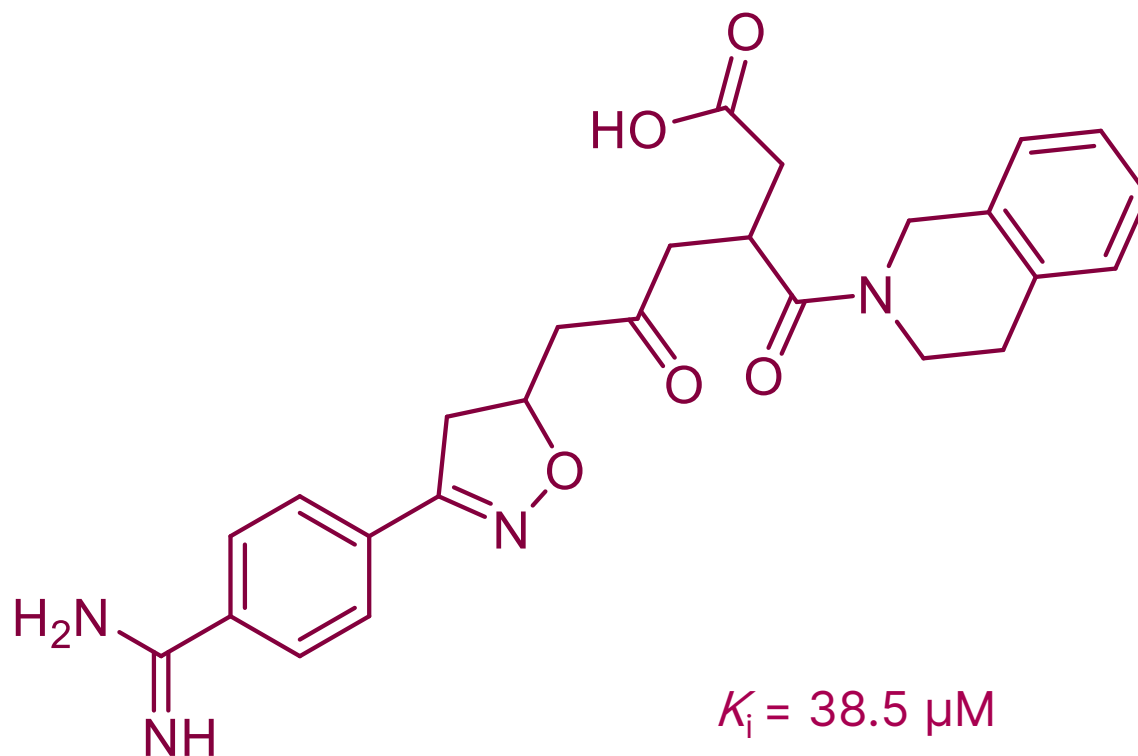
The Drug Development Process (12 – 15 Years)



Stuart Prower Factor (Factor Xa)

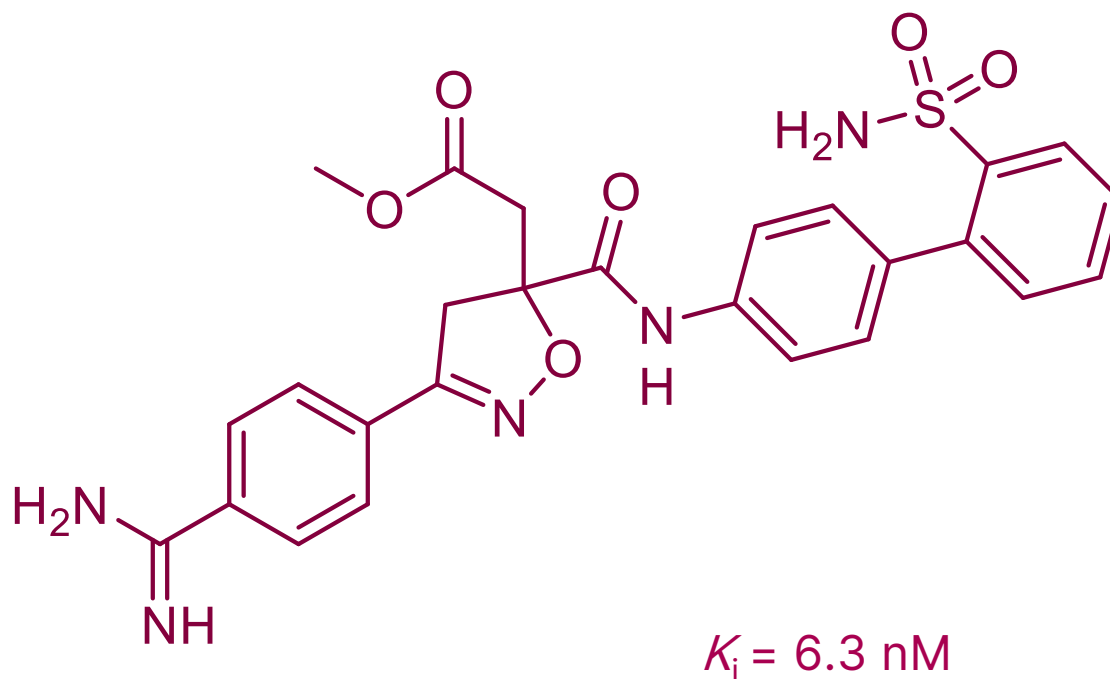


Discovery of Eliquis (apixaban)



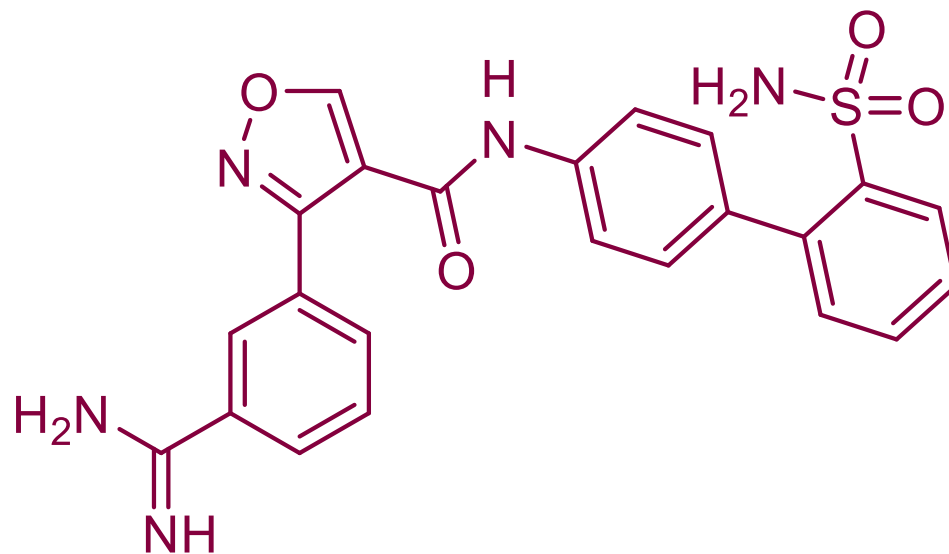
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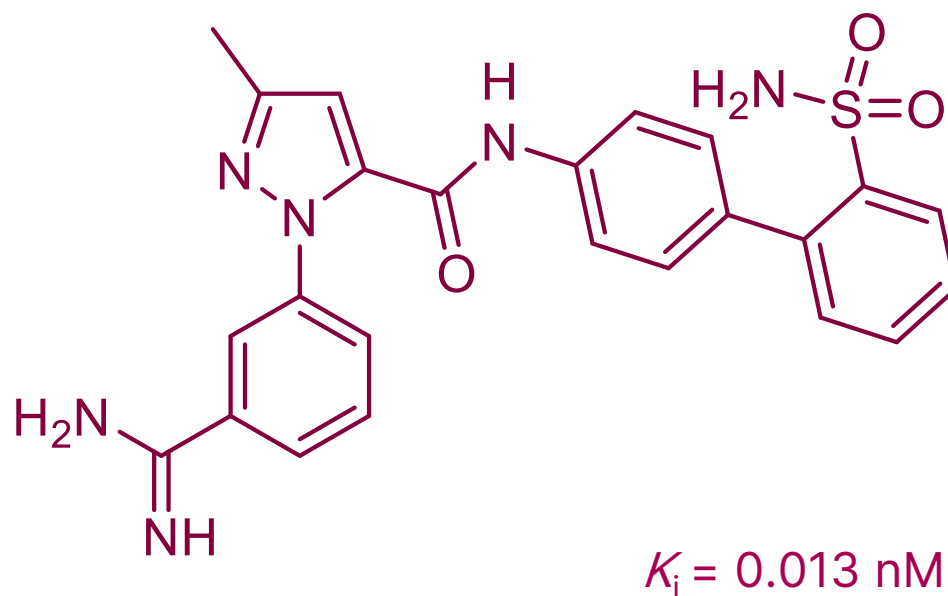
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$$K_i = 0.1 \text{ nM}$$

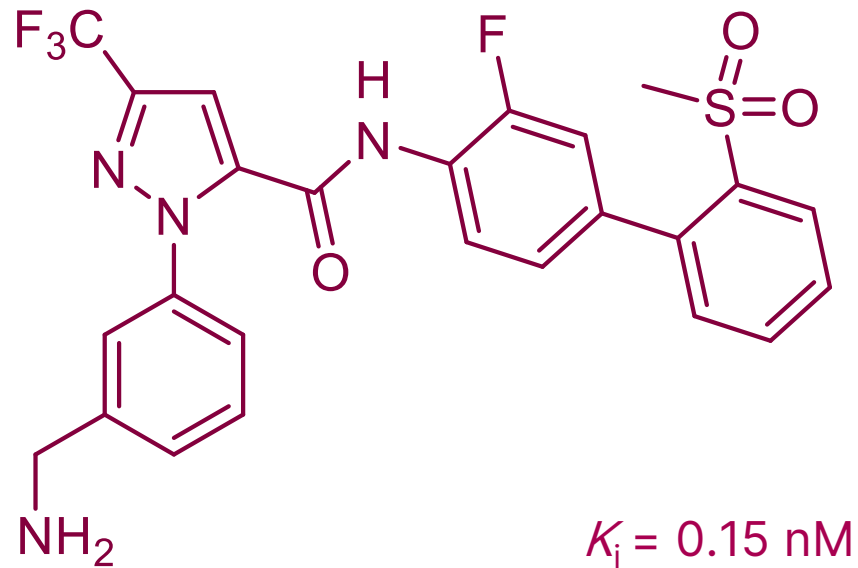
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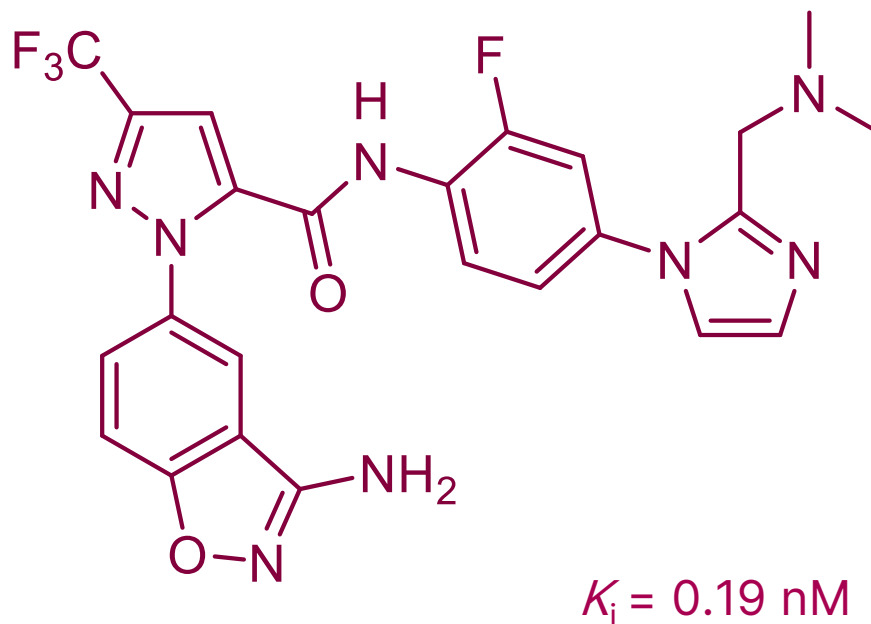
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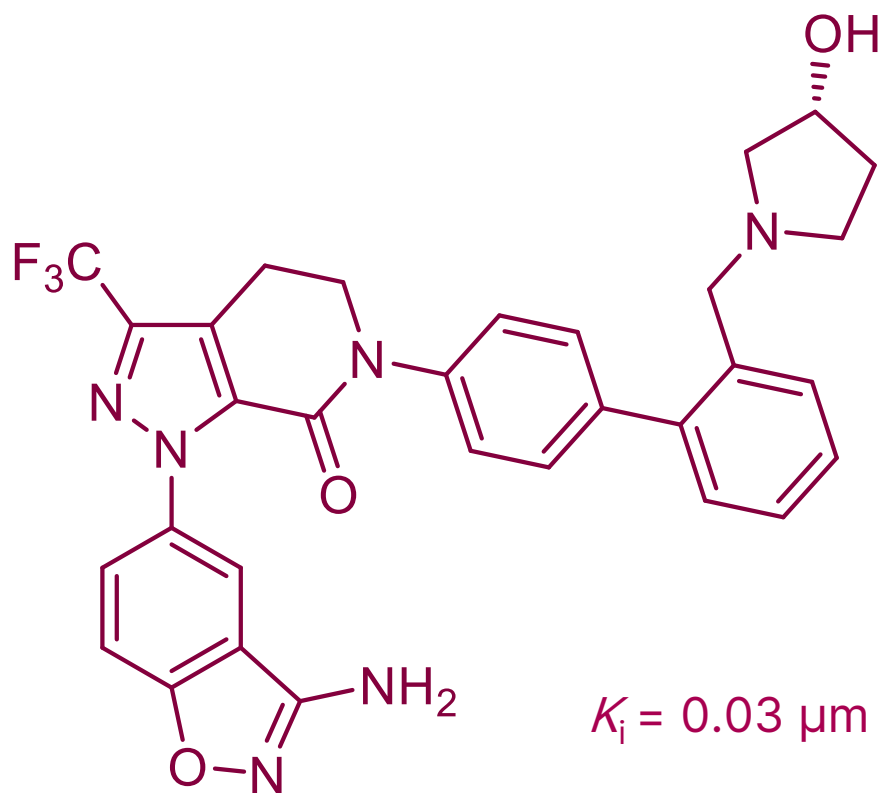
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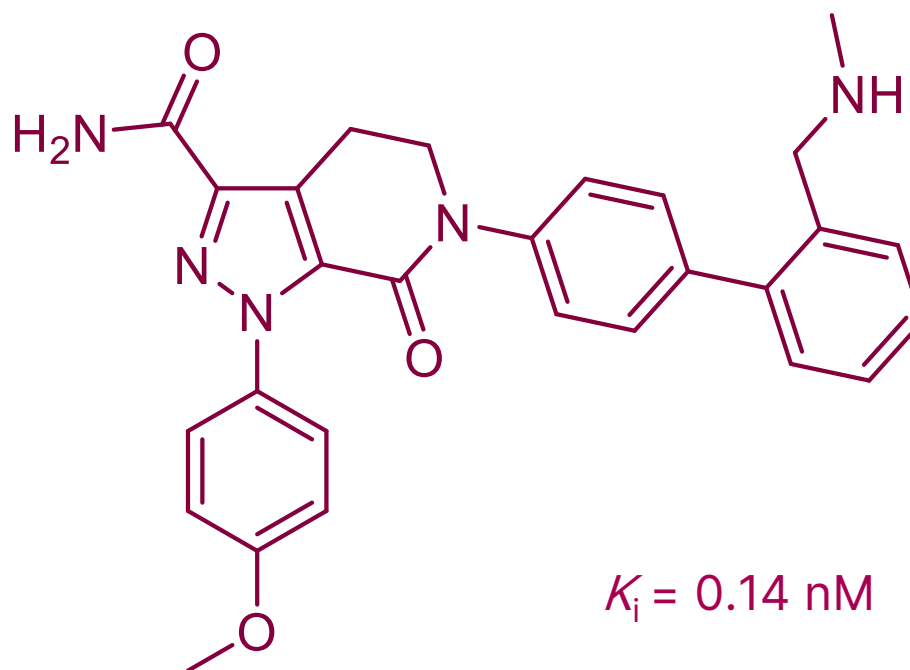
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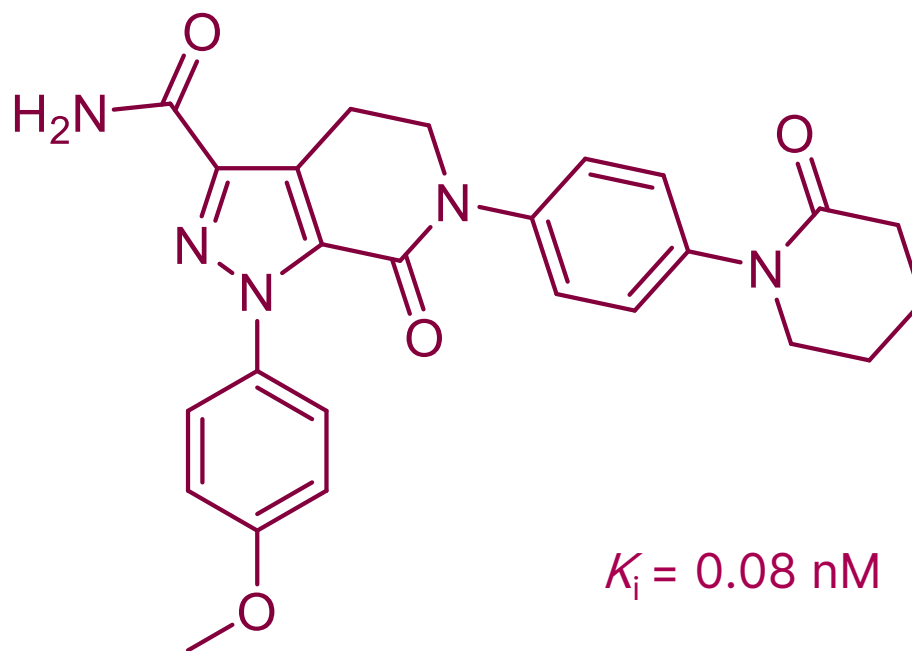
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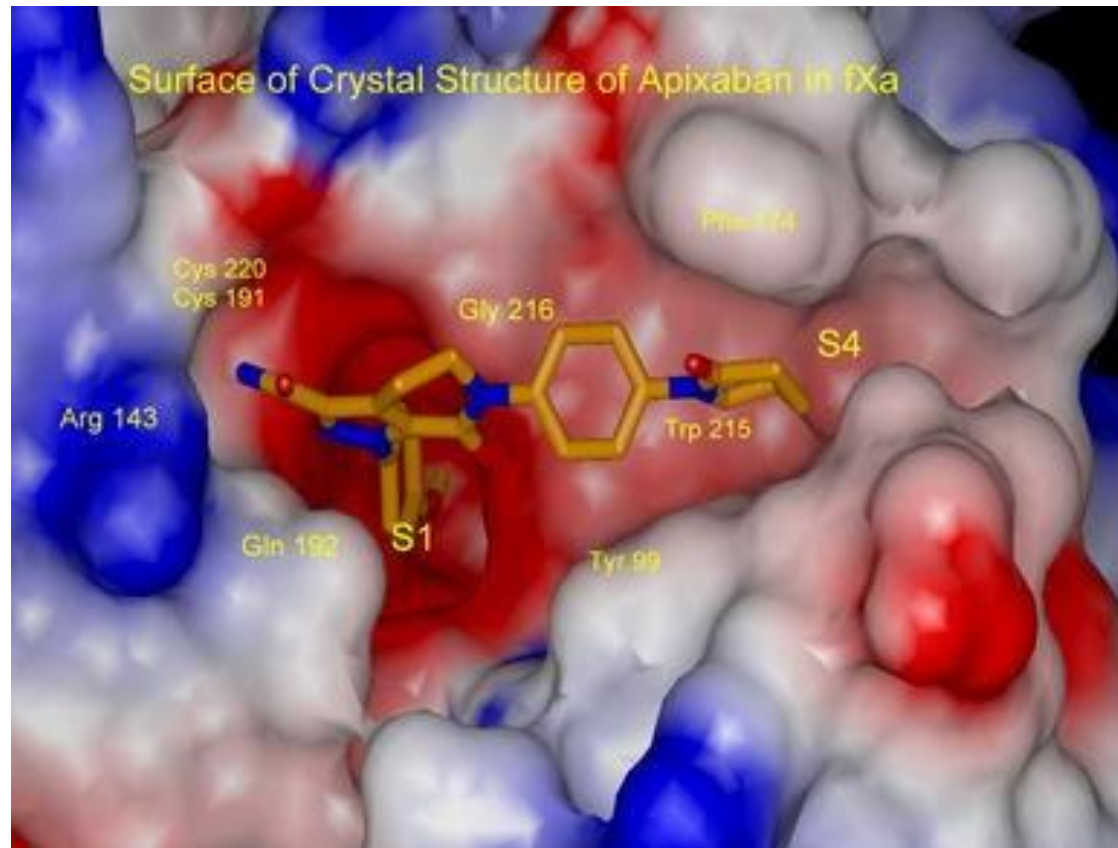
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The job of a medicinal chemist ?



Computational Modelling



**Designing
Synthetic
Routes**



**Working with
other scientists**

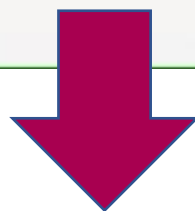
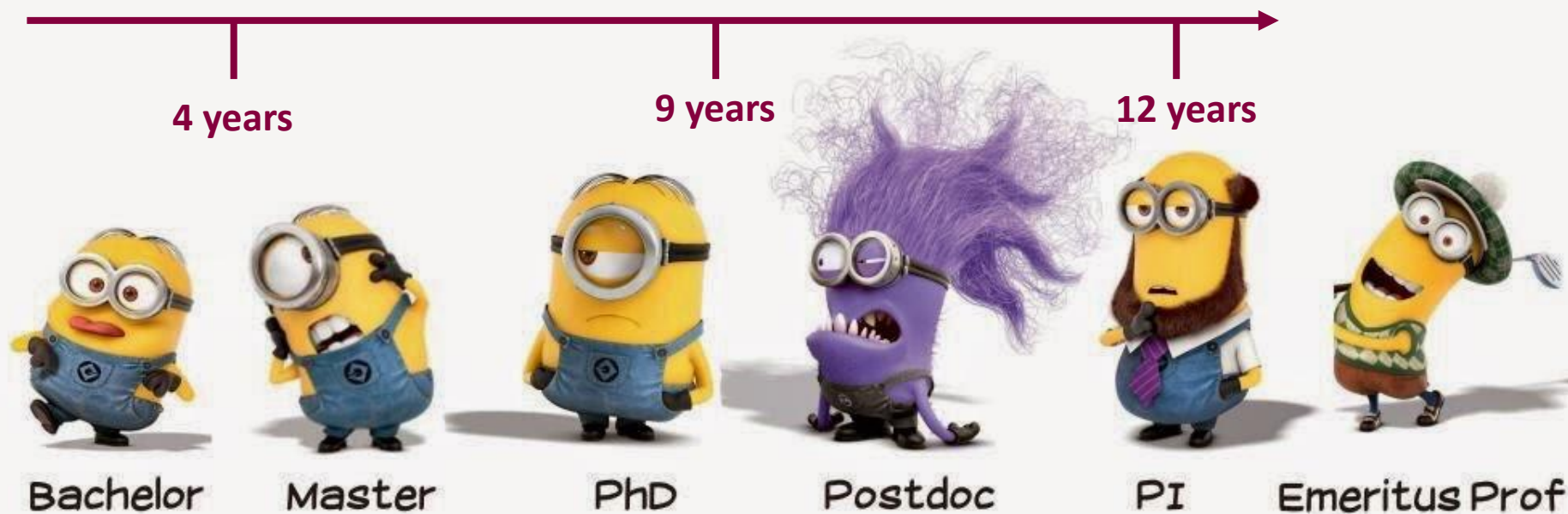


Analysis



Synthesis

How do I become a medicinal chemist ?



Alternative Careers - Postgraduate

4 years

9 years



Bachelor

Master

PhD



2nd/ 3rd Level
Teaching



National/EU
Policy Advisor



Process Chemist



Patent Attorney



Scientific
Publishing



Business
Consulting

Alternative Careers – Graduate Level

4/5 years



Bachelor

Master

Graduate Programmes
Pharma/Biopharma

Analytical Scientist

Technology
Transfer

Teaching

Regulatory
Affairs

Forensics

Journalism

Law

Journalism

Medicine

Chemical
Engineering

Business
Management

Medicinal Chemistry – Bachelor of Science GY301



Year 1 **Chemistry · Physics · Biology**
Mathematics or Applied Mathematics or Mathematical Studies

Year 2 **Medicinal Chemistry · Organic Chemistry · Inorganic Chemistry**
Physical Chemistry · Molecular & Cell Biology · Pharmacology
Applied Concepts in Pharmacology · Choice of other modules

Year 3 **Organic Chemistry · Analytical Chemistry & Molecular Structure**
Experimental Chemistry · Drug Design and Drug Discovery
Physical Chemistry · Inorganic Chemistry · Toxicology
Computers in Chemical Research · Validation in Industry

Year 4 **Current Topics in Medicinal Chemistry · Bioorganic Chemistry**
Independent Research Project · Practical Skills Development
Spectroscopic and Analytical Methods · Bioinorganic Chemistry
Choice of other chemistry modules

Do I need Leaving Certificate Chemistry ?

No !

**We teach assuming you have no
background in chemistry**

**Motivation and enthusiasm are
the primary ingredients for success**

Is Medicinal Chemistry / Chemistry Difficult ?

Students do tend to find chemistry challenging



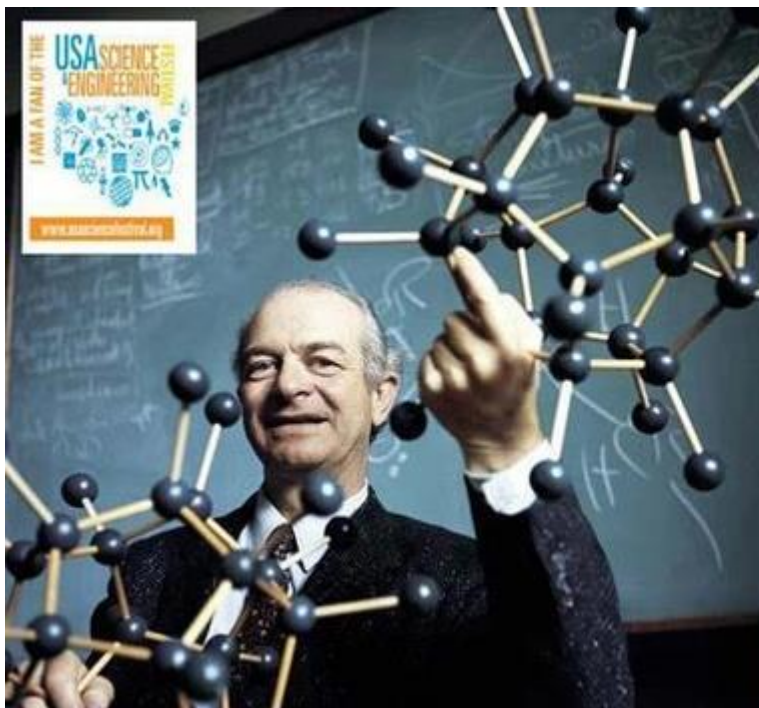
Employers love chemists for their problem-solving and critical thinking skills



To unlock your potential, you need to be challenged. Expect and demand to be challenged. Embrace it!



A final word from Linus Pauling – a two-time Nobel Prize winner



*“I feel sorry for people
who don’t understand
anything about
Chemistry.*

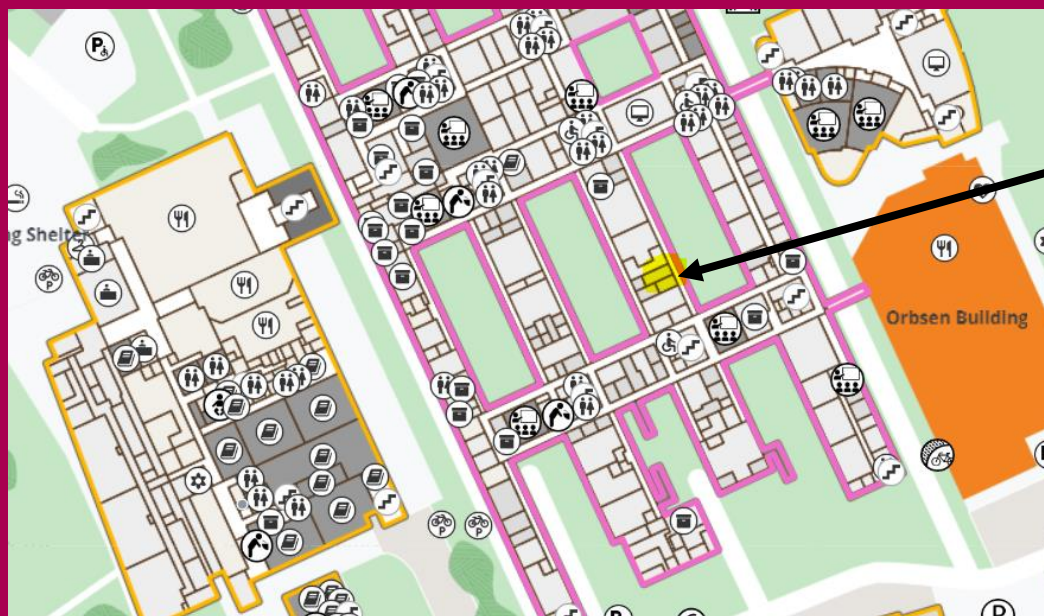
*They are missing an
important source of
happiness!”*

Linus Pauling

Questions ?

Email: Eddie.Myers@universityofgalway.ie

Office : Rm 111
Organic Chemistry Laboratory
(Ground Floor – Arts & Sciences Concourse)



my office
is here