

'A Career in Chemistry and Beyond'

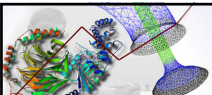





Edinburgh University, May 2020
 Kevin Parker
 KKI Associates Limited
kevin@kkitech.com

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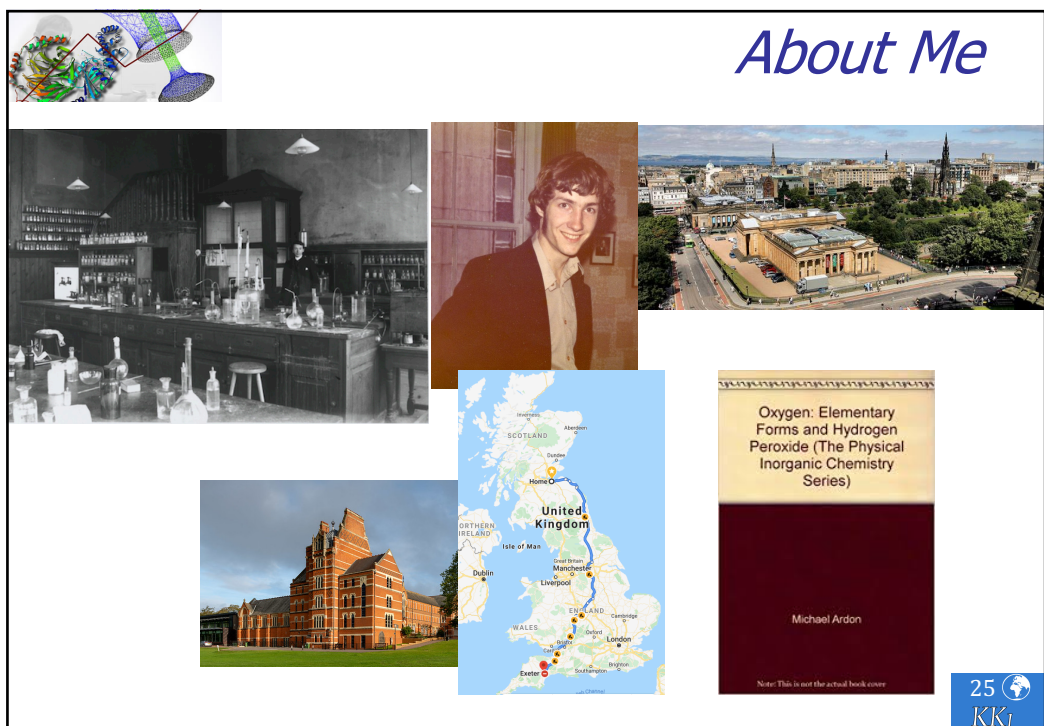
Outline

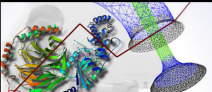



- My Career in Chemistry from School to here!
- Education Edinburgh, Cambridge, LBS
- Work at BP and as a Consultant
- Skills required then and now
 - Tips for managing recessions and home-working

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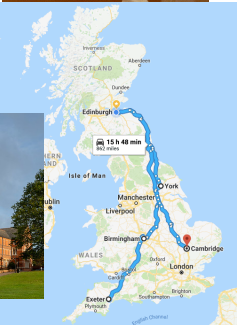




About Me





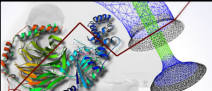






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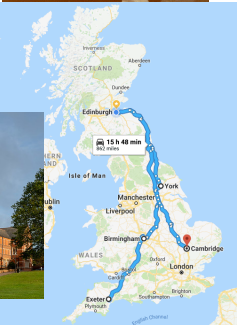
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About Me





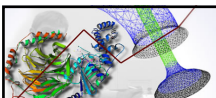






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Things that helped me get a Ph.D

- Realising I wasn't going to be an academic
- Using a template for my thesis write-up
 - 'Write the contents page first'
 - Outlining:

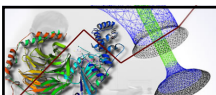
☛ This is my main heading
 ☛ This is my first subheading
 ☛ I will add some more background to the document's purpose here
 ☛ Here is the background in sections
 ☛ Here is another section
 ☛ And another
 ☛ This is Section One
 ☛ This is Section Two
 ☛ This is my concluding page

- Involvement in College Activities
- More exercise
- Hobbies outside the University

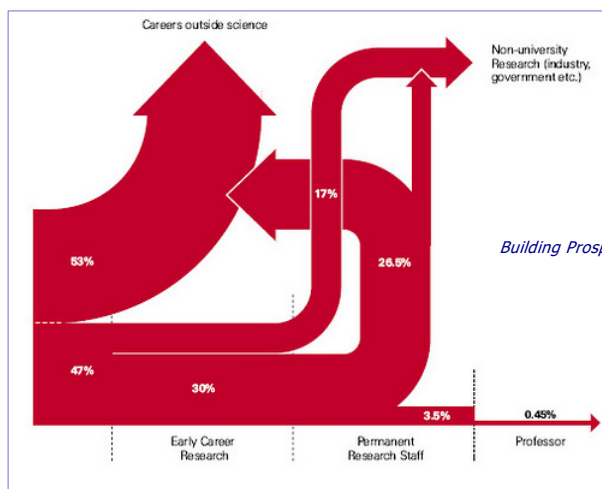


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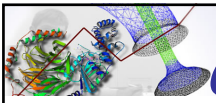
Example Case Study/Slide: Most Ph.D's do not stay in academia



Building Prosperity, Royal Society 2010

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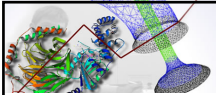
Getting Hired by Big Companies

- Group Interviews
- Assessment Centres
 - Psychometrics
 - Role Play
 - Team Challenges
 - Aptitude Tests
 - Interviews
- Used in military, business, gov, and NGOs



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Getting a Job - R&D



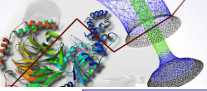
bp

beyond petroleum

- BP (ICI, Shell, P&G, etc) 'Milk Round'
- Main recruitment for Graduate staff into R&D
 - >50% Group R&D on non-Oil technologies
 - Interview: 'Oh you blew up a lab, no problem...'

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'We are blowing up engines'

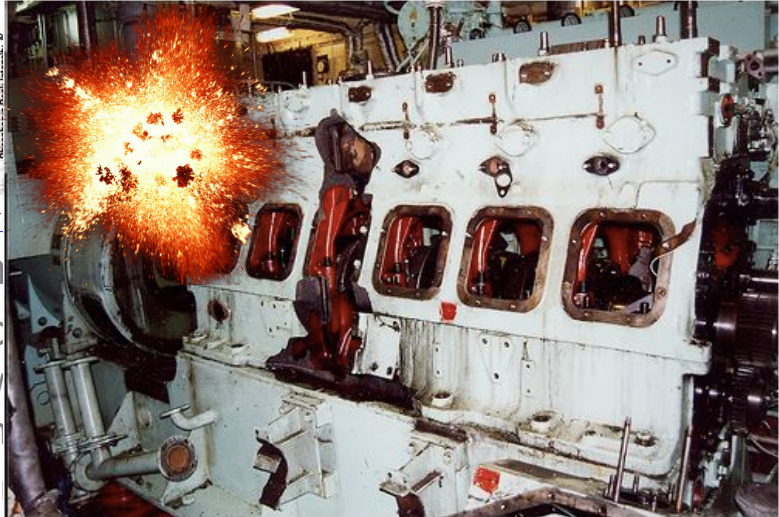




FIG.

temperature

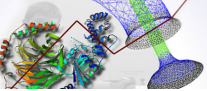
carbox oil

- Fun
- Tec
- 'v
- in
- Tro
- 'We are being sued - a customer's engine has blown up'

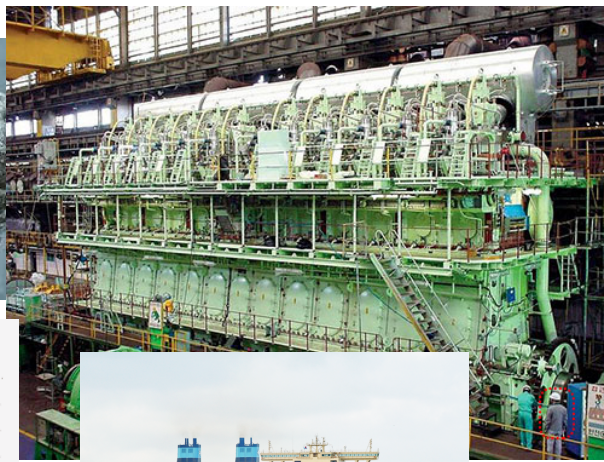
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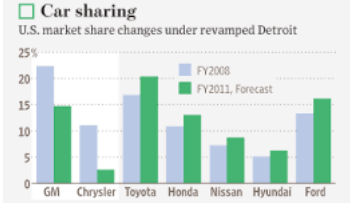
Some really big engines...





Car sharing

U.S. market share changes under revamped Detroit



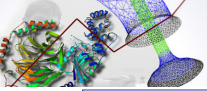
Company	FY2008	FY2011, Forecast
GM	22%	15%
Chrysler	12%	10%
Toyota	18%	20%
Honda	10%	12%
Nissan	8%	10%
Hyundai	5%	7%
Ford	15%	18%

Note: Fiscal years end March 31 of year shown
Source: CLSA Asia-Pacific Markets

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Working in R&D

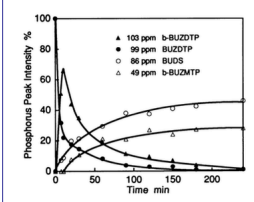
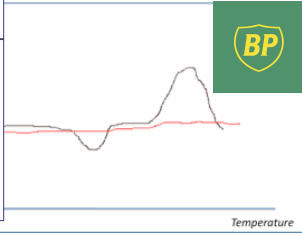


Fig. 2 Time Dependence of Intensities of the Observed ³¹P NMR Signals during Oxidation Process of

Table 3 Rate Constants and Arrhenius Parameters for the Reaction of ZDTPs with CHP in Benzene Solution^a

Temperature [°C]	k_1 [M ⁻¹ s ⁻¹]	
	IPZDTP	BUZDTP
0	—	1.02×10^{-30}
10	1.45×10^{-3}	3.83×10^{-3}
20	1.99×10^{-3}	1.92×10^{-2}
34	1.40×10^{-2}	2.92×10^{-2}
50	$(4.42 \times 10^{-2})^c$	$(0.16)^c$
70	$(0.20)^c$	$(0.78)^c$
$\log[A/M^{-1}s^{-1}]$	9.96	10.78
E_a [kcal/mol]	16.83	17.20

a) [ZDTPs]/[CHP]=0.05 M/0.10 M. b) In hexane solution. c) Extrapolated.

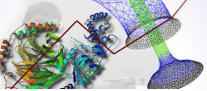


Temperature

- Fundamental Research - performance related
- Technical Service
 - 'We've run out of hydraulic fluid, can we use gearbox oil instead?'
- Trouble-shooting/problem-solving
 - 'We are being sued - a customer's engine has blown up'

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Working in R&D

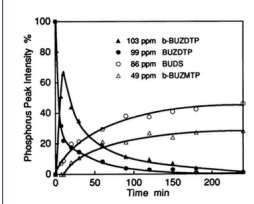
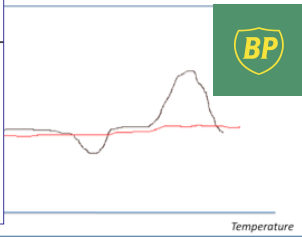


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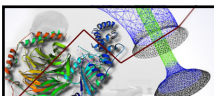
Temperature

- Fundamental Research - performance related
- Technical Service
 - 'We've run out of hydraulic fluid, can we use gearbox oil instead?'
- Trouble-shooting/problem-solving

Key Skill(s) – problem-solving, curiosity

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Product Development

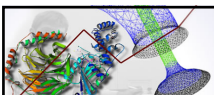
Table 1-EP Gear Lube Specification Criteria Sheet

Properties	Standard	Parameters	Limits									
AGMA Grade			2EP	3EP	4EP	5EP	6EP	7EP	8EP	8AEP	9EP	
ISO-Viscosity Grade	ASTM D 2422		68	100	150	220	320	460	680	1000	1500	
Physical/Chemical												
Viscosity, min	ASTM D 445	cSt@40 deg C	61.2	90	135	184	250	350	500	750	1100	
Viscosity, max	ASTM D 445	cSt@40 deg C	74.8	110	165	242	340	480	680	1000	1500	
Viscosity Index	ASTM D 2270	minimum	90	90	90	90	90	90	90	90	90	
Flash Point, min			170	200	230	260	290	320	350	380	410	
Cloud Point, max			-35	-30	-25	-20	-15	-10	-5	0	5	
Corrosion, max			1	1	1	1	1	1	1	1	1	
Seal Swell, max			250%	250%	250%	250%	250%	250%	250%	250%	250%	
Friction Coefficient, max			0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
Wear, max			0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	
FTIR			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
TD			30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	



Key Skill(s) – team working, knowledge sharing

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Things that helped me

- Lots of Analytical Science
 - Heteronuclear nmr
 - HPLC
 - EXAFS
- The first computers for regression analysis!
- Realising businesses need 80% of the answer in 20% of the time
- More exercise

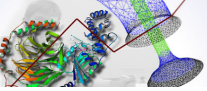


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'A Sticky Situation'

Context-based Learning Exercise for Chemistry Students



Konigsberg in the Mountains

Special Feature: Petra Head

"She's a bit of a goer isn't she?" Hope Michael, commonly known by his nickname 'Open Mike' beams as we get out of his Konigsberg PTV at Savon Valley in the Snowy Mountains. We're now at 8000 ft and the air is noticeably clearer and cooler than at the bottom of the twisty 19 hairpin road up to Michael's new ski development.

I wonder about taking coaches up here but Michael is laughing at me. "No we've blasted a nice wide highway through the Forest on the other side of the hill for them. We're going to keep this road as it is and only let cars on it. We're trying to get a minimum speed limit on it to encourage sports cars to come this way. After all you have black runs on the pistes so why not a black run access route?" I can't quite decide whether he's joking, but having been a passenger in the drive up I'm I think he's probably serious.

The Supercar screamed as we hurtled up the private road, that Michael has been sharing with a few motoring friends. He claims not to have road but does admit to "comparing times now and then, just to see"

They have some nice motors but nothing to touch this one with a hybrid twin turbo, KERS, and all the IT stuff. Is it completely standard I wonder? My last drive in a Konigsberg didn't seem quite as raucous and elemental as this one.

Michael looks a little evasive for a second before admitting 'We've touched nothing much really, just taken a few electrical things out of circuit, heaters (well we're in Australia and all that hot-ter stuff. Doesn't really change the KERS recharge quicker'

"Anyway, fancy taking the wheel on the way down?"

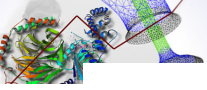
Fastest Gear Magazine Australia





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Technical Sales










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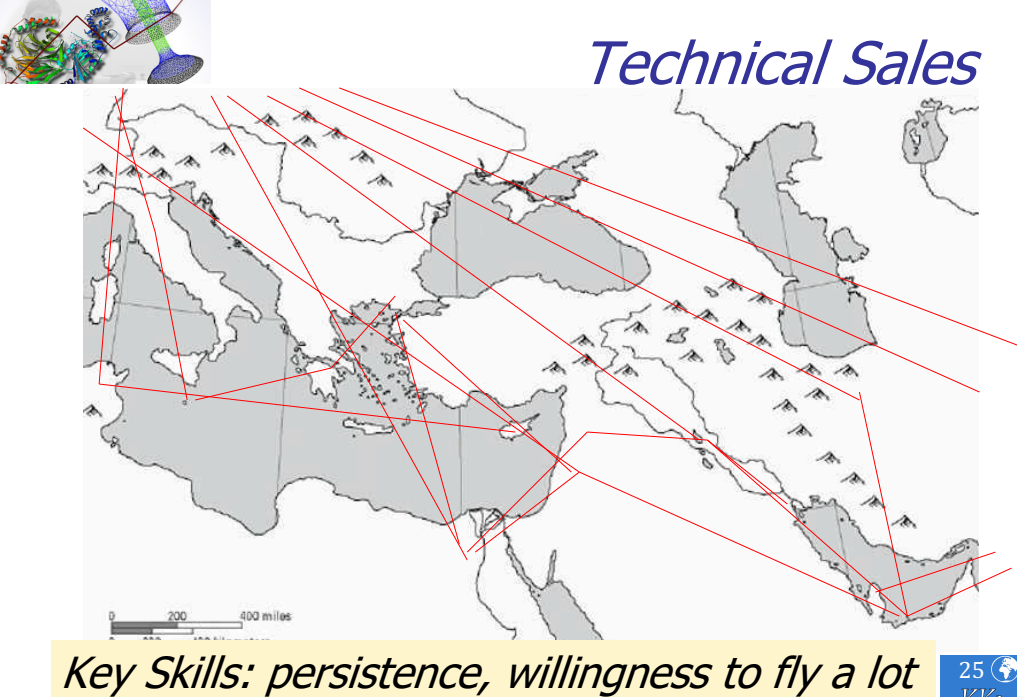
Technical Sales

Key Skills: technical & financial awareness, patience, persistence, negotiation

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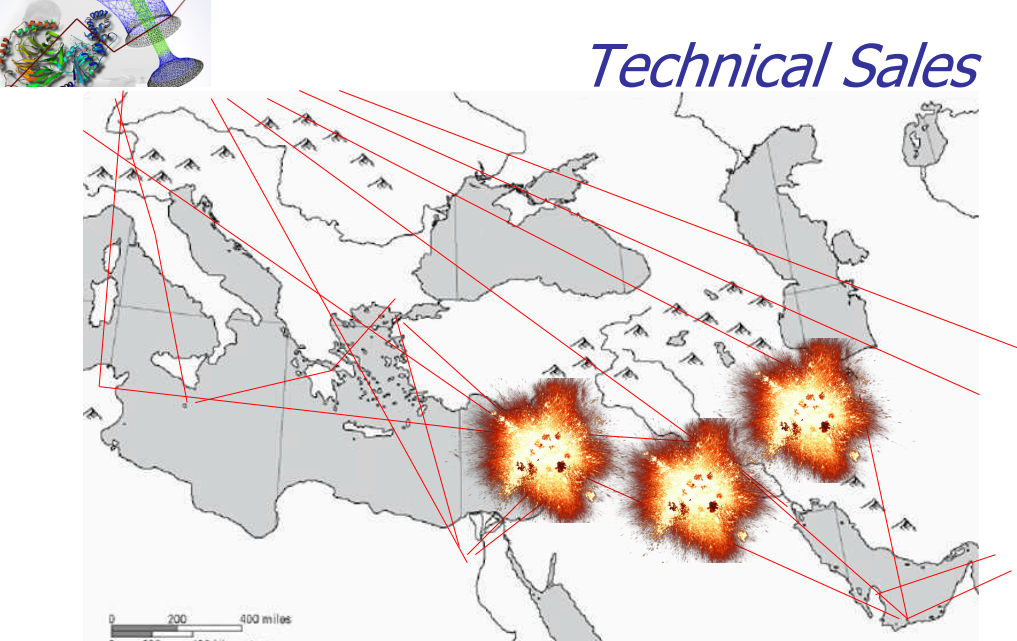
Technical Sales

Key Skills: persistence, willingness to fly a lot

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Technical Sales

Key Skills: being polite to people carrying guns

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Technology Management - HSE

Key Skill(s) – attention to detail, working with people

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Changing BP

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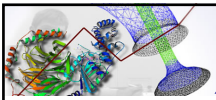
Changing Career – Leaving BP

- London Business School experience is good
 - Very Hard Work, great classmates
- Finish Masters and there is a recession ☹️
 - 250+ job applications in 2-3 years

Remembering the recession: 'The 1990s experience changed my view of the world'



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Advice from Career Consultant

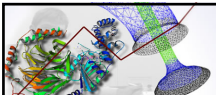
- 'When you're out of Work, get fit'
 - 'It really shows when you get the job interview'
 - (Cycled from Clapham to Baker Street every day)



- 'Look for Work, not a job'
 - Lots of people have 'bits of work' that need doing but don't necessarily want a full-time employee

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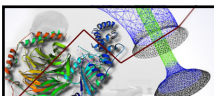
Networking

- For work contacts
- For research projects (information gathering)
- For job searches
 - Your aim: to build up a database/group of people that know you, understand what you can do and what you want to do



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Networking for Shy People...

- Ask a friend to introduce you
- Stand near the food 'the chicken's good'
- Practice 'Openers'
 - Be a good listener - imagine you are interviewing them for a magazine
- 'Open' questions
 - Look for their 4 hooks!
- Practice 'Closers'
 - Its OK to ask people for business cards at a networking event

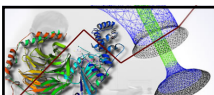
'Hello I'm xxx, I'm at the Royal Society of Edinburgh'

'What is it about your job that you find most frustrating/exciting? Do you have time for outside interests?'

'it was great to meet you, could I call/e-mail or LinkedIn with you sometime?'

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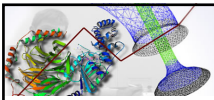


Find your 4 Hooks

- 'I used to sell oil to the Arabs...'
- 'I'm a Cub Scout Leader...'
- 'Although I'm a chemist, I'm mentoring some rock musicians funded by the PSYBT'
- 'on average, 1 in 150 of the people I train become successful/wealthy technology entrepreneurs'

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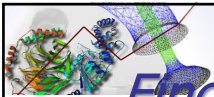
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- 'I'm a Cub Scout Leader...'
- 'Although I'm a chemist, I'm mentoring some rock musicians funded by the PSYBT'
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Hey, I'm really quite an interesting person!

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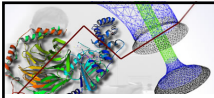
Find your 4 Hooks and relate to others

- 'Oh you've just come back from Jordan - I used to ...'
- 'You've done work with young people'
- 'Hey do you play the electric guitar?'
- 'Oh, are you interested in economic development?'

I bet this person I'm talking to is a really interesting person as well!

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Informational Interviews

- Structured interviews, open-ended questions
 - Don't read out the questions, but use the questions to guide a conversation
 - Similar skills used in networking and job-seeking

How does your industry 'work'?

What do I have to do to be taken seriously in this industry?

What is it about your job that you find most frustrating/exciting?

Do you know anyone who is hiring in your industry?

What skills are in demand these days?

Do you know anyone else I can talk to?

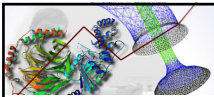
Do you ever get problems with xxxxx?

What made you want to be an astronomer/accountant/ in the first place?



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Business Development





- 'Selling Slovenia to Slough'

Key Skill(s) – curiosity, communication, persistence, commercial awareness

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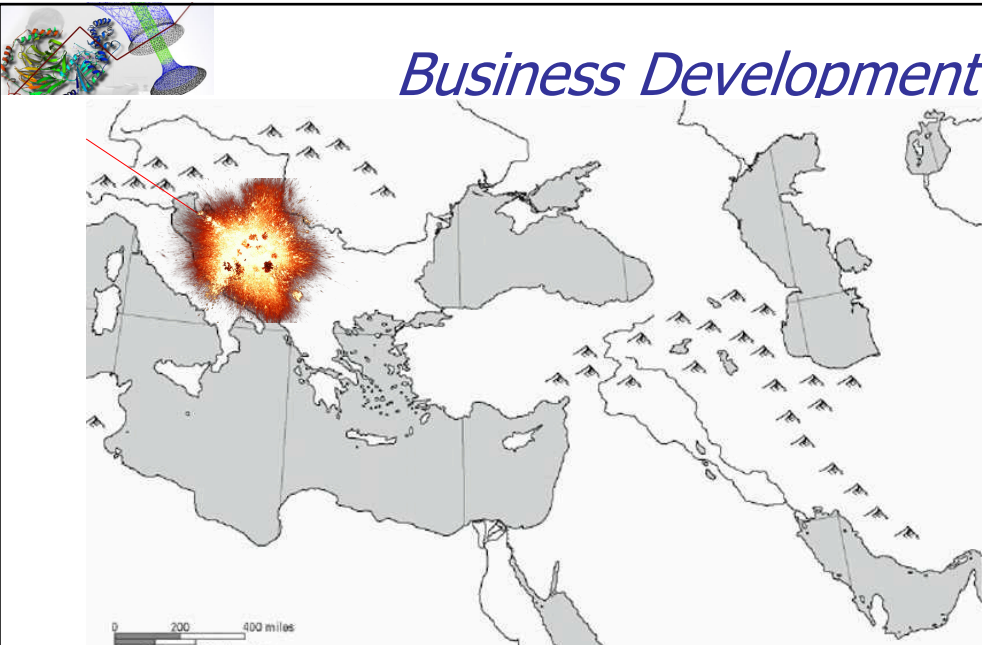


Business Development

Key Skills: flexibility, persistence, languages

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Business Development

Key Skills: flexibility, persistence, languages

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Privatisation Plans and Training

Key Skills: know-how plus facilitation skills

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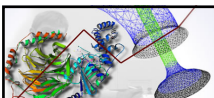


Privatisation Plans and Training

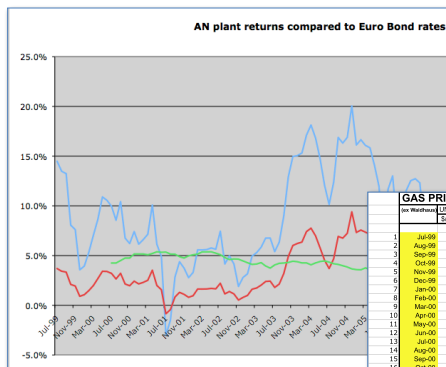
Key Skills: avoiding car crashes

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Technico-economic Studies

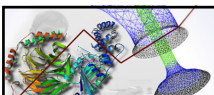


Ammonium nitrate: new plant investment

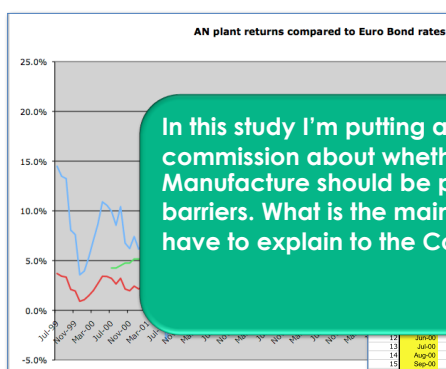
- Location not specified: could be EU, North Africa, CIS
- Typical project configuration
 - 2,400 tpd fertilizer ammonium nitrate (792,000 tpy at 330d/y)
 - Ammonia (1,000 tpd) and nitric acid (1,800 tpd) plants
 - No surplus ammonia or nitric acid
 - Similar to Abu Qir plant configuration (Egypt, 1991)
- Total project cost of US\$600 million (basis November 2007)

GAS PRICES - Russian		UK AN Prices		Capital costs		ROS/ROCE		Percent of		Percent of	
per barrel	UNIT	(Converted to \$/tonne)	(\$/m)	(\$/m)	Index	Costs	ROS	ROCE	Implied Risk Premium	AN Price Mean	P.S.Dev
1	Jul-99	1.62	138.50	430.28	379	Jul-99	30.7%	11.2%	Jul-99	138.5	
2	Aug-99	1.69	138.15	430.60		Aug-99	29.7%	10.8%	Aug-99	138.2	
3	Sep-99	1.68	137.19	430.92		Sep-99	29.6%	10.6%	Sep-99	137.2	
4	Oct-99	2.24	141.72	431.24		Oct-99	23.9%	8.8%	Oct-99	141.7	
5	Nov-99	2.18	138.76	431.57		Nov-99	23.8%	8.5%	Nov-99	138.8	
6	Dec-99	2.48	137.97	431.89	390.6	Dec-99	19.8%	7.0%	Dec-99	138.0	
7	Jan-00	2.78	147.55	432.21		Jan-00	19.1%	7.2%	Jan-00	147.6	
8	Feb-00	2.78	151.18	432.53		Feb-00	20.1%	7.8%	Feb-00	151.2	
9	Mar-00	2.72	153.98	432.86		Mar-00	21.5%	8.4%	Mar-00	154.0	
10	Apr-00	3.09	170.24	433.18		Apr-00	21.8%	9.4%	Apr-00	170.2	
11	May-00	2.91	171.71	433.50	Plant	May-00	23.9%	10.3%	May-00	171.7	
12	Jun-00	3.09	176.48	433.83	1%	Jun-00	23.2%	10.2%	Jun-00	176.5	
13	Jul-00	3.15	176.48	434.15	Inflation	Jul-00	22.6%	9.9%	Jul-00	176.5	165.5
14	Aug-00	3.08	169.77	434.47		Aug-00	21.7%	9.1%	Aug-00	169.8	166.2
15	Sep-00	2.88	169.24	434.80		Sep-00	23.5%	9.8%	Sep-00	169.3	167.0
16	Oct-00	3.40	174.15	435.12		Oct-00	19.5%	8.3%	Oct-00	174.1	168.0
17	Nov-00	3.45	174.02	435.45		Nov-00	19.0%	8.0%	Nov-00	174.0	168.9

- Trade Bodies, Governments, NGOs



Technico-economic Studies



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 - No surplus ammonia or nitric acid
 - Similar to Abu Qir plant configuration (Egypt, 1991)
- Total project cost of US\$600 million (basis November 2007)

In this study I'm putting a case to the EU commission about whether Ammonia Manufacture should be protected by tariff barriers. What is the main bit of science I have to explain to the Commissioners?

GAS PRICES - Russian		UK AN Prices		Capital costs		ROS/ROCE		Percent of		Percent of	
per barrel	UNIT	(Converted to \$/tonne)	(\$/m)	(\$/m)	Index	Costs	ROS	ROCE	Implied Risk Premium	AN Price Mean	P.S.Dev
1	Jul-99	1.62	138.50	430.28	379	Jul-99	30.7%	11.2%	Jul-99	138.5	
2	Aug-99	1.69	138.15	430.60		Aug-99	29.7%	10.8%	Aug-99	138.2	
3	Sep-99	1.68	137.19	430.92		Sep-99	29.6%	10.6%	Sep-99	137.2	
4	Oct-99	2.24	141.72	431.24		Oct-99	23.9%	8.8%	Oct-99	141.7	
5	Nov-99	2.18	138.76	431.57		Nov-99	23.8%	8.5%	Nov-99	138.8	
6	Dec-99	2.48	137.97	431.89	390.6	Dec-99	19.8%	7.0%	Dec-99	138.0	
7	Jan-00	2.78	147.55	432.21		Jan-00	19.1%	7.2%	Jan-00	147.6	
8	Feb-00	2.78	151.18	432.53		Feb-00	20.1%	7.8%	Feb-00	151.2	
9	Mar-00	2.72	153.98	432.86		Mar-00	21.5%	8.4%	Mar-00	154.0	
10	Apr-00	3.09	170.24	433.18		Apr-00	21.8%	9.4%	Apr-00	170.2	
11	May-00	2.91	171.71	433.50	Plant	May-00	23.9%	10.3%	May-00	171.7	
12	Jun-00	3.09	176.48	433.83	1%	Jun-00	23.2%	10.2%	Jun-00	176.5	
13	Jul-00	3.15	176.48	434.15	Inflation	Jul-00	22.6%	9.9%	Jul-00	176.5	165.5
14	Aug-00	3.08	169.77	434.47		Aug-00	21.7%	9.1%	Aug-00	169.8	166.2
15	Sep-00	2.88	169.24	434.80		Sep-00	23.5%	9.8%	Sep-00	169.3	167.0
16	Oct-00	3.40	174.15	435.12		Oct-00	19.5%	8.3%	Oct-00	174.1	168.0
17	Nov-00	3.45	174.02	435.45		Nov-00	19.0%	8.0%	Nov-00	174.0	168.9

- Trade Bodies, Governments, NGOs

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MicroRNA 2008

Select Biosciences Limited
January 1, 2008
197 Pages - Pub ID: SBS1774166

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Abstract **Table of Contents** **Related Reports**

Chapter I. Executive Overview of the microRNA Space

- Introduction to microRNAs
- microRNA Biosynthetic Steps
- Precursor versus Mature microRNAs
- Mechanism of Action
- microRNAs and other Non-coding Small RNAs
- Comparison of microRNAs and siRNAs
- microRNAs Described in Various Species
- Criteria used to Identify Novel microRNAs
- Online Resources for microRNA Target Predictions
- Expression Patterns of Mammalian microRNAs
- microRNAs and Biological Pathways
- microRNAs Implicated in Disease
- microRNAs Associated with Human Cancer
- microRNA Expression Profiling in Human Cancers
- Virus-encoded microRNAs
- microRNAs and their Targets
- Argonaute Proteins
- Growth and Evolution of the microRNA Space

Chapter II. Products and Services for microRNA Research

- Market Segments of microRNA Research
- Products and Services in Each Market Segment

Chapter III. microRNA Market Analysis

- microRNA Research Trends
- Market Segmentation

Key Skill(s) – curiosity, communication, commercial awareness

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Project Management

Technical Activities

- Hire staff
- Purchase PC
- Model detector alignment
- Review instrumentation options
- Write Software
- Copyright software
- Initial approach to commercial partner
- Fall-back commercial option
- Review/improve
- Test operation
- Sensitivity/specificity
- Resolution
- Reproducibility
- Systematic trials
- Clinical benefit analysis
- Transfer to regular use at ARI

Joint Activities

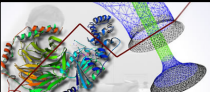
- Check no conflicting patents
- Management structure
- Release funds
- Brief Royal Infirmary
- Patentability review
- Design rights
- Review Project Status
- Patenting
- Review market scope
- Sample oncology departments
- software assessment & verification
- Cost benefit analysis
- FDG supply contract
- Detailed license agreement

Commercial Activities

- Confidentiality agreements
- Commercial partner identification
- Route into partner
- Initial approach to commercial partner
- Fall-back commercial option
- Heads of agreement with commercial partner
- FDG supply contract
- Detailed license agreement

Key Skill(s) – problem-solving, team-working, communication

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Policy Work

 Chemical dual-use awareness

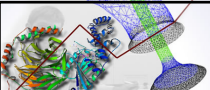
Dual use chemicals: Chemicals that can be used for both legal and illegal purposes.




Key Skill(s) – problem-solving, team-working, communication

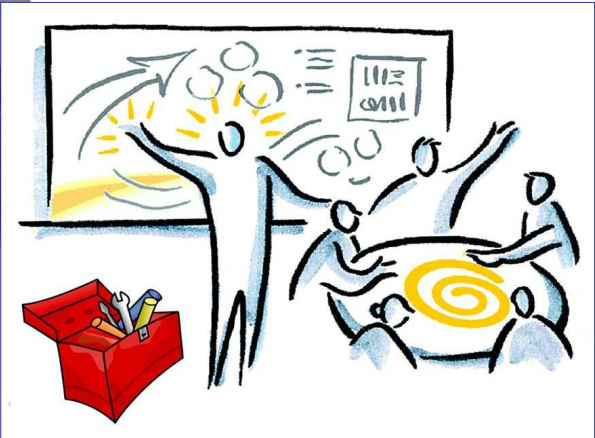
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Facilitation Work

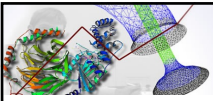




Key Skill(s) – problem-solving, team-working, communication

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Universities are Businesses as well

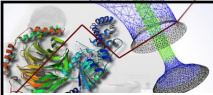


Key Skill(s) – commercial awareness, team-working, communication, patience, and attention to detail



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These days...



I turn students ...



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These days...

... into successful entrepreneurs

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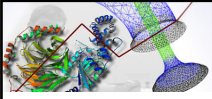
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Some KKI Clients

Successful entrepreneurs

KKI

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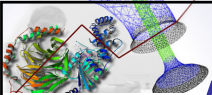
Things that helped me Work from Home

- 'Journey to Work'
 - School run, or just 'walk round the block'
- Set up as good an 'office space' as you can
- Put work clothes on at home
- Have 'to-do' lists
- Regularly 'Touch Base' with contacts
 - Use the phone!



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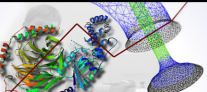
Resilience and Mental Health when Freelancing

- 'Goof off' positively
- At bed-time do a 'brain-dump' onto your to-do list
- Have an engrossing hobby or voluntary activity
 - don't define yourself as a 'Ph.D student'
- Have a 'done list' to boost morale
- Fresh Air/Exercise, esp in winter



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Doing research is a great start to your career...



What do research staff do next?
2016

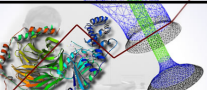
- Careers of researchers who move into occupations beyond academia
- Challenges, career motivations and use of competencies
- Advice for research staff on making successful transitions to other occupations

<https://www.vitae.ac.uk/impact-and-evaluation/what-do-researchers-do/WDRSDN>



CRAC
Vitae and its membership programme is led and managed by CRAC: The Career Development Organisation

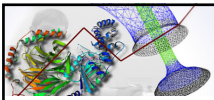
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Doing research is a great start to your career...

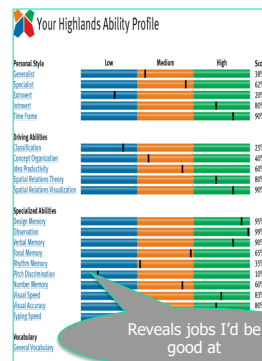


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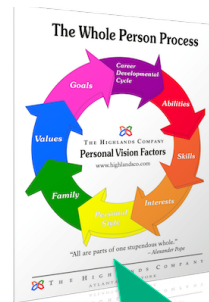


Identifying your Skills and Inclinations

■ The Highland Battery Tests



Reveals jobs I'd be good at

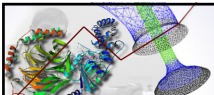


Reveals jobs I'd love doing

Is there an overlap?

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Thinking about Skills

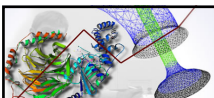
Technical Skills – *my specialism and its context*

Functional Skills – *that let me actually do things*

Personal Skills – *that help me work with other people*

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Putting my Knowledge into Context

- 'I'm a PhD student developing metabolic algorithms'
 - 'We can predict blood sugar levels ahead of insulin injection'
 - 'We can change the lives of 5m diabetics in the UK'

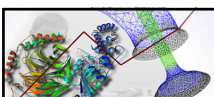


Q.5 A summers day in Scotland and the Sahara, two sets of identical PV cells – which provides the most energy?



- 'Science in the Real World Quiz'
 - <http://www.kkitech.com/ScienceQuiz.pdf>

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Key Functional skills...

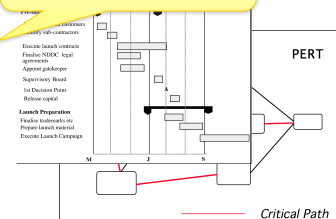
Basic Finance
and budgets

Researching markets
and opportunities

Broad knowledge
Science

Languages

Project Management



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Key Functional skills...

Shipping ▾ Favorites Bar ▾ Travel ▾ Work ▾ Hobbies/interests ▾ Science Geology ▾ News ▾ Google Wikipedia Facebook IntellAD ▾

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What do you need to be an entrepreneur...

Determination

Communication skills

Good with people, team-work

Good at Problem-solving

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What Makes for Employability?

KKI Associates and the University of Edinburgh asked 6 major employers of chemistry, physics and life science graduates what they looked in their recruits

Key findings – potential recruits need to be good at

Innovation
Working in team based activities
Problem solving
Working through formal project/process systems
Integrating their specialist knowledge with others
Communication Skills

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What do you need to be 'Employable'?

Key findings – potential recruits need to be good at

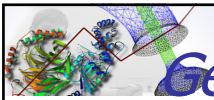
Innovation
Working in team based activities
Problem solving
Working through formal project/process systems
Integrating their specialist knowledge with others
Communication Skills

Good with people,
team-work

Good at Problem-
solving

2011-2 KKI and Edinburgh School Chemistry project for RSC
 Procter and Gamble, Afton Chemicals (Ethyl),
 Ingenza, Syngenta, Sasol, GSK, Selex-Galileo

60



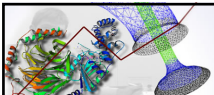
Getting Hired by Big Companies

- Group Interviews
- Assessment Centres
 - Psychometrics
 - Role Play
 - Team Challenges
 - Aptitude Tests
 - Interviews
- Used in military, business, gov, and NGOs
- Be aware of your Belbin test profile
 - Co-Ordinator and Resource Investigator traits



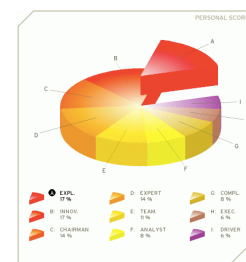
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Belbin Team Roles Analysis

- Its good to have a mixture of
 - 'Plant' (good Ideas)
 - 'Shaper' (gets things going)
 - 'Completer-finisher' (details correct)
 - 'Worker' (does the work)
 - 'Implementer' (encourages everyone)
 - 'Co-ordinator'* (gets everyone's views heard)
 - 'Resource Investigator'* (finds out how to do things)
- Belbin Team Role Analysis – what are you?



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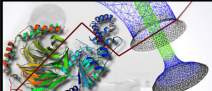
What do you need to be 'Employable'?

All our roles contain a component of working in a team and we are looking for people who can work well as part of a team and perhaps ultimately want to lead teams. Your CV should also give examples of teamworking if you have them. This could be gained in a number of ways: at school, with your family, in a sports team, at work, in voluntary organisations (such as the Guides, Scouts or Cadets), or as part of religious or community activities. Be prepared to discuss your experiences and what you learned about yourself and others.

Careers - Merchandise - Gallery

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Key Personal skills...

Want to work on big problems

Good at Problem-solving

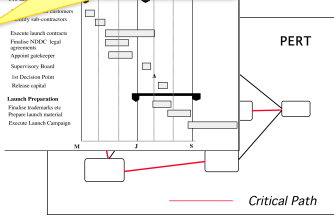
Good with people, team-work

Communication skills

Outline Budget Plan for IT Project											
Item	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Hardware	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Software	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Personnel	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Travel	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Other	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000



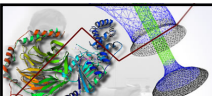
Can put research into context



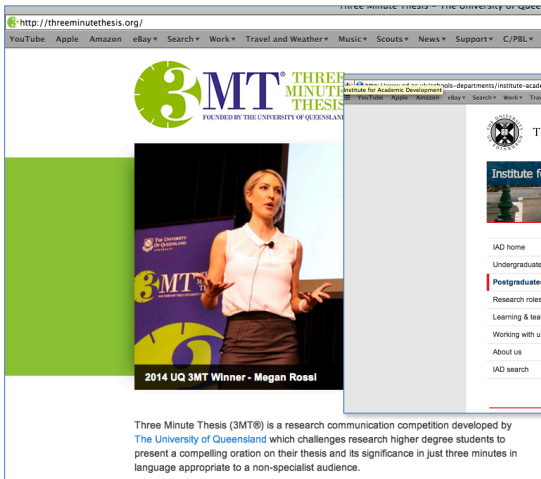
Christine Ortiz Dean for Graduate Education MIT

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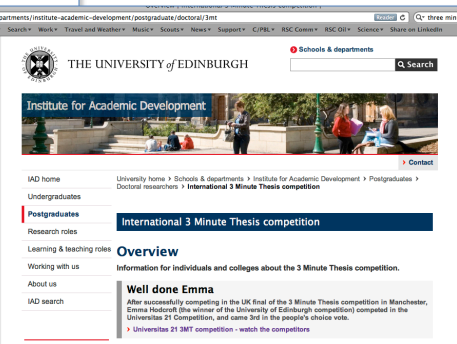
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'Three Minute Thesis'

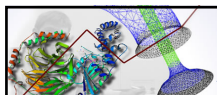


Three Minute Thesis (3MT®) is a research communication competition developed by The University of Queensland which challenges research higher degree students to present a compelling oration on their thesis and its significance in just three minutes in language appropriate to a non-specialist audience.



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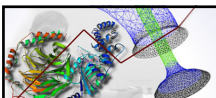
Environment YES and Biotechnology YES

- Competition for Post-grad students
- Teams 4-6
- 'Pretend technical idea'
- Real business plan presentation to 'real dragons'
- Learn about operations, markets, finance
- 3 days regional workshops in autumn
- Winners get 2 days in London in Dec
- £2500 top prize



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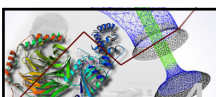


Things that helped me survive

- Get out and meet people, don't just stay at home answering adverts
 - 'Look for work not a job'
- Have a 'to do' list and a 'I've done it' list
- Learn how to do networking and informational interviews
- Build your team skills doing voluntary work
 - especially during shutdown
- Take as much exercise as you can
 - Vitamin D...

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A Career in Chemistry and Beyond

THE END

QUESTIONS?

- TAKE LOTS OF EXERCISE
 - be and look healthy

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Skills for the future: Meta-skills

Timeless, higher order skills that support the development of additional skills and promote success in whatever context the future brings

Self management

Taking responsibility for your own behaviour and wellbeing

Focussing

The ability to manage cognitive load by filtering and sorting information in order to maintain a sense of focus in an age of information overload and constant change

Integrity

Acting in an honest and consistent manner based on a strong sense of self and personal values

Adapting

The ability and interest to continue to enlarge knowledge, understanding and skills in order to remain adaptive and resilient as circumstances change

Initiative

Readiness to get started and act on opportunities built on a foundation of self belief

Social intelligence

Awareness of others' feelings, needs, and concerns in order to effectively navigate and negotiate complex social relationships and environments

Communicating

The ability to openly and honestly share information in a way that creates mutual understanding about others' thoughts, intentions and ideas

Feeling

Considering impact on other people by being able to take a range of different thoughts, feelings and perspectives into account

Collaborating

The ability to work in coordination with others to convey information and tackle problems

Leading

The ability to lead others by inspiring them with a clear vision and motivating them to realise this

Innovation

The ability to define and create significant positive change

Curiosity

The desire to know or learn something in order to inspire new ideas and concepts

Creativity

The ability to imagine and think of new ways of addressing problems, answering questions or expressing meaning

Sense making

The ability to determine the deeper meaning or significance of what is being expressed and to recognise wider themes and patterns in information

Critical thinking

The ability to evaluate and draw conclusions from information in order to solve complex problems and make decisions

Skills Development Scotland desirable skills matrix - 2020

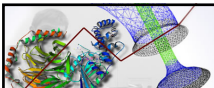
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My Hobbies

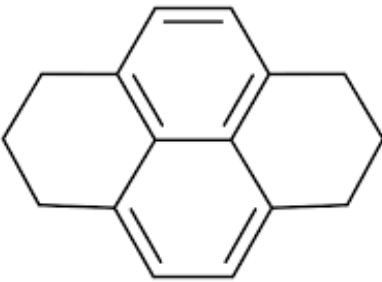
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Working in R&D



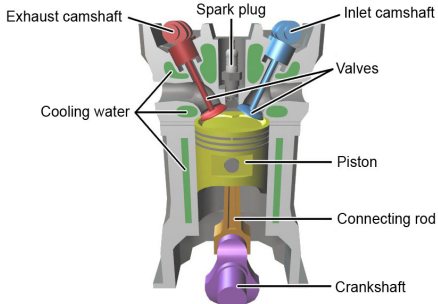
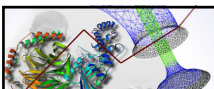


Image credit: Wikicommons

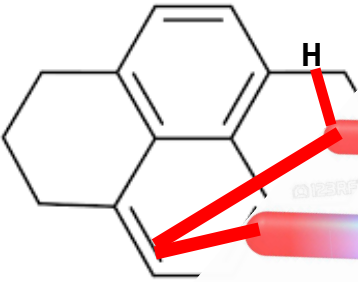
- Why is this oil resistant to radical degradation?

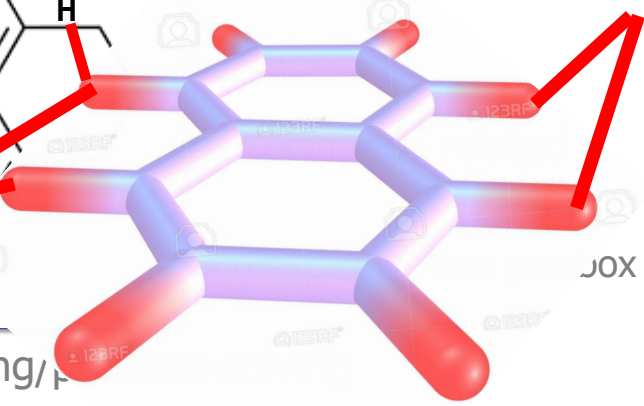
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Working in R&D



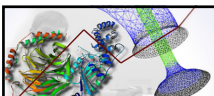


JoX oil

- Trouble-shooting/
- 'We are being sued - a
- nas blown up'

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Problem-solving

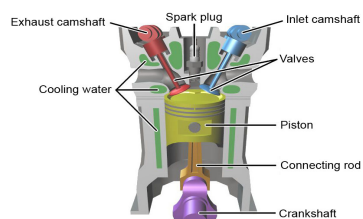
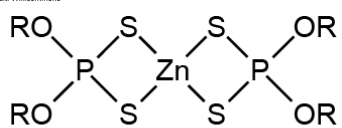


Image credit: Wikicommons



(R = alkyl)

What will happen when acids react with the thiophosphate ester?

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