Preparing for a Career in the Pharmaceutical Industry

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Why Am I Here?

- 37 years in Pharmaceutical Industry in UK, USA and Sweden, managing R&D Departments and Development Projects at Director/Vice-President level
- Background in Cellular Immunology with specialist knowledge of virology, cancer immunology, biopharmaceuticals, autoimmune and respiratory disease
- Independent Consultant in Health-Care & Life Sciences and Mentor for MentLife www.mentlife.se

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Why Work in the Pharmaceutical Industry?

[Drug Manufacturers, Biotech Companies, Manufacturing & Distribution Companies]

Pro's

- Provides a structured career, training and opportunities for self-development and advancement
- Competitive salaries and good terms of employment
- Increasing world-wide demand for new medicines and treatments
- Cutting edge of research with state-of-art facilities and opportunity to impact people's lives and society
- Close teamwork and flexible working environment

Con's

- Unstable organisations with frequent reorganisations and periods of uncertainty
- Decreasing job security and fear of layoffs while companies strive to readjust
- Highly competitive and often high levels of stress
- Decisions are commercially-driven, not scientific. Research freedom perceived as less than in academia
- R&D is long-term and most drugs fail long before getting to market

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Some Statistics

- Global Pharma currently worth $300 bn, rising to $400 bn by 2015
- Market size for pharmaceuticals now exceeds $1 trillion and is growing
- Highly profitable industry, directly employing ~1.5 million people (US and EU)
- Ten largest drug companies have profit margins around 18%
- R&D investments in Pharma industry have consistently outpaced govt. investments in biomedical sciences, with total spend on R&D > $100 bn per annum
- In 2012 Pharma and biotech sectors amounted to 18% of R&D expenditure worldwide with 5 x more money spent on R&D compared to average US manufacturing company

However:

- An industry in transition as Big Pharma companies attempt to **reduce costs** by refocusing investments or by reducing R&D spending
- Expected return from marketing a new drug is now 10% lower than in mid 80's
- In 2013, Roche was only company to spend >$10 bn on R&D. The remaining top 10 companies spent an average of $6.5 bn on R&D - a significant decrease on previous years
- For the first time in its history the US Pharma industry actually reduced total spending in 2012

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Why is the Pharmaceutical Industry Having to Consolidate?

- Put simply – it is not making as much money as it once was!
  - Number of drug-approvals per $bn spend has halved every 9 years since 1950
  - Approval of new medicines remains stable while cost of R&D is rising exponentially
- Why?
  - Altered demographics focusing on hard-to-treat chronic diseases with potential issues around drug safety and superiority
  - Reduction in late-phase clinical success reflecting increased complexity of Phase III/IV studies
  - Critical Patent expirations between 2007-2017 [~$50 bn a year in US sales alone]
  - Shift away from branded drugs to generic and biosimilar medicines
  - High cost of drugs (particularly biopharmaceuticals) in a shrinking and uncertain global economy
  - Increasing demands from governments and payers, including need for comparative efficacy studies, leading to lengthening cycle times
  - Lack of harmonisation within a cautious regulatory environment
  - Questionable R&D model introduced in 1980's with emphasis on technology development at the expense of scientific rigour

A combination of internal and external pressures resulting in an overall decline in R&D productivity

How is the Pharmaceutical Industry Responding?

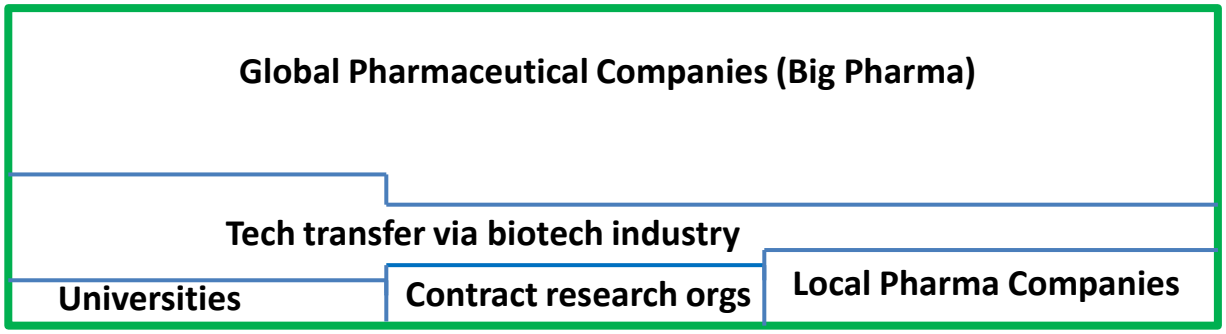
- Increase price of medicines
  - Application of government-imposed price restrictions, especially in Europe
- Reduce R&D spending
  - Use money saved to maximise revenues from existing assets
- Reduce workforce and/or close sites
  - Up to 50,000 positions to be lost over next decade
- Outsource operations (including R&D) to low-cost countries
- Expand in emerging markets (e.g. China) while contracting in established markets, esp. Europe
- Selective mergers and acquisitions
  - Increased diversification into biologics, diagnostics, own-brand generics and risk-sharing partnerships
- Biotech model (small, autonomous units) increasingly applied to Big Pharma R&D
  - Focus on **Research** with value driven by **Intellectual Property**
- Re-focus on biopharmaceuticals at expense of traditional small molecules
  - Is it too early to announce the demise of the medicinal chemist?

Companies responding to similar problems but in different ways

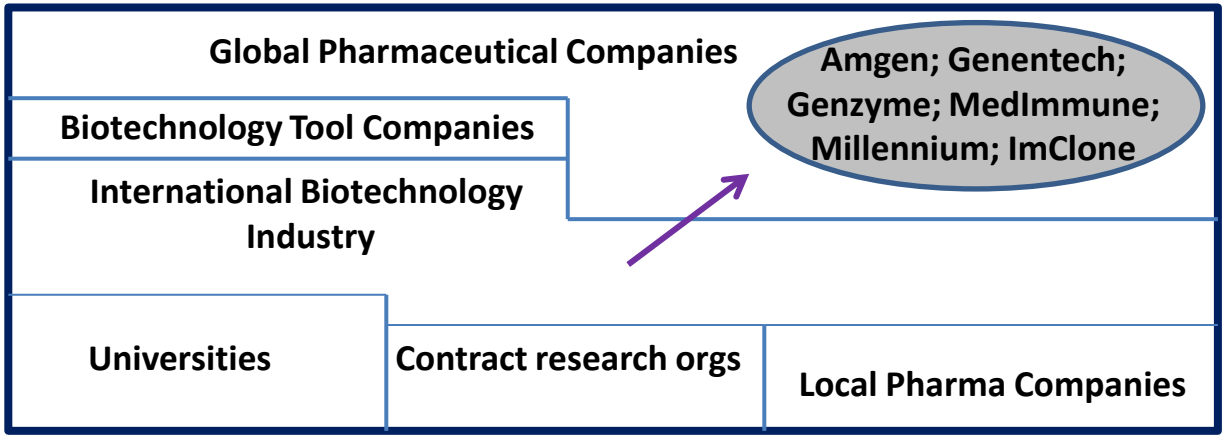
Changes in the Provision of Medicines over the last 30 years

Research Development Sales/Marketing

Pre 2000



2000 - today



Contraction of Big Pharma and Emergence of Biotech Industry

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Modified from Drews J , 1999

The Pharmaceutical Industry remains highly competitive and profitable with the global demand for new and improved medicines increasing. It still needs, and will continue to recruit, high quality post-graduate scientists

It's just getting more difficult!

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Some Differences between Scientific Careers in Industry and Academia

Industry

- Research starts as focused and will be quickly abandoned unless a practical application is identified
- Success is measured by the delivery of tangible assets (transition of compounds through different phases and delivery of new medicines)
- Issued patents often more important than peer-reviewed publications
- Flexibility to embrace other disciplines of scientific research or even move out of science completely
- Opportunity to become a specialist but more limited than in academia
- Collaborative research is an absolute requirement, interdependent and interrelated – MATRIX STRUCTURE

Academia

- Research often starts broad and will then become more focused
- Success is usually measured by scholarly output (publications, awards, positions etc.)
- Opportunity to become a specialist in a restricted area of scientific research
- Research can be collaborative or independent

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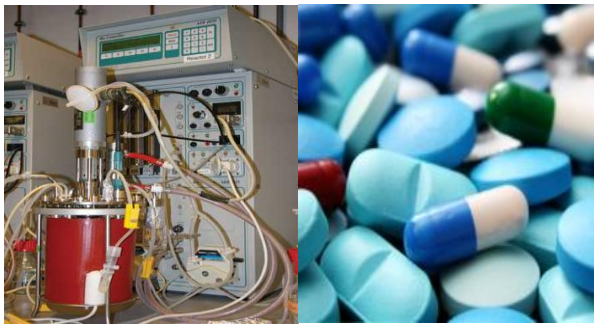
What kind of people are employed in the Pharma and Biotech Industries?

R & D

- **Biology**
  - animal technology
  - DMPK
  - formulation
  - pharmacology
  - toxicology
  - drug safety
  - biotherapeutics
  - immunology
  - cell biology
  - enzymology
  - microbiology
  - genetics
  - biochemistry
  - protein eng/synthesis
  - bioinformatics
  - imaging
- **Chemistry**
  - analytical chemistry
  - chemical technology
  - medicinal chemistry
  - process chemistry
  - computational chemistry
  - physical chemistry
  - crystallography
- **Clinical studies**
  - physicians
  - clinical research associates
  - clinical scientists
  - clinical project managers
  - medical writers

Support roles

- Statistics
- Human Resources
- Finance
- Information Technology
- Archiving
- Patents/Legal
- Regulatory Affairs



Commercial

- Healthcare communications
- Medical information
- Sales and Marketing
- Heath Economics
- Medical reps

Manufacturing & Supply

- Chemical engineer
- Production engineer
- Plant engineer
- Validation engineer
- Pharmacy
- Quality Control & Assurance

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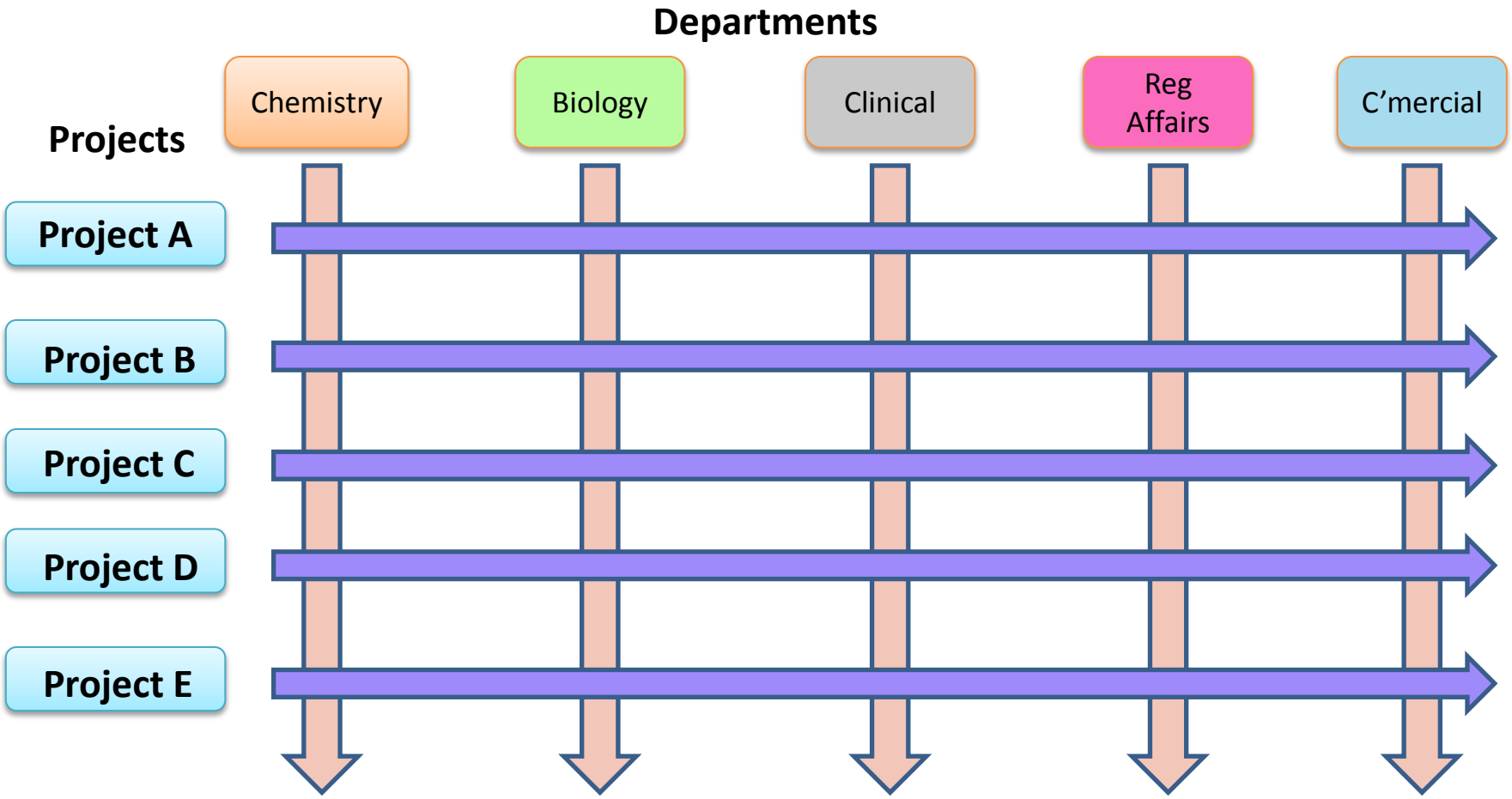
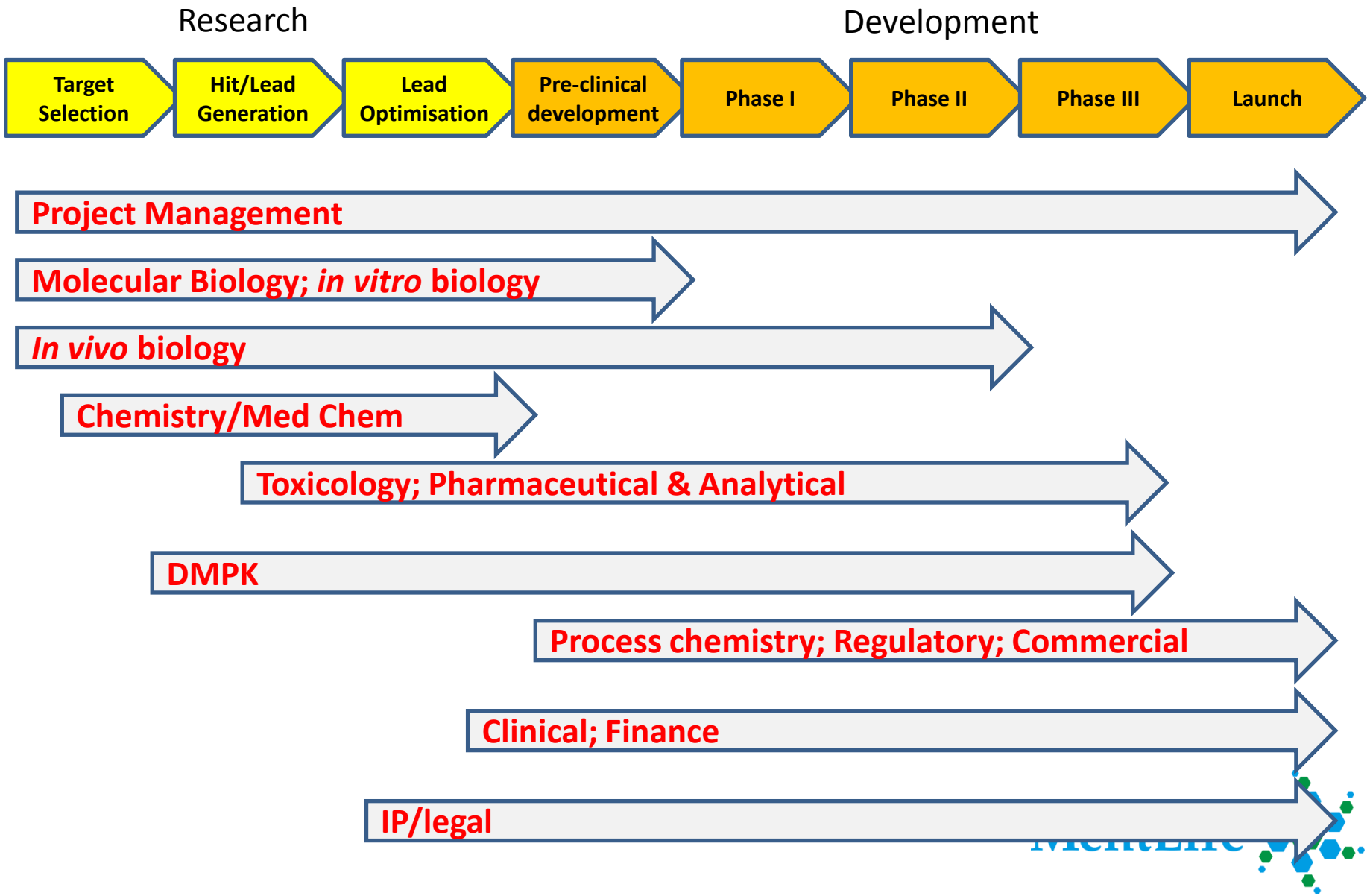
Simplified Matrix Organisation in the Pharmaceutical Industry



<u>Why a matrix organisation?</u>

- **pressure to share limited resources (people, scientific and technical expertise, equipment etc.)**
- **company requires dual output (delivery of new products + development of new skills/technologies)**
- **frequent external changes (uncertainty and lack of long-term stability)**

Skills Required at Each Phase of the Research and Development Process



How Does The Process Work I?

Company Decisions: ethical pharmaceuticals, health care products, generic/biosimilar drugs, small molecules, biopharmaceuticals, vaccines, commercial manufacturing etc.
(CEO and senior management team)

Disease areas: oncology, respiratory disease, infectious disease, autoimmune disease etc.
(scientific, clinical and commercial organisations)

Specific Diseases: prostate cancer, asthma, hepatitis C, rheumatoid arthritis etc.
(Disease Area management teams)

YOU

Disease targets: well/poorly validated; high/low competition; restricted/extensive market; strong/weak patent position; easy/poor tractability etc.
Target Selection: a peer-reviewed bottom-up process

Formation of Project Team

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How Does The Process Work II?

- Project Teams responsible for:
  - Project design and execution; scientific, clinical and commercial validation; ethical approvals and regulatory interactions; timelines; interactions with external partners; resource utilisation; people development; target claims; **final authority (Product Matrix Organisations)**

- Departments responsible for:
  - Resource allocation; scientific training and expertise; individual development and career structures; budgets; recruitment and strategic planning; R&D capabilities; **final authority (Functional Matrix Organisations)**

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How to Prepare for a Career in the Pharma Industry
I The Interview

- Never underestimate importance of preparing for interview
- Interview is a 2-way process. You know why you want the job; do you know what the company wants from you?
- You will be employed to:
  - Do the job as advertised and make a positive contribution to the company's objectives
  - Act as an ambassador for the company
  - Develop within the company and, in competition with others, ultimately assume a position of responsibility and leadership
- Have a realistic career path mapped out in your mind before each interview
  - 2, 5 and 10 years
- Be clear as to why you want to work in pharma industry versus academia
- Be scientifically focused on what needs to be done to progress a project, not what would be nice to do
- Steer clear of criticism and be enthusiastic!
- Follow up letter – more than just 'thank you'
- Ask questions.....

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How to Prepare for a Career in the Pharma Industry
II How to Improve your Chances

- Send CV to companies and ask to be put on their records
- Talk with company scientists at national/international meetings. Get their names
- Get Experience – internships, joint university/industry undergraduate degrees, Collaborative Awards in Science and Engineering for postgraduates, postdoctoral positions in industry
- Use experience already gained – organisation of meetings/symposia, participation in academic-industrial collaborative projects
- Seek out mentors from industry or academic mentors with industry experience
- Work on oral and written communication, particularly if English not first language

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How to Prepare for a Career in the Pharma Industry
III How to Improve your Chances

- What you need to know
  - The drug discovery & development process and where you would fit into this
  - How to work to GMP and GLP (and what these mean)
  - The company you want to work for – past, present and future
  - Differences in motivation between scientists in Industry versus Academia
  - Why broad-based skills are often preferred to specialist skills
- Be flexible – if applying for a position in an international organisation you should have a similar mind-set
- Do you need post-doc training? – no
  - In the US <10% post-docs get tenure and many of the remaining 90% regard a job in industry as a second-best alternative. It isn't!!

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Finally, make sure your CV is up to date, well-structured and relevant

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How to Prepare a CV

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CV or Resumé?

- Curriculum Vitae / Resumé
  - Course of life / Summary
  - Resumés tend to be static, CV's are capable of being modified depending on purpose
  - Resumés are usually shorter (1-2 pages); CV's a bit longer
  - For science-based careers the actual differences between Resumés and CV's can be marginal

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- First of all – many examples on the internet and lots of templates – check them out but usely sparingly and wisely
- This is my take – it's not THE way but A way

An application for a job working for Ludovico il Moro, Duke of Milan, 1482

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Why Do I Need a CV?

- Objective: to get a job interview, after that it's up to you!
- Prospective employer will spend no more than 30 secs looking at your CV and maybe the same time looking at your covering letter – you need to impress, but in the right way
- Get someone who doesn't know what you do to read you CV for 30 secs and then verbally feedback what it says....
- Examples of what I've seen:
  - Covering letter that starts with: 'your search is over, I'm the man for the job'
  - Under interests: drinking with my friends
  - Why work in Pharma?: I'm interested in scientific research and I want you to pay for it

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CV for Academia vs Industry

General Rules

- Emphasis on what you have already achieved
- Focus on scientific credibility
- Extensive and inclusive
- Specialist
- Focus on scientific accomplishments
- Lists publications, presentations, conferences

- Emphasis on how your achievements can be applied
- Focus on skills necessary for the job you are applying for
- Short, sharp and to the point
- Generalist
- Focus on non-scientific accomplishments
- Lists teamwork, communication, leadership

These are not interchangeable

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What to Include I
Basic information

- Contact details
  - Name (large print, top left), private (not university) address, telephone, e-mail
  - Career objectives statement optional
    - If included, should be short and precise
      - ☺ To obtain a full-time position in a global pharma company that utilises my expertise in mass spectrometry
      - ☹ To contribute to the alleviation of global suffering
    - Not needed (in Europe)
      - date of birth, photo, marital status, nationality, gender, references (add reference information in cover letter only if requested)

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What to Include II
Education and Academic Qualifications

- Education
  - List universities attended plus dates
  - Be precise regarding degree(s) gained
  - Add undergraduate modules as relevant
  - Include research projects at BSc/MSc level
- Qualifications gained – can combine education and qualifications

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What to Include III
Experience and Skills

- Professional Experience
  - Include teaching experience and other work experiences and describe responsibilities
  - Skills gained (scientific) – as applied as possible
- Transferable skills (non-scientific)
  - Teamwork, decision-making, communication, working to deadlines, leadership, managing others, resolving conflicts, budgetary responsibilities, problem solving, clear thinking, evidence of creativity, computer and related skills

Employers are usually more interested in your ability to solve scientific (and other) problems than in your specialist knowledge

What do Companies Expect of Applicants

(apart from evidence of scientific knowledge and ability)?

Position A

- Very good degree and a PhD (or about to be awarded a PhD)
- Track record of peer reviewed publications. A record of presenting at scientific meetings is expected
- Track record of pro-activity and creativity which has made an impact on the work of others
- Candidates must be highly proficient in verbal and written English with outstanding communication skills
- A basic understanding of drug discovery and development
- Ability to work effectively within a multidisciplinary team environment
- Scientifically curious with the demonstrated ability to propose and explore new technologies
- Demonstrated ability to effectively work in a team-based environment and mentor less experienced colleagues

Position B

- PhD
- Good analytical and data interpretation skills
- Cooperative and able to work as part of a multidisciplinary team
- Communicative and organisation skills
- Excellent oral and written expression skills
- Drug discovery and development expertise would be beneficial
- Maintaining knowledge of external developments in the field and contributing to and implementing project strategies
- Representing (the company) by presenting at external scientific meetings and authoring publications in peer-reviewed journals

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What do Companies Expect of Applicants?

Medicinal Chemist

- Very good degree and a PhD (or about to be awarded a PhD)
- Track record of peer reviewed publications. A record of presenting at scientific meetings is expected
- Track record of pro-activity and creativity which has made an impact on the work of others
- Candidates must be highly proficient in verbal and written English with outstanding communication skills
- A basic understanding of drug discovery and development
- Ability to work effectively within a multidisciplinary team environment
- Scientifically curious with the demonstrated ability to propose and explore new technologies
- Demonstrated ability to effectively work in a team-based environment and mentor less experienced colleagues

Immunologist

- PhD
- Good analytical and data interpretation skills
- Cooperative and able to work as part of a multidisciplinary team
- Communicative and organisation skills
- Excellent oral and written expression skills
- Drug discovery and development expertise would be beneficial
- Maintaining knowledge of external developments in the field and contributing to and implementing project strategies
- Representing (the company) by presenting at external scientific meetings and authoring publications in peer-reviewed journals

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What to Include IV
Others

- Languages and to what level
- Membership of Societies (care with adding anything to do with religion or politics)
- Publications in refereed journals (include those papers under review)
- Abstracts and Presentations – only most recent and relevant
- Issued Patents
- Books and Book Chapters
- Conferences and Symposia organised
- Conferences and Symposia attended – these will disappear with time and be replaced by: **Invited** Seminars and Symposia
- Honours and Awards
- Personal Interests – not solitary!

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General Information I

- Do not title document – people will know it's a CV
- Categorise with bullets
- Be brief (2-3 pages) but still literate – check spelling
- Everything in reverse chronological order
- Avoid gaps in your history
- Design your own CV – not someone else's as template and modify the CV to reflect the job you are applying for
- Remember – likely to be scanned and subject to keyword search
- Make sure it flows and looks good; less is best
- PDF or e-mail. May need to use company-preferred format so be flexible. Forget conventional mail
- Many people worry about how thin a CV looks. 2 pages is OK. Don't flesh it out

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General Information II

- Don't mislead!! – max penalty up to 10 years in UK
  - Most common is grade inflation
- Get someone to check and feedback
- More important that you demonstrate to a prospective employer what you can do for him/her than what you have done in the past. One of the most difficult tasks is to emphasize the future. Can you anticipate the needs of the company you are applying to and demonstrate how you can contribute to that vision?
- Do homework on company – tedious but essential. If you are a medicinal chemist applying for a job at GSK you should know the structure of amoxycillin – why?
- Employers are investing in you – it will take at least 2 years before you can be considered an asset to a company. Ask yourself, why should they train me and pay me for 2 years without any return?
- Try and use active phrases – lots of 'I' (not usual in science). Especially important in covering letter
- Always include a cover letter along with your CV when applying for a specific job

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END

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