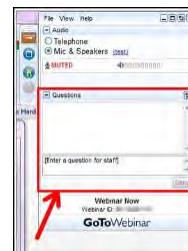




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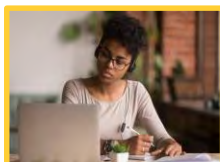
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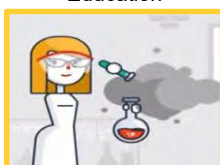
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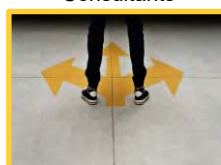
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 Speaker: Selina Wang, University of California, Davis
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- The chemistry of high value oil such as olive oil and avocado oil
- Successes in the olive oil industry's response to adulteration and the current challenges in the avocado oil industry

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Date: Thursday, April 8, 2021 @ 1-2pm ET
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 Moderator: Keith Wing, Keith Wing Consulting

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- The long-term implications of the COVID-19 pandemic and the policy response to it

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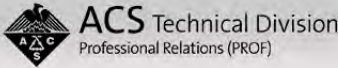
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11



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Formal Synthesis of a Professional Chemist



Matt Grandbois
 Strategic Partnership Manager,
 DuPont Electronics & Industrial



Annabelle Lolingo
 Chemistry Graduate Student, Iowa State University and Diversity,
 Equity, and Inclusion Co-Chair, National Science Policy Network

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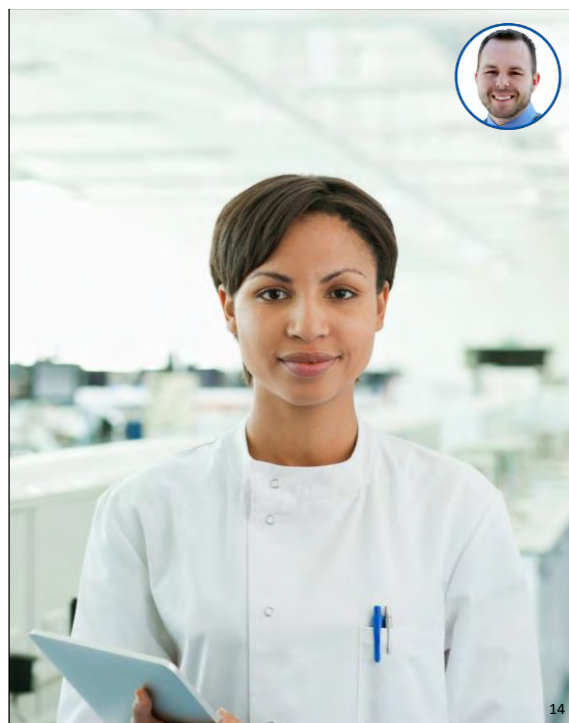
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A Professional Chemist

- Professional chemists (noun) – *engaged scientists trained on and qualified in the practice of chemistry.*
- Found in a variety of occupations ranging from academia, industry, government, and non-traditional.
- Key features and characteristics:
 - Highly adept at applying chemical knowledge to benefit existence
 - Recognizes the utility of both technical data and critical 'soft skills'
 - Chiral entities with numerous contiguous heterogeneities



14

Careers Built On Professional Complexity



- Careers are built by synthesizing a final advanced product from its constituent parts and experiences
- Much like complex total syntheses, there are numerous ways to access your goal whether

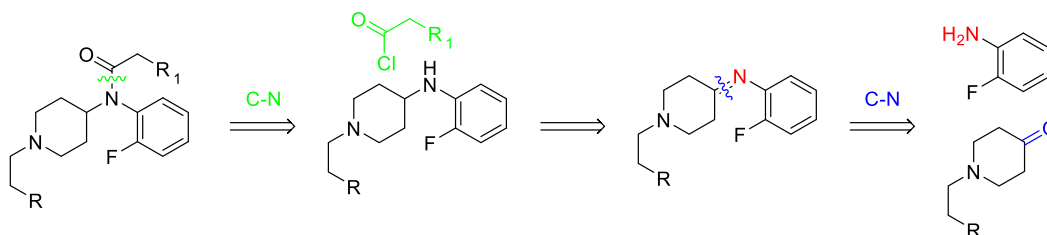
Breaking a career down into smaller pieces makes it more manageable with clearer goals and milestones.

15

Retrosynthesis: Breaking down a Career



- **Retrosynthesis** is a technique utilized by synthetic chemists to develop a strategy for overcoming chemical problems



- Retrosynthetic analysis requires you to sequentially transform your target into simpler precursors that can be combined using well established methods and techniques
- This process continues until an available starting material is identified

16

Audience Survey Question

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



Which E.J. Corey publication formalized the concept of retrosynthesis?

- Enantioselective Chemical Synthesis: Methods, Logic, and Practice
- One Bond, Two Bond, Red Bond, Blue Bond
- The Logic of Chemical Synthesis
- The Chemist: There and Back Again



17



Identification of KSA's



- Successful chemists use **Knowledge, Strengths, and Abilities** (KSA's) to differentiate themselves and achieve their goals
- KSA's are reaction products from experiences earlier in their developmental phases
- Much like *organic functional groups*, KSA's can often be identified by outsider observers
- Identifying KSA's in others and their formative experiences can aid you in developing your own professional development journey

18

KSA's Derive from Prior Experiences



Strong Presentation Skills

- Previous jobs that required significant public speaking
- Numerous speaking engagements at ACS Conferences
- Active membership within speech club or theatre organization



Strong Interpersonal Skills

- Previous jobs that required coalition building
- ACS Leadership Development Series training on communication strategies
- Involved in recruiting programs for work or other organizations



19

KSA's of Successful Professional Chemists

Communication Skills	Creativity
Teamwork/Collaboration	Decision Making
Adaptability/Flexibility	Networking
Problem Solving	Leadership
Critical Observation	Self-Confidence
Conflict Resolution	Acceptance of Criticism
Time Management	Positive Attitude
Work Ethic	Growth Mindset
Patience	Resilience
Influence/Persuasion	Coaching/Coachability



20

Audience Survey Question

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



Which compound was the first natural product ever synthesized from inorganic starting material?

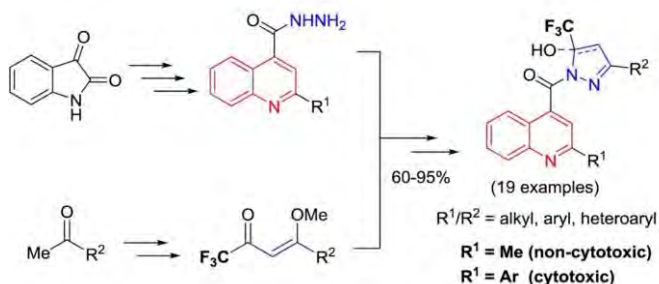
- Caffeine
- Sucralose
- Urea
- Butyl Lithium



Urea was synthesized from inorganic starting materials by Friedrich Wohler in 1828 by treating silver cyanate with ammonium chloride.

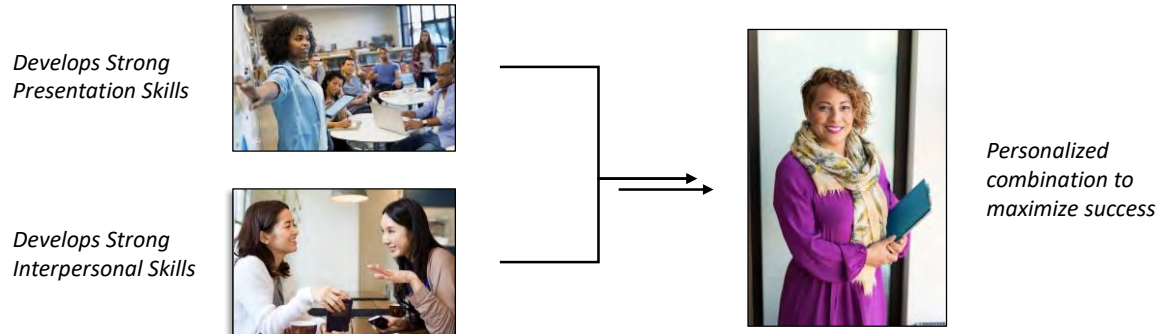
21

Convergent Approach to Career Planning



- Convergent synthetic strategies are used to maximize final yields by combining key elements at a **later stage** of the synthesis
- With a desired target in mind, identify the KSA's you will need to be successful in that future role and their formative experiences

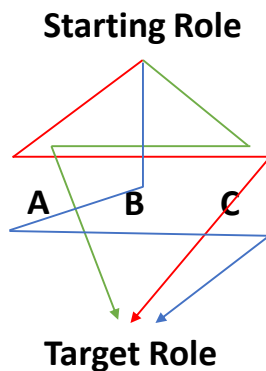
Convergent Approach to Career Planning



- Combining KSAs developed from previous positions allow you to create a unique experience geared toward helping you achieve success
- Layer experiences to include on the job roles, extracurricular activities, specialized education, and individual passions

23

Convergent Strategies Enable Flexible Timing

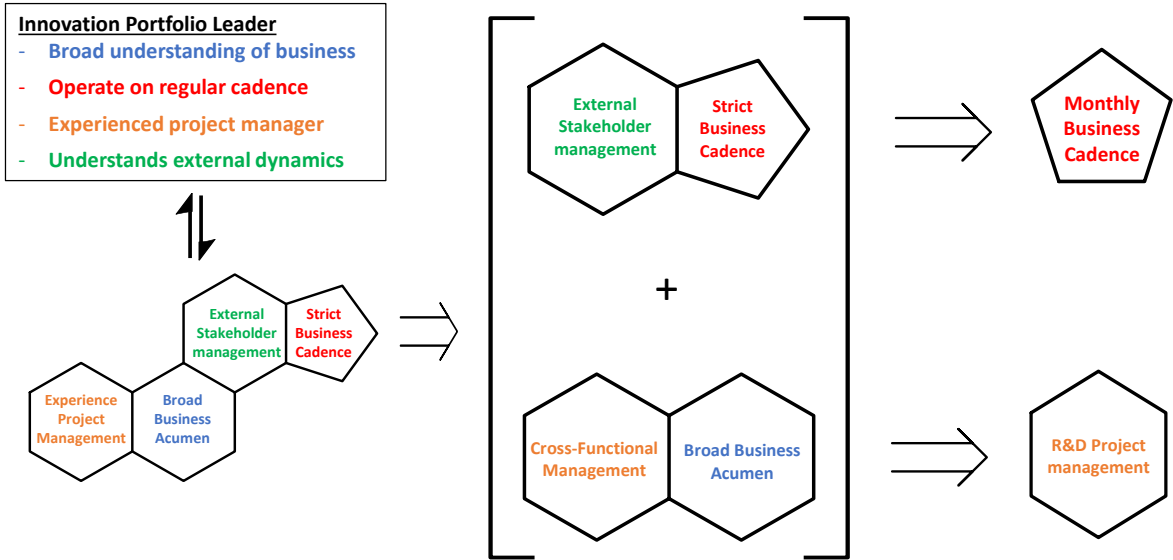


- You may identify more than one KSA needed for a target role is identified
- If this occurs:
 - Establish a **preferred path**
 - Analyze alternative pathways (**#1 & #2**)
 - Recognize progress occurs in many ways
- Conducting a thorough retrosynthetic analysis will help you identify multiple career pathways to help you in the chance you find yourself in a dead end

Path	Role 1	Role 2	Role 3
Preferred Path	A	B	C
Alternate Path #1	B	A	C
Alternate Path #2	C	B	A

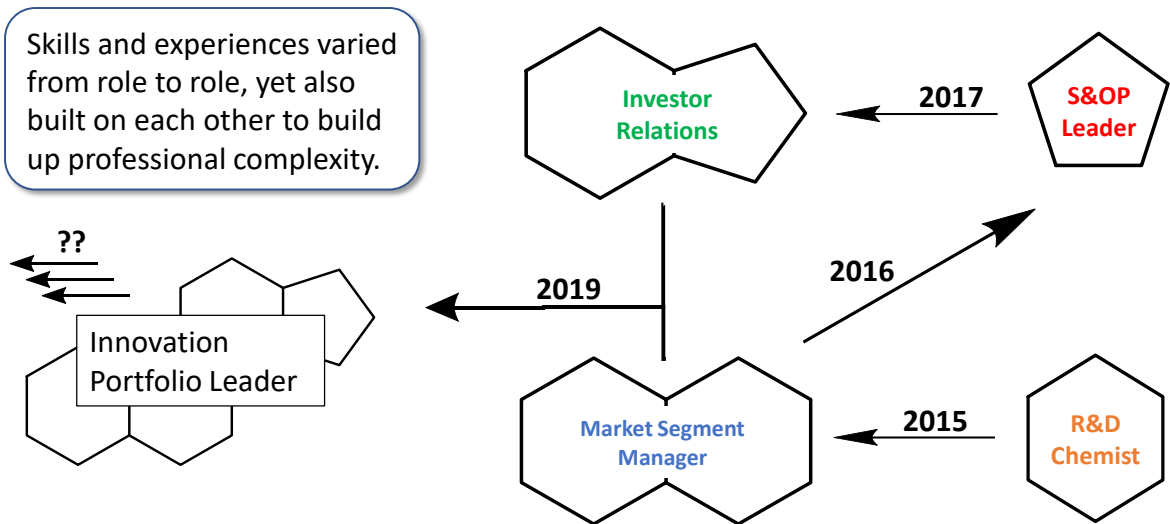
24

Retrosynthetic Example: Innovation Portfolio Leader



25

Formal Convergent Synthesis of an Innovation Portfolio Leader



26

Audience Survey Question

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



Which of the following is NOT a commonly used synthetic strategy?

- Convergent
- Divergent
- Allegiant

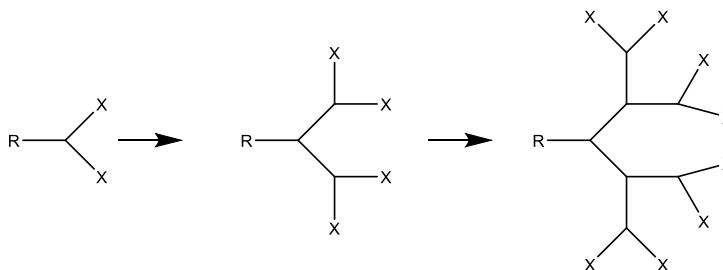


27

Divergent Development Strategies



- Divergent strategies quickly build up complexity through a selective and disciplined approach of increasing potential at every step
- Within a flask, divergent synthesis are a common approach to prepare highly ordered, branched polymeric materials called **dendrimers**

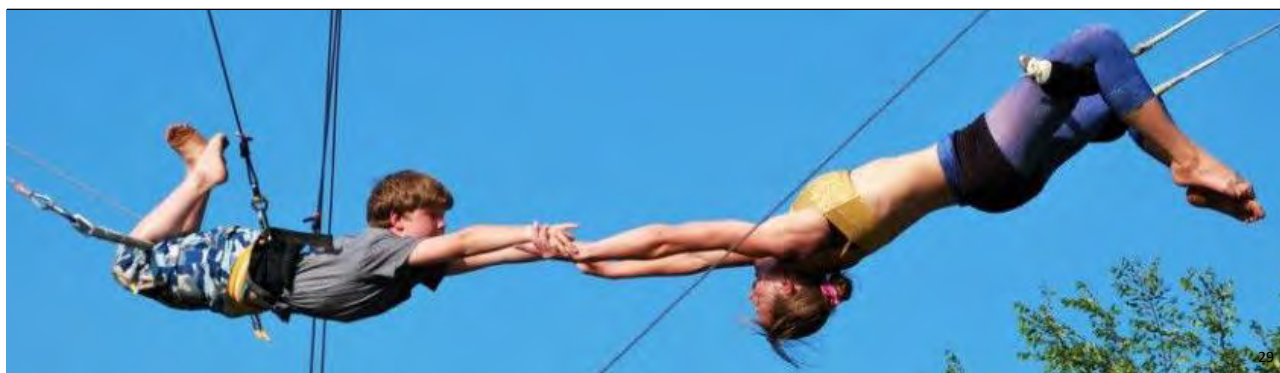


28

Divergent Professional Development



- Divergence helps when you don't know exactly where you're going
- Leverage your strengths to find new opportunities that build on each other
- Development occurs when potential meets experience at just the right time



Convergent vs. Divergent Strategies

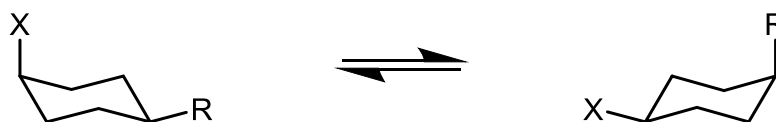


Convergent

- Clear end goal in mind
- May not know your strengths
- Requires planning and strategizing
- Flexible timing for next step

Divergent

- Don't know what you want to be yet
- Good understanding of current strengths
- Requires initiative and patience
- Discovery based learning!





Shifting Strategies



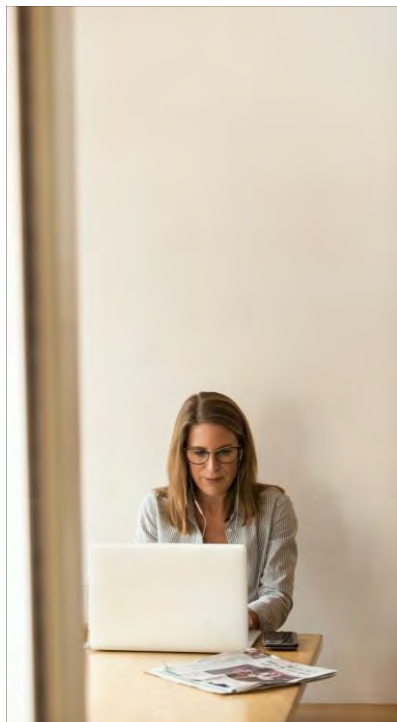
- Choosing a development strategy today doesn't limit your options for the future
- Having the agility to switch between the two may help you achieve your goals:
 - Early in your career, a divergent strategy may help you get out of "analysis paralysis"
 - Late in your career, a divergent strategy may help you achieve progress and find interesting ways to growth
 - Early in your career, a convergent strategy provides focus
 - Late in your career, a convergent strategy brings all the pieces together to coalesce around a unique purpose

31

Formal Synthesis of a Professional Chemist

- The objective of a Total Synthesis is to achieve your target molecule in the most elegant, innovative, and efficient manner
- In Formal Synthesis, the target is an advanced, complex intermediate that can take advantage of learnings from others to achieve your goal
- Each of our career development journeys is as unique as the countless synthetic pathways that fill the annals of organic chemistry
- Whether you have the final target in mind or not, establishing a career development plan that engages and inspires you is the key for success

32



Next Steps & Resources



Next Steps:

- Identify your KSA's as building points
- Conduct retrosynthesis of mentor/goal
- Develop career development plan

Resources:

- ["What I learned"](#) – ACS Industry Matters
- [ACS Leadership Development System](#)
- [ACS Division of Professional Relations](#)
- [ChemIDP](#)


33

Conclusions


- Retrosynthetic analysis techniques can help us develop professional development strategies to help us achieve our career goals
- Divergent and convergent strategies are ways for us to build on existing strengths in order to develop new and complementary ones
- Regardless of where you are in your career journey, the application of professional development strategies can help you achieve success




34



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Formal Synthesis of a Professional Chemist



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Strategic Partnership Manager,
DuPont Electronics & Industrial



Annabelle Lolinco
Chemistry Graduate Student, Iowa State University and Diversity,
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Final Thoughts

- Professional Development occurs whether you intentionally do it or not, so enjoy it!
- There are a million ways to achieve your career goals; just keep focused on the horizon.
- Some pathways result in dead ends, but they are not the end of your path...it's the start of a new chapter!





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 Moderator: Britt Erickson, Chemical & Engineering News

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