Academia-Industry Partnerships

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Dial-a-Molecule ECR Workshop

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A few real stories, with some advice

What you want to do might not be what industry wants

2011: Postdoc/New PI

Allan: "CASE awards should be a bit more collaborative"

GSK contact: "I agree. Lets try something"

Allan: "Cool. I like catalysis"

GSK contact: "We like med chem…"

What do you want to do and is this absolutely critical?

Is what you want to do more or less important than doing something?

What resource do you have? Would you turn resource away?

A few real stories, with some advice

Our medicinal chemistry programme – how it worked out

GSK fund two CASE awards (no studentship attached…) → Leveraged studentships from Department (at a cost…) → Began work on Med. Chem. project in 2013

- Target: LPA antagonists
- No biology resource
- Cold called biologists
- Started small collaboration

→

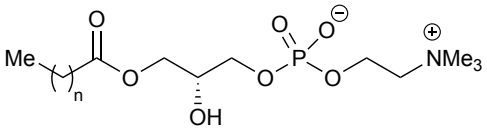
- Discover new chemotype
- Turns out target is terrible
- Need to change direction
- Moved to ATX

Med. Chem. Commun. **2015**, 1149

→

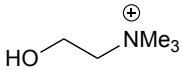
- Target: ATX inhibitors
- No biology resource
- Cold called biologists
- Started good collaboration

J. Med. Chem. **2016**, 5604; *J. Med. Chem.* **2017**, 722
J. Med. Chem. **2017**, 3241; *J. Med. Chem.* **2017**, 2006

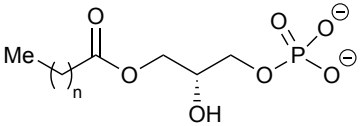


lysophosphatidyl choline (LPC)

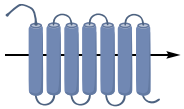
ATX



choline



lysophosphatidic acid (LPA)



$LPA_{1\text{-}6}$

migration
proliferation
survival

A few real stories, with some advice

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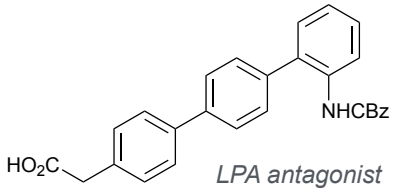
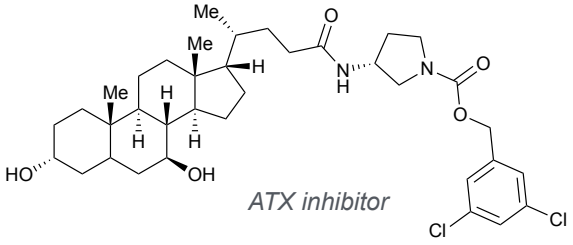
Provided catalysis opportunities…



LPA antagonist

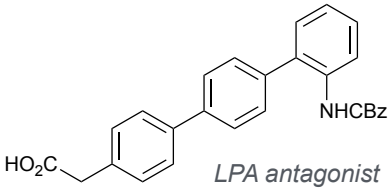


ATX inhibitor

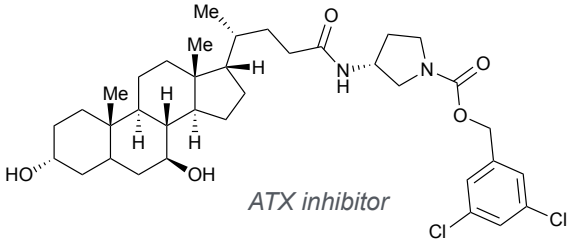
A few real stories, with some advice

The medicinal chemistry enabled our Pd catalysis project

Provided catalysis opportunities…



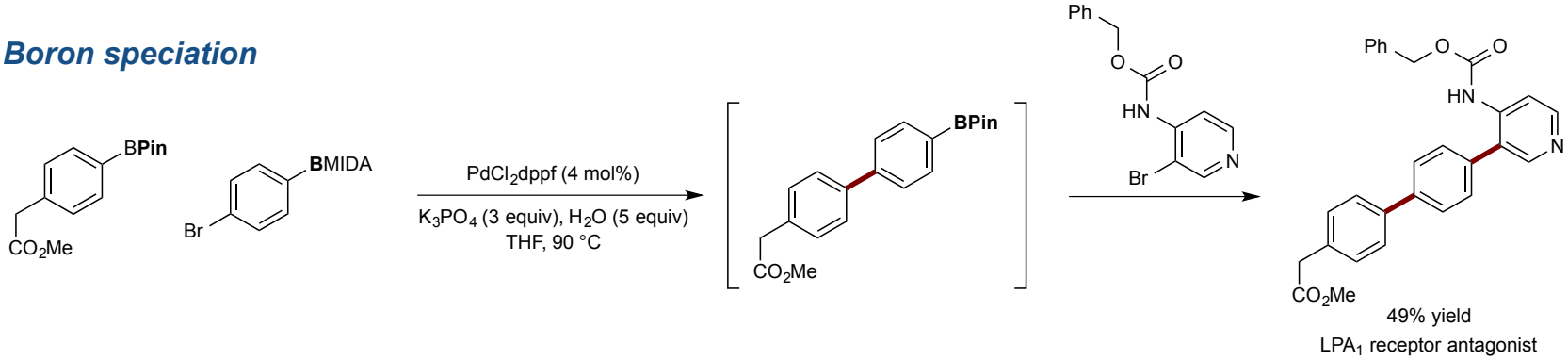
LPA antagonist



ATX inhibitor

We wanted to 'play' with speciation in catalysis…

Boron speciation

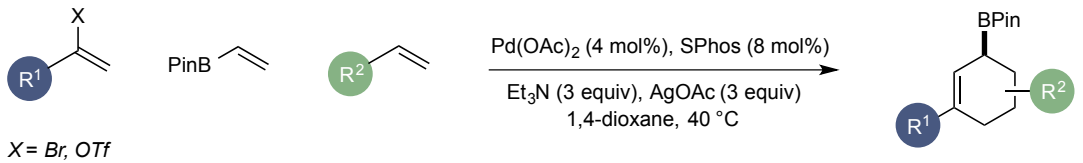


49% yield

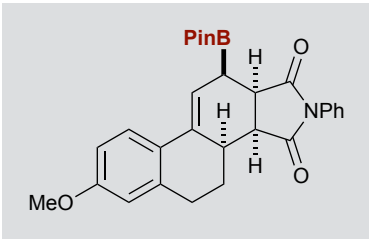
LPA_1 receptor antagonist

ACIE **2017**, 1249
ACIE **2015**, 9976
ACIE **2014**, 12077

Pd(II) speciation



X = Br, OTf



JACS **2018**, 126
Chem. Sci. **2017**, 1551

Ultimately, we were able to do what we wanted to do…just slightly differently

A few real stories, with some advice

You might not know what you want to do
and
You might not know that industry wants this

2014: PI

Glenn Burley: "Hey Allan, you do stuff with metals, right?"

Allan: "Yep"

Glenn: "I have a Chemical Biology problem using copper"

Allan: "Eh, we work with Pd on wee molecules…"

Is what you want to do absolutely fixed?

Is there a way you could look at what you want to do in a different way?

What resource do you have? Would you turn resource away?

A few real stories, with some advice

Our chemical biology programme – how it worked out

Glenn and I had two half studentships (with no consumables) → Made one studentship (via fee waiver) → Began work on Chem. Biol. project in 2015

- Target: Methodology
- CuAAC on novel ynamine
- Glenn had proof of concept

→

- Discover chemoselectivity
- Find odd kinetics
- Turns out its general
- Useful on small molecules

→

- Identify fix to problem
- Target: Proper Chem. Biol.
- Target: Defined therapy

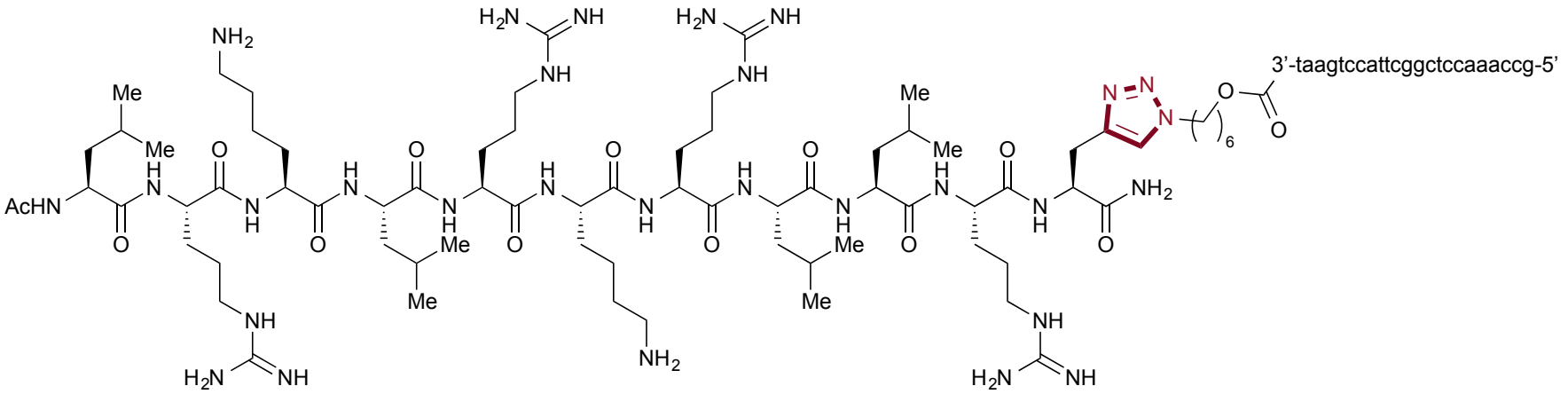
Org. Lett. **2016**, 1694
JOC **2017**, 5461
ACIE **2017**, 56, 3314

Nature Comm. **2018**, 4021

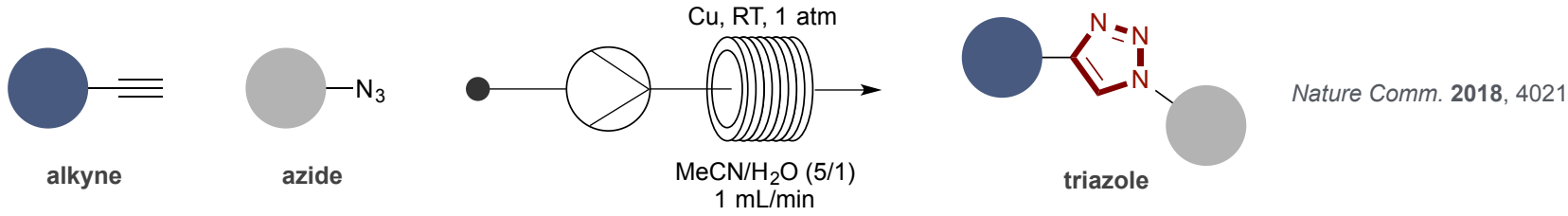
Where does the industry come in?

A few real stories, with some advice

There some molecules that are effective at what they do but can't be made readily…



By understanding the catalysis, we can make them in flow and overcome the problems



Nature Comm. **2018**, 4021

Turns out this has been a challenge for some time…
→ Industry now on board, possible spin out, related work undergoing IP protection

A few real stories, with some advice

Equally, industry might not know what it wants either…

2014: PI

Syngenta: "Think you could make a Chan–Lam work with BPin?"

Allan: "Sure. Probably need to look into mechanism"

Syngenta: "Really? We just need it to work"

Allan: "Best way to do it if you want it fixed…"

Has an industrialist ever highlighted a problem to you?

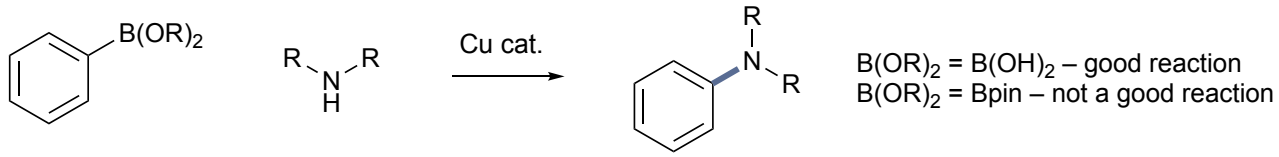
Is it related in any way to what you are doing (or not a million miles away)?

What is the prior art? Is there space?

A few real stories, with some advice

Our Cu catalysis programme – how it worked out

The initial problem



$B(OR)_2$ = $B(OH)_2$ – good reaction
$B(OR)_2$ = Bpin – not a good reaction

No dedicated resource… → **3-month placement student + follow-up part time student (over 15 months)** → **Began work in 2015**

- Target: Methodology
- Solve the problem
- Look at literature and underpinning mechanism

→

- Find simple(ish) solution
- Turns out to be general
- Control reactions give interesting info

JOC **2016**, 3942

→

- Identify gap in mechanism
- Have novel data
- Work up to full project
- Find general approach

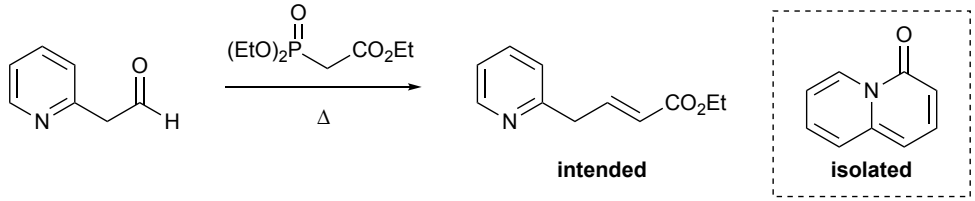
JACS **2017**, 4769
ACS Catal. **2018**, 9560

Syngenta contact: "Wow. I had no idea you took us so seriously"

A few real stories, with some advice

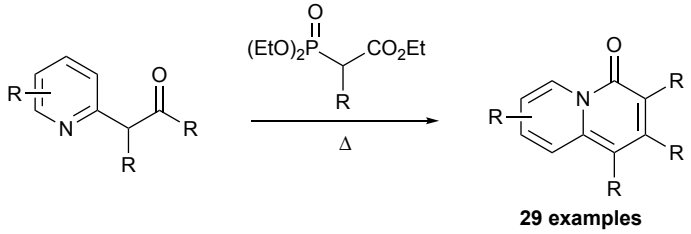
Meaningful doesn't necessarily mean 'big' – what do you both want?

A contact found a byproduct, interesting scaffold for med. chem.



- *Accidental discovery*
- *Related chemistry known*
- *Interesting scaffold for med. chem.*
- *Polar, flat, low logP*
- *Present in natural products and drugs*

We turned it into an MChem project – limited time and resource



Org. Biomol. Chem. **2013**, 3337

Stand-alone MChem project, no follow up, published in OBC, 35 citations so far

Advice??

How to get on board with industry?

- Talk! Go to conferences and listen to what they have to say
- Have a look at what they publish – is it relevant to you? Can you contact the author?
- Be aware that industry are under pressure to cost save
    - FTE time is a consideration
    - Some companies will give out support letters easily, some don't
    - Not sure where 'in kind' support will be in the near future at EPSRC
- CASE awards are great but they are increasingly rare
- Some companies (like AZ) advertise calls, some don't
- Don't be afraid to reach out but don't be offended if you don't hear back
- Be proactive – can you resource a proposed project to start the relationship?
    - What bridging funds are available at your institution?
    - What impact acceleration funds are available at your institution?
    - How often do you engage with your tech transfer office?

A (text-heavy) advice summary

- (Meaningful) collaboration means compromise – flexibility is important
- Collaborations that will last are those where each partner is equally invested

- Do you know what your proposed partner does? Like really? Can you have a dialogue?
- Can you identify areas of common ground either from published calls or papers?
- Be aware that immediate application (ability to deliver) is often what's wanted

- Be aware you might need to fund some initial work to get off the ground

"everyone here is smart and we are good at finding solutions,
its identifying the problem that's the problem"

- Talking to industry is a very good way of identifying problems
- If its a problem for one company, it is probably a problem for others

IMO, project management is paramount to everything