

An illustration of three white, 3D-rendered human figures standing in a circle and shaking hands, symbolizing collaboration. The figures are simple, rounded shapes with no facial features.

Advancing Science in Chemical Process R&D via External Collaborations in Pre-Competitive Space

June 12, 2013, Philadelphia, PA

BI with Academic

BI with other Industry Leaders

- Advance new science
- Economics
- Freedom to operate
- Training and Recruiting

- ✓ UCONN MS and PhD Program
- ✓ With individual professors
- ✓ Joint Seminar Speakers
- ✓ Consultants
- ✓ Interns

- ✓ BI-GSK-Pfizer consortium
- ✓ Green Chemistry Roundtable
- ✓ Pharma IQ consortium
- ✓ API Forum



BI-UCONN MS and PhD Programs

- The program was designed to train highly skilled MS and PhD chemists for pharma industry.
- BI provides funding to support 6 MS students from 2007-2010 and 3 PhD students from 2013-2016.
- A tailored curriculum was created through discussion between UCONN and BI.
 - As part of the curriculum, BI scientists teach a course “BI Lecture Series”.
 - Program capped with a 6-month internship at BI for MS students and a 12-month internship for PhD candidates (in both Med Chem and Chem Dev)
- Intern research at BI has led to high-quality publications, e.g. in JACS and ACIEE.
- The program attracts highly qualified candidates by providing financial aids and unique development opportunities.

New Investigator Awards:

- Established since 1998
- Jump-start careers of new professors.

Contract Research:

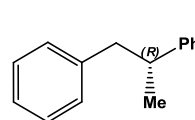
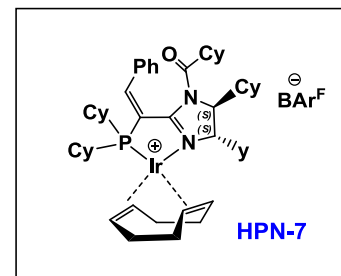
- Collaboration on specific topics related to the need from portfolio.
- Publish results together.
- Recent Example: With Prof. Peter Wipf at the U of Pittsburgh.



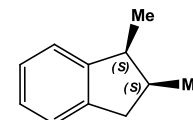
*BI-Pitt Collaboration on
Hydrophosphination
and New Ligand Design*

Unrestricted Grants:

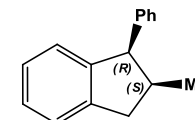
- Provided supports for labs at MIT, Harvard, Yale, Columbia etc.
- Intended to seed high risk, ground-breaking research



95% ee



87% ee



91% ee



BI-Pfizer-GSK Consortium

- ❑ A 3-company consortium was formed to pool resources to drive innovation in critical areas.
- ❑ Advancements from this collaboration will be disclosed in a manner to ensure freedom to operate for all.
- ❑ Opportunities for future GOALI Grant and Research Center with academic collaborators

Computer-Aided Synthetic Design



Cross Couplings
Using Fe, Ni and Cu



Flow Hydrogenation



International Consortium for Innovation and Quality in Pharmaceutical Dev.

- To advance science-based and scientifically-driven standards and regulations for pharma and biotech products
- >25 members from industry
- Strong representation from BI on the Board of Managing Directors



ACS Green Chemistry Pharmaceutical Roundtable

- Partnership between the ACS and pharma to integrate the principles of green chemistry and engineering into drug discovery and production.
- >15 members
- BI actively engaged in RoundTable Initiatives

API GMP Forum

- Purpose of the forum is to benchmark the best GMP practices
- Started in 1998
- Major pharmaceutical companies and several contract manufacturing companies



- Several models for collaboration with academics and other companies.
- Focus on innovation that impacts economics and green chemistry.
- Directly engaged in education/training of next generation of workforce.
- Actively participated in and provided leadership in various consortia.
- Always welcome new opportunities for mutually value-added collaboration.