Scientific ‘Swap Meet’: Pharma Competitors Form Novel Consortium to Share Materials

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Just as an amazing meal often begins with the best ingredients, the most innovative compounds are likely to emerge when scientists have access to diverse and high-quality chemical building blocks.

But what are chemical building blocks? To understand that, first, you should know that one way in which chemists synthesize compounds is by combining smaller compounds. These smaller compounds are sometimes referred to as “building blocks” because they can be used to build larger compounds. Traditionally, chemists working in pharma had access to a limited collection of chemical building blocks. When a certain chemical building block is needed that their company didn’t already have, typically, there are only two options: synthesize it themselves or, if the building block was commercially available, buy it from a commercial supplier. But making a new building block is time intensive and buying it could be expensive, and in both cases, often you ended up with more building block than you need and the extra just gathers dust on a shelf.

Motivated to address this dilemma, Pfizer and Janssen Research & Development conceived of a new approach to provide their chemists with access to novel chemical building blocks — they would exchange the building blocks with each other. To accomplish this, the two companies formed the Building Block Exchange (BBXC) in which each member contributes a set amount of chemical building blocks to be shared by participants in the BBXC. The terms of the BBXC agreement stipulate that it’s a one-for-one exchange. The two companies announced the BBXC in September 2018 and hope to add additional partners in the coming months to increase the diversity of available chemical building blocks.

“We’re exchanging materials like a ‘swap meet’ and providing building blocks that we already have and getting new building blocks that we can use to potentially create new value,” says Sylvie Sakata, Head of External Research Solutions based at Pfizer’s La Jolla, California research site. “We hope to do this broadly and have multiple companies join, because the value is going to come in from the diversity of chemical entities in the exchange,” adds Evan Cooper, Director of Business Development Worldwide Research and Development based at Pfizer’s Groton, Connecticut site.

Value in sharing

As the foundation of new medicines, chemical building blocks are like the “Tinkertoys” we know from childhood. Each building block has a molecular “handle,” that can be attached to other pieces, to build a compound with a specific set of attributes. The higher the diversity of the starting pieces, the more likely you will find a compound that has desired properties. “When our medicinal chemists design novel analogs or libraries of compounds for a target of interest, they want to make sure it has great drug-like properties and can be synthesized from readily available starting materials — and that begins with having diverse building blocks,” says Sakata.

In the past, drug makers were not keen to share their building blocks. It takes a great amount of time and money to amass a sizeable molecular collection, so the historical logic was: why give it away to other companies? In forming the BBXC, the founding members did an analysis and found that there was very little overlap between their chemical building block collections and when Sakata showed some Pfizer scientists the building blocks that Janssen would be contributing to the exchange, they were intrigued. “Our medicinal chemists said ‘wow, they have building blocks in good property space that we would love access for use in designing new compounds,’” says Sakata.

“We recognized the potential value of BBXC right from the first discussions with Pfizer,” says Lieven Meerpoel, global head of Compound Logistics and Analytical Sciences at Janssen R&D. “BBXC opens the door for pre-competitive opportunities with immediate impact on medicinal chemistry.”

Starting point for innovation

With the agreement executed, stakeholders are now seeing the value in sharing foundational materials. “The building blocks are really just starting materials,” says Sakata. “We’re just sharing ingredients at this point that hopefully will create amazing finished products!”

For scientists, innovation happens with how they put the various chemical building blocks together and the final design of the compounds. “Even if you have the same building block, you can use different chemistry and make something totally brand new,” says Sakata.

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