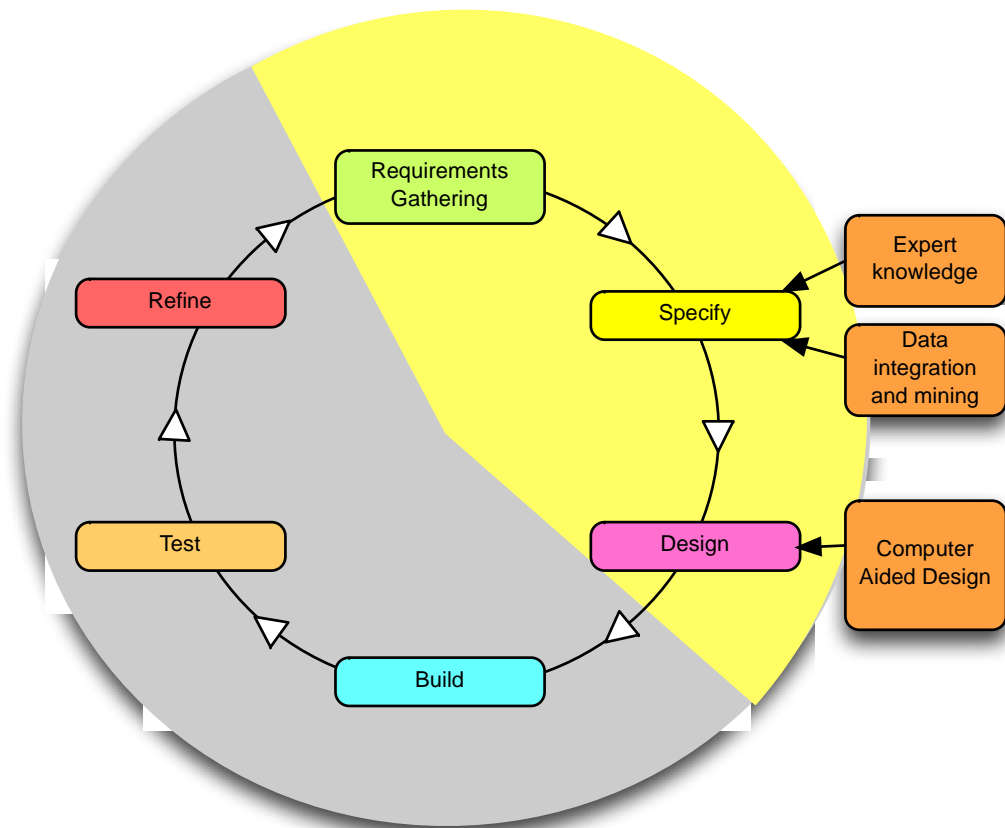


Design and reality in SynBio

Anil Wipat, Newcastle

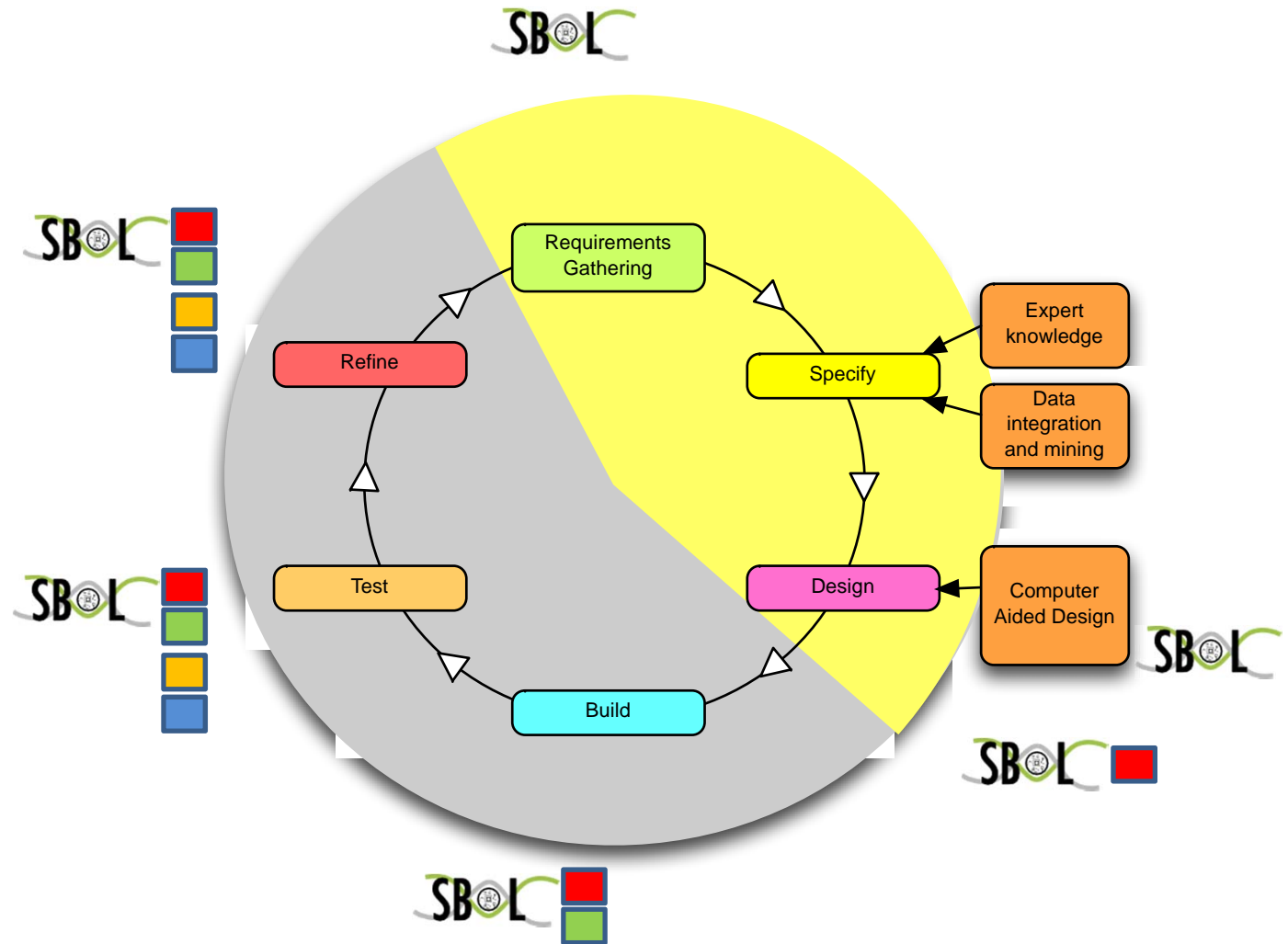
Synbio is an engineering discipline

- Synbio is engineering



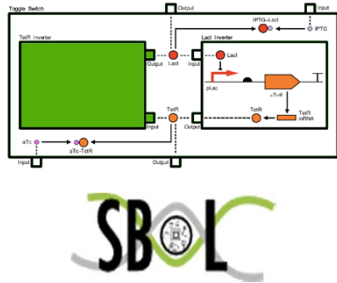
SBOL is not just about design

- An SBOL design specified
- SBOL should be able to travel around the cycle
- Capturing data as it goes

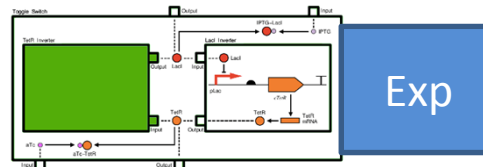


What you want vs what you get

Design

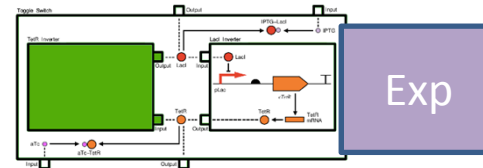


Build and test



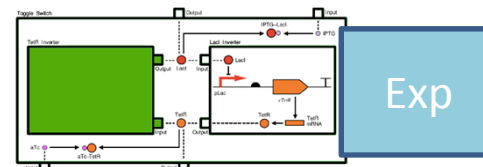
Exp

Lab 1



Exp

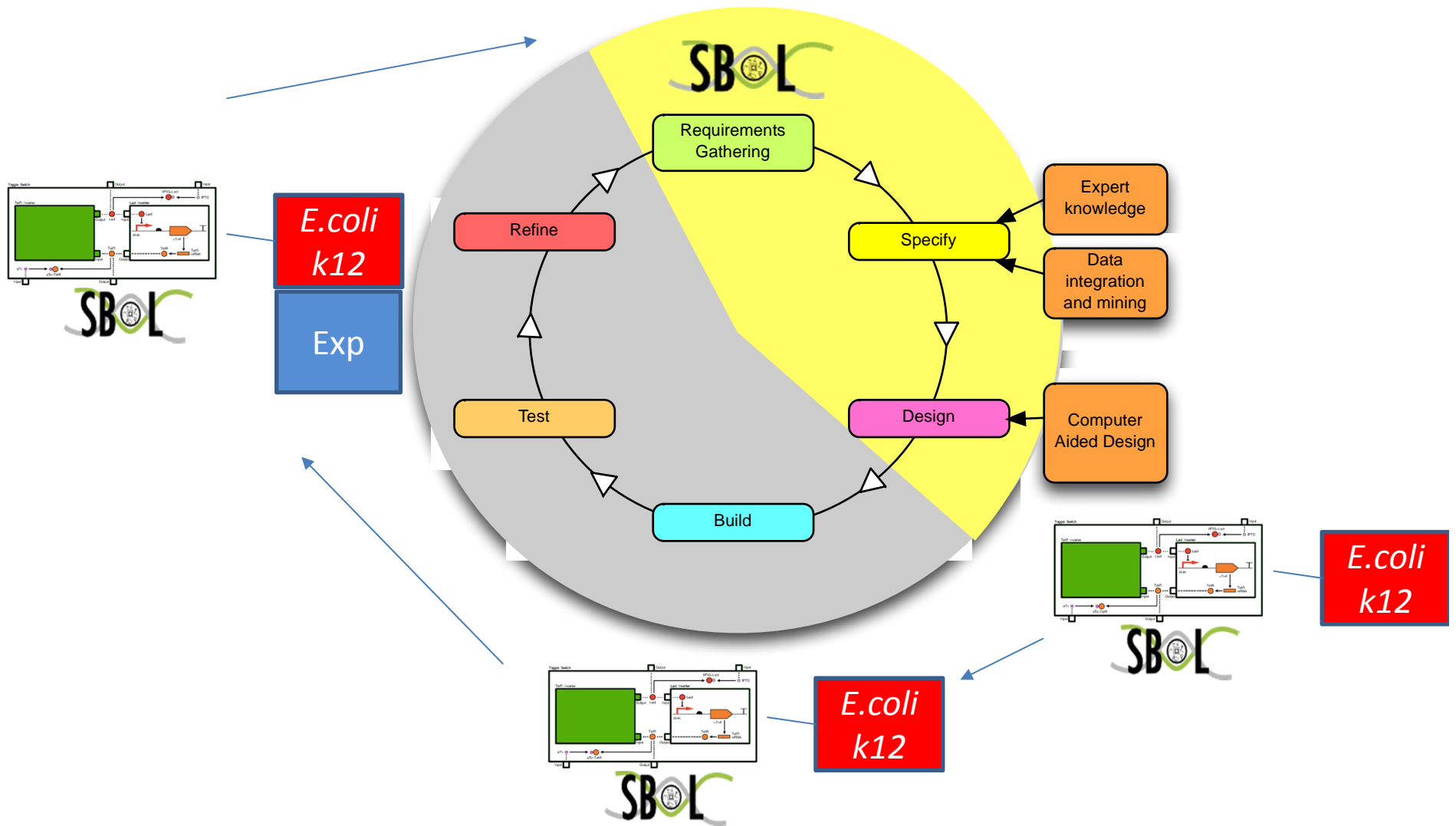
Lab 2



Exp

Lab 3

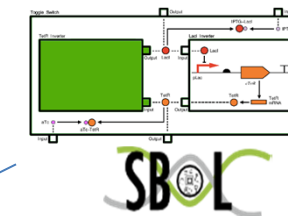
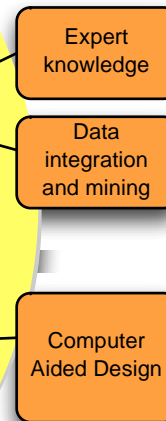
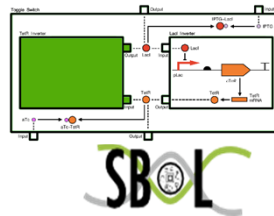
Host context as an example



The diagram illustrates the SBOL (Semantic Biological Object Language) lifecycle, which is a continuous process of refining and building biological models. The process is represented by a circular flow of six stages, each in a colored rounded rectangle, connected by arrows in a clockwise direction:

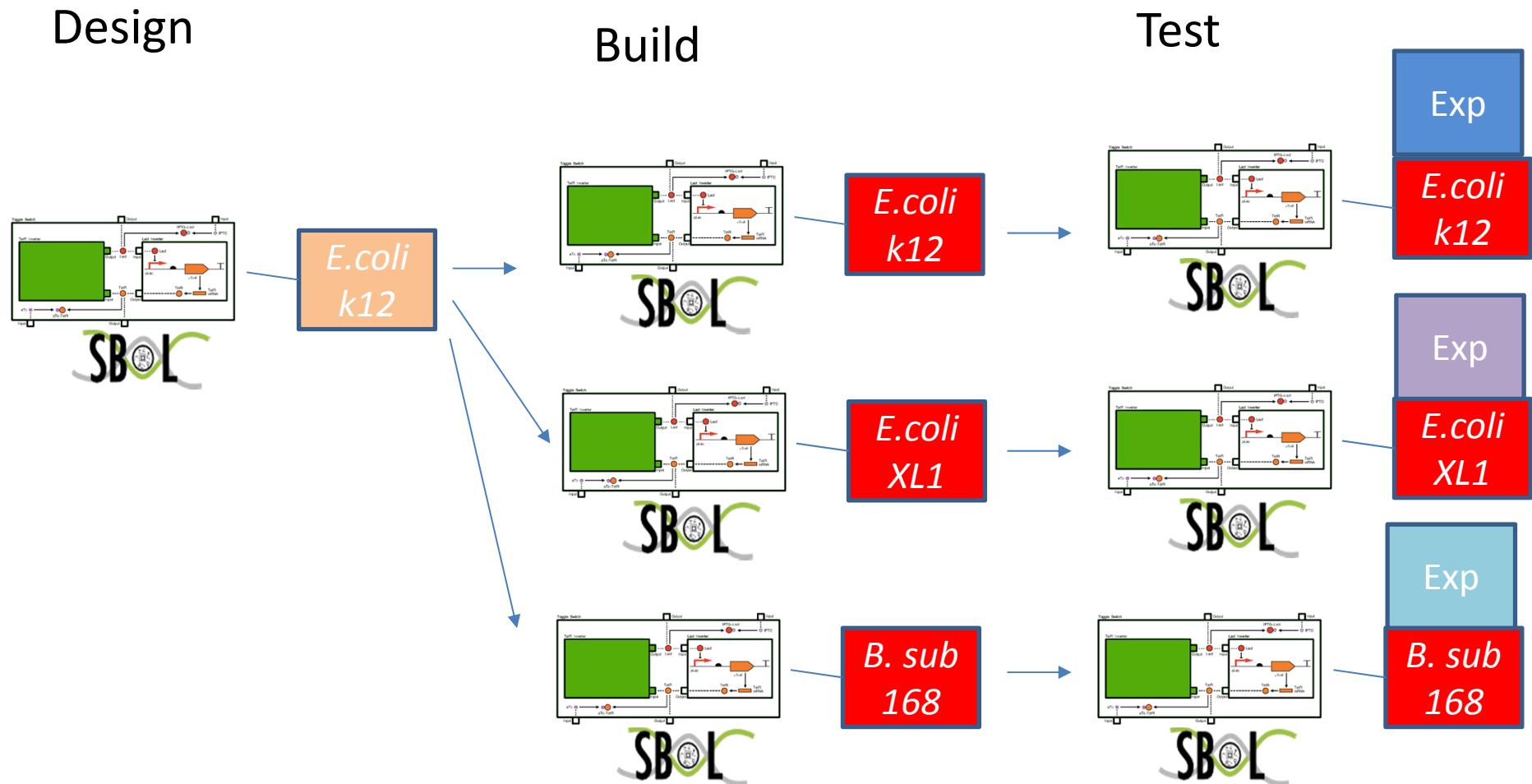
- Requirements Gathering** (Light Green): The initial stage where requirements are collected.
- Specify** (Yellow): The stage where requirements are formalized into specifications. It receives input from **Expert knowledge** and **Data integration and mining**.
- Design** (Pink): The stage where specifications are translated into a design. It receives input from **Computer Aided Design**.
- Build** (Cyan): The stage where the design is implemented into a physical or virtual system.
- Test** (Orange): The stage where the built system is evaluated against requirements.
- Refine** (Red): The stage where test results are used to refine the requirements and specifications, feeding back into the **Specify** stage.

The entire process is set against a circular background divided into two main sections: a yellow section (top right) and a grey section (bottom left). The SBOL logo is positioned at the top of the yellow section. To the left of the main cycle, there are two stacked boxes: a red box labeled *E.coli* x/1 and a purple box labeled Exp. Blue arrows point from these boxes towards the top and bottom of the cycle. In the bottom right corner, there is a small inset diagram showing a complex biological circuit with various components and connections, labeled with terms like 'Design', 'Build', 'Test', and 'Refine'.

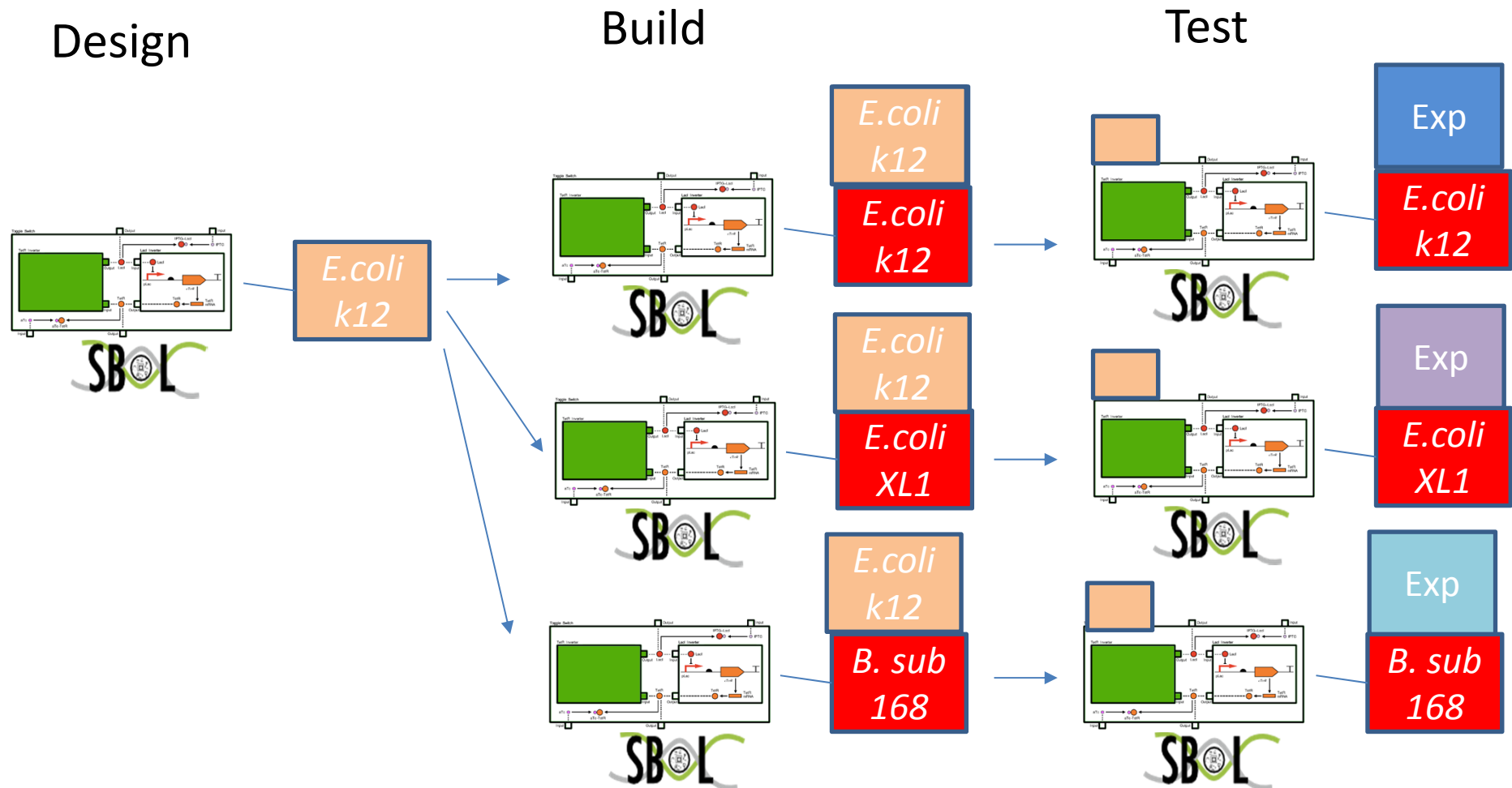


What happens to the original host context?

An SBOL design can be 'built' by many labs and in many ways



An SBOL design can be 'built' by many labs and in many ways



Reasons for sharing SBOL?

- To provide someone with a design so they can build it
 - Doesn't need experimental data attached
- To provide somebody with information about what happened when a design was built
 - Does require experimental data
- Requires two forms of SBOL
 - An SBOL template design (immutable)
 - An instance of an SBOL design