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# Synthetic Biology Open Language (SBOL) Version 2.3

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## Abstract:


Synthetic biology builds upon the techniques and successes of genetics, molecular biology, and metabolic engineering by applying engineering principles to the design of biological systems. The field still faces substantial challenges, including long development times, high rates of failure, and poor reproducibility. One method to ameliorate these problems is to improve the exchange of information about designed systems between laboratories. The synthetic biology open language (SBOL) has been developed as a standard to support the specification and exchange of biological design information in synthetic biology, filling a need not satisfied by other pre-existing standards. This document details version 2.3.0 of SBOL, which builds upon version 2.2.0 published in last year's JIB Standards in Systems Biology special issue. In particular, SBOL 2.3.0 includes means of succinctly representing sequence modifications, such as insertion, deletion, and replacement, an extension to support organization and attachment of experimental data derived from designs, and an extension for describing numerical parameters of design elements. The new version also includes specifying types of synthetic biology activities, unambiguous locations for sequences with multiple encodings, refinement of a number of validation rules, improved figures and examples, and clarification on a number of issues related to the use of external ontology terms.

**Keywords:** Synthetic Biology, Synthetic Biology Open Language, Standards

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