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Sylvia M. Clay · Stephen S. Fong

Developing Biofuel Bioprocesses Using Systems and Synthetic Biology



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Preface

Different fields are often fraught with field-specific terminology and concepts that are loosely defined but used extensively by those active in that field. This is one of the barriers that makes it difficult for someone to learn about a new field of study. In the case of biofuels research and the biofuel industry, there are a vast number of disparate fields that apply to develop a biofuel process. Thus, for someone with interest in biofuels and wishing to become educated on relevant subjects, there may be a long initial period of deciphering terminology and linking concepts.

The intention of this Springer Brief is to provide a broad context of topics relevant to the development of biofuel processes. In particular, emphasis will be given to the recent fields of systems biology and synthetic biology as they relate to biological engineering. The content is meant to start by providing general introductory material into each of these fields and progress with more detail on concepts and methods culminating in highlighted research progress in systems biology and synthetic biology with relevance to biofuels.

Part of the broader context and content of this Springer Brief are focused on the general problem of scientific or technological decision making. While this may sound like an obvious and intuitive component that does not merit discussion, there remains a problem that biofuels impact so many different aspects that there are variety of different decisions to be made ranging from scientific research decisions to governmental policy decisions. Through this spectrum, any of the decisions can impact the speed and efficacy with which viable biofuel production processes may be developed and thus, it seems necessary to discuss explicitly some of the considerations that should be accounted for in developing a biofuel process.

Overall, we hope that this text will be useful to a broad range of readers and provide a broad sampling of material to provide a general perspective on the changing approaches to biological engineering while also providing sufficient examples to show relevance and progress in biofuel research.

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