

*ADVANCES IN*  
**APPLIED MICROBIOLOGY**

VOLUME 111

GOD/A  
04



# Contents

<i>Contributors</i>	<i>vii</i>
<b>1. Genetic engineering for enhanced productivity in bioelectrochemical systems</b>	<b>1</b>
Laura-Alina Philipp, Miriam Edel, and Johannes Gescher	
1. Introduction	2
2. Genetic engineering on different levels	7
3. Conclusion and future outlook	25
References	26
<b>2. Engineering transport systems for microbial production</b>	<b>33</b>
Moses Onyeabor, Rodrigo Martinez, Gavin Kurgan, and Xuan Wang	
1. Microbial transport systems	34
2. Characterization and optimization of microbial transport systems for bioproduction	40
3. Engineering microbial efflux systems to enhance cellular robustness and microbial production	57
4. Future directions for transporter engineering	66
Acknowledgments	70
References	70
<b>3. Yeasts for low input winemaking: Microbial terroir and flavor differentiation</b>	<b>89</b>
Francisco Carrau, Eduardo Boido, and David Ramey	
1. Introduction	90
2. Low input winemaking technology	93
3. Microbial terroir and native yeasts	96
4. The alternative: Spontaneous fermentation and non- <i>Saccharomyces</i> strains	104
5. Other application of non- <i>Saccharomyces</i> yeasts for low input winemaking	106
6. Natural clarification and minimal manipulation before bottling	110
7. Concluding remarks	112
Acknowledgments	114
References	114

---

<b>4. Advances in the control of phytopathogenic fungi that infect crops through their root system</b>	<b>123</b>
Juan José R. Coque, José Manuel Álvarez-Pérez, Rebeca Cobos, Sandra González-García, Ana M. Ibáñez, Alba Díez Galán, and Carla Calvo-Peña	
1. Introduction	124
2. Soil-borne phytopathogenic fungi infecting plants through their root system	125
3. Control of fungal infections through the root system	130
4. Strategies for the application and/or introduction of biocontrol agents, or antifungal compounds, into the root system	147
5. Modeling the rhizosphere microbiome for controlling fungal infections	158
Acknowledgments	161
References	161