DOI 10.1007/s12033-011-9448-9

# A Discussion of Molecular Biology Methods for Protein Engineering

Alexander Zawaira • Anil Pooran • Samantha Barichievy • Denis Chopera

#### **ABSTRACT**

A number of molecular biology techniques are available to generate variants from a particular start gene for eventual protein expression. We discuss the basic principles of these methods in a repertoire that may be used to achieve the elemental steps in protein engineering. These include site-directed, deletion and insertion mutagenesis. We provide detailed case studies, drawn from our own experiences, packaged together with conceptual discussions and include an analysis of the techniques presented with regards to their uses in protein engineering.

### A. Zawaira S. Barichievy

Gene Expression and Biophysics Group, Synthetic Biology–ERA, Building 20, CSIR Biosciences, Meiring Naude Road, Brummeria, Pretoria 0001, South Africa e-mail: azawaira@gmail.com; azawaira@yahoo.com

## A. Pooran

Department of Medicine, Lung Infection and Immunity Unit, Division of Pulmonology, University of Cape Town Lung Institute, Observatory, Cape Town 7925, South Africa

## D. Chopera

Division of Medical Virology, Institute for Infectious Disease and Molecular Medicine, Faculty of Health Sciences, University of Cape Town, Observatory, Cape Town 7925, South Africa

Published online: 30 September 2011