

# CFTR: cystic fibrosis and beyond

- Marcus A. Mall, Dept of Translational Pulmonology, Translational Lung Research Center Heidelberg (TLRC), University of Heidelberg, Im Neuenheimer Feld 350, 69120 Heidelberg, Germany. E-mail, [Marcus.Mall@med.uni-heidelberg.de](mailto:Marcus.Mall@med.uni-heidelberg.de)

## Abstract

Cystic fibrosis (CF) remains the most common fatal hereditary lung disease. The discovery of the cystic fibrosis transmembrane conductance regulator (*CFTR*) gene 25 years ago set the stage for: 1) unravelling the molecular and cellular basis of CF lung disease; 2) the generation of animal models to study *in vivo* pathogenesis; and 3) the development of mutation-specific therapies that are now becoming available for a subgroup of patients with CF. This article highlights major advances in our understanding of how *CFTR* dysfunction causes chronic mucus obstruction, neutrophilic inflammation and bacterial infection in CF airways. Furthermore, we focus on recent breakthroughs and remaining challenges of novel therapies targeting the basic CF defect, and discuss the next steps to be taken to make disease-modifying therapies available to a larger group of patients with CF, including those carrying the most common mutation  $\Delta F508$ -*CFTR*. Finally, we will summarise emerging evidence indicating that acquired *CFTR* dysfunction may be implicated in the pathogenesis of chronic obstructive pulmonary disease, suggesting that lessons learned from CF may be applicable to common airway diseases associated with mucus plugging.