Azurin from *Pseudomonas aeruginosa*: a well designed drug candidate. The drug industry primarily has relied on drugs that target a single gene or enzyme in a pathway involved in disease progression with the idea that such a drug will have minimum side effects and maximal efficacy. Recent observations, however, indicate that a drug that has multiple targets, thus exhibiting promiscuity, is often more efficacious. Recent studies with pathogenic bacteria demonstrate that such bacteria produce redox proteins that appear to act as weapons against various invaders of human body that cause diseases such as cancers, malaria or AIDS. The potential of finding such promiscuous bacterial proteins may lead in the future to an antibiotic-like industry targeted towards non-prokaryotic agents of human diseases.