Introduction

During the whole experiment two different strains of *Eschirichia coli* was use. In detail this were the Top10 and the JM101 strains. The first strain is best suited for gene manipulation experiments and the second strain for industrial production, especially the growth on minimal medium (M9). Thus the first experiments were done in Top10 and later transferred into the second strain. A plasmid was taken containing a resistance to the antibiotic Ampicillin and containing a version of the uvGFP (green fluorescent protein) coding gene. With site directed mutagenesis this GFP gene was changed and later transferred into e.coli, resulting in a theoretic total of 262’000 mutated versions. The mutagenesis worked with pre-produced primes with random bases in a certain part of the sequence, which were used in a PCR run in which many different versions of the GFP were produced. For transferring the plasmids into the cells they were made competent, which means in detail that they were treated with Rubidium and a quick heat shock of 42°C. The analysis of the GFP mutant carrying e.coli was done with uv and blue light fluorescence and the bacteria with highest visible fluorescence under visible light were chosen. The more detailed analysis later involved the use of DNA-sequencing, restriction mapping with EcoRI, EcoRV and HindIII separated with Agarose gel electrophoresis. The small scale GFP production was observed with SDS-PAGE.