

## Gene Expression and Staining Agents: Exploring the Factors That Influence the Electrophoretic Properties of Fluorescent Proteins

**Authors :** Elif Tugce Aksun Tumerkan, Chris Lowe, Hannah Krupa

**Abstract :** Fluorescent proteins are self-sufficient in forming chromophores with a visible wavelength from 3 amino acids sequence within their own polypeptide structure. This chromophore - a molecule that absorbs a photon of light and exhibits an energy transition equal to the energy of the absorbed photon. Fluorescent proteins (FPs) consisted of a chain of 238 amino acid residues and composed of 11 beta strands shaped in a cylinder surrounding an alpha helix structure. A better understanding of the system of the chromospheres and the increasing advance in protein engineering in recent years, the properties of FPs offers the potential for new applications. They have used sensors and probes in molecular biology and cell-based research that giving a chance to observe these FPs tagged cell localization, structural variation and movement. For clarifying functional uses of fluorescent proteins, electrophoretic properties of these proteins are one of the most important parameters. Sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) analysis is used for determining electrophoretic properties commonly. While there are many techniques are used for determining the functionality of protein-based research, SDS-PAGE analysis can only provide a molecular level assessment of the proteolytic fragments. Before SDS-PAGE analysis, fluorescent proteins need to successfully purified. Due to directly purification of the target, FPs is difficult from the animal, gene expression is commonly used which must be done by transformation with the plasmid. Furthermore, used gel within electrophoresis and staining agents properties have a key role. In this review, the different factors that have the impact on the electrophoretic properties of fluorescent proteins explored. Fluorescent protein separation and purification are the essential steps before electrophoresis that should be done very carefully. For protein purification, gene expression process and following steps have a significant function. For successful gene expression, the properties of selected bacteria for expression, used plasmid are essential. Each bacteria has own characteristics which are very sensitive to gene expression, also used procedure is the important factor for fluorescent protein expression. Another important factors are gel formula and used staining agents. Gel formula has an effect on the specific proteins mobilization and staining with correct agents is a key step for visualization of electrophoretic bands of protein. Visuality of proteins can be changed depending on staining reagents. Apparently, this review has emphasized that gene expression and purification have a stronger effect than electrophoresis protocol and staining agents.

**Keywords :** cell biology, gene expression, staining agents, SDS-page

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