Selection of Green Fluorescent Protein and mCherry Nanobodies Using the Yeast Surface Display Method

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Abstract : The yeast surface display (YSD) technique enables the expression of proteins on yeast cell surfaces, facilitating the identification and isolation of proteins with targeted binding properties, such as nanobodies. Nanobodies, derived from camelid species, are single-domain antibody fragments renowned for their high affinity and specificity towards target proteins, making them valuable in research and potentially in therapeutics. Their advantages include a compact size (~15 kDa), robust stability, and the ability to target challenging epitopes. The project endeavors to establish and validate a platform for producing Green Fluorescent Protein (GFP) and mCherry nanobodies using the yeast surface display method. mCherry, a prevalent red fluorescent protein sourced from coral species, is commonly utilized as a genetic marker in biological studies due to its vibrant red fluorescence. The GFP-nanobody, a single variable domain of heavy-chain antibodies (VHH), exhibits specific binding to GFP, offering a potent means for isolating and engineering fluorescent protein fusions across various biological research domains. Both GFP and mCherry nanobodies find specific utility in cellular imaging and protein analysis applications.

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