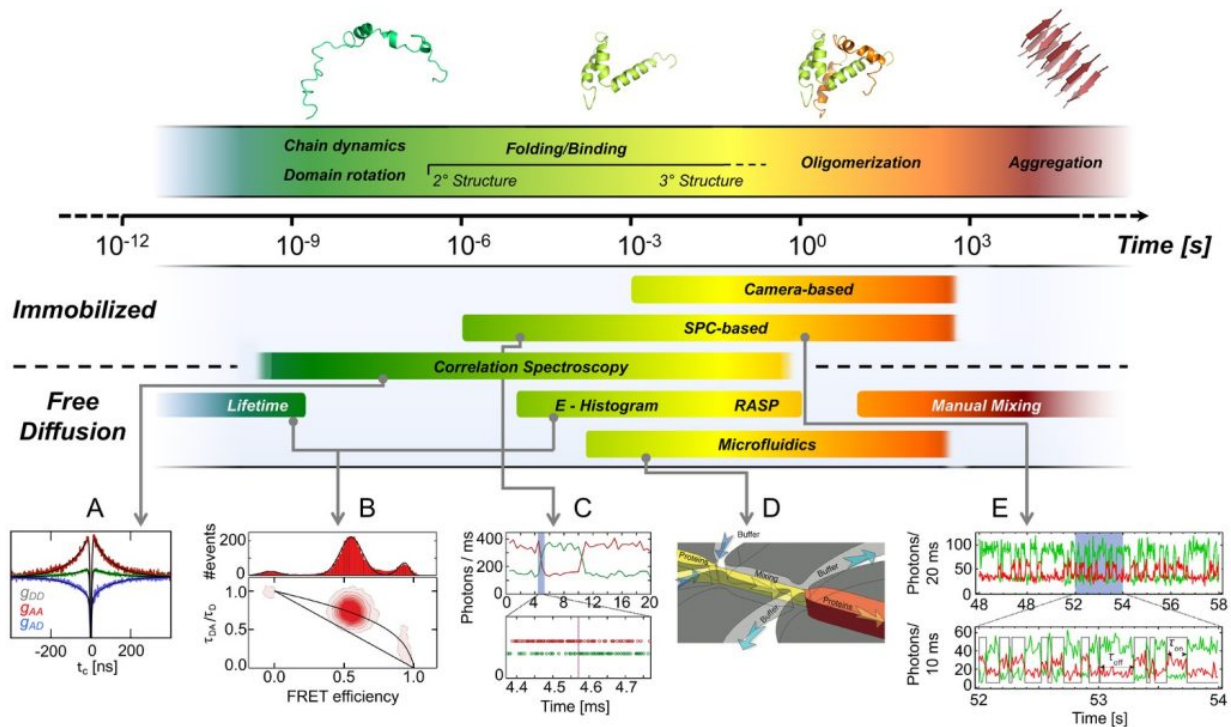


FRET-based dynamic structural biology: Challenges, perspectives and an appeal for open-science practices



Single-molecule FRET (smFRET) has become a mainstream technique for studying biomolecular structural dynamics. The rapid and wide adoption of smFRET experiments by an ever-increasing number of groups has generated significant progress in sample preparation, measurement procedures, data analysis, algorithms and documentation. Several labs that employ smFRET approaches have joined forces to inform the smFRET community about streamlining how to perform experiments and analyze results for obtaining quantitative information on biomolecular structure and dynamics. The recent efforts include blind tests to assess the accuracy and the precision of smFRET experiments among different labs using various procedures. These multi-lab studies have led to the development of smFRET procedures and documentation, which are important when submitting entries into the archiving system for integrative structure models, PDB-Dev. This position paper describes the current ‘state of the art’ from different perspectives, points to unresolved methodological issues for quantitative structural studies, provides a set of ‘soft recommendations’ about which an emerging consensus exists, and lists openly available resources for newcomers and seasoned practitioners. To make further progress, we strongly encourage ‘open science’ practices.