Supramolecular protein structures have emerged as potential platforms for novel phototherapy applications.In recent years, advancements have been made in the development of supramolecular protein drugs as biomaterials due to their extensive utility in the design of highly controllable and functional materials for use in drug delivery, therapeutically relevant payload, antitumor therapy, regenerative medicine, and other biomedical applications.These customizable structures provide distinct benefits for targeted drugs delivery and imaging-guided treatment. Protein supramolecular structures are being investigated by researchers in the area in order to build revolutionary phototherapeutic platforms that combine light-sensitive molecules with the selective targeting and controlled release capabilities of proteins. By harnessing the unique features of protein supramolecular complexes in response to light stimuli, this technique has enormous potential for precise and localised therapy of different illnesses, including cancer. Future research in this field is likely to open up new avenues for effective and personalised phototherapy techniques.We expect more supramolecular techniques to enter clinical practice in the future years, proving the toolbox's disease-treating potential.