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Developing high sensitivity/specificity detections systems for proteomic studies using Adhirons coupled with fluorescence for studying protein interactions.

Protein interactions are at the heart of nearly all disease states identifying and characterising these interactions has led to the development of biological tools to expedite research in this area. This paper aims to present a review of the multiple types of interactions and the medley of biological tools employed in the study of proteomics.

Established methodologies employed to monitor in-vivo and in-vitro protein interactions have identified multiple types of interactions ranging from heterocomplexes to homocomplexes, obligate and non-obligate to transient and permanent interactions. However the drawback with current studies is that they are restricted to a limited number of interactions and fail to elucidate networks of interactions which are important in understanding the basis of disease and in particular cancer, a disease caused by aberrant signalling along complex pathways.

The diverse array of biological tools range from mass spectrometry, yeast-two hybrid, to techniques such as Fluorescence Resonance Energy Transfer (FRET) and Bioluminescence Resonance Energy Transfer (BRET). Biological fluorescence/luminescence approaches have been successful in providing spatiotemporal data of protein-protein interactions in live cells. In addition non-scaffold proteins such as Adhirons, DARPins and Repebodies have also been used with some success.

The study aims to take the use of Adhirons a step further by adapting them for use with fluorescence tools such as FRET techniques and to identify not just single interactions but networks of protein interactions by exploiting DNA paint. The journey into proteomics has already begun and at the present juncture has reached a significant milestone.

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