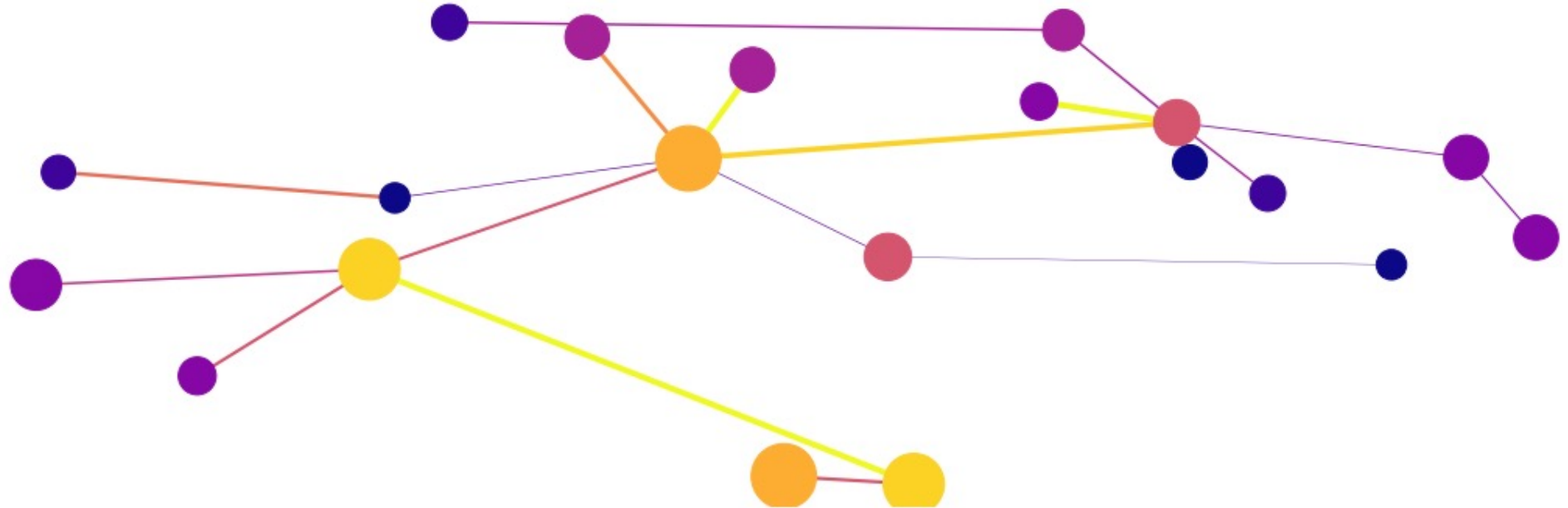
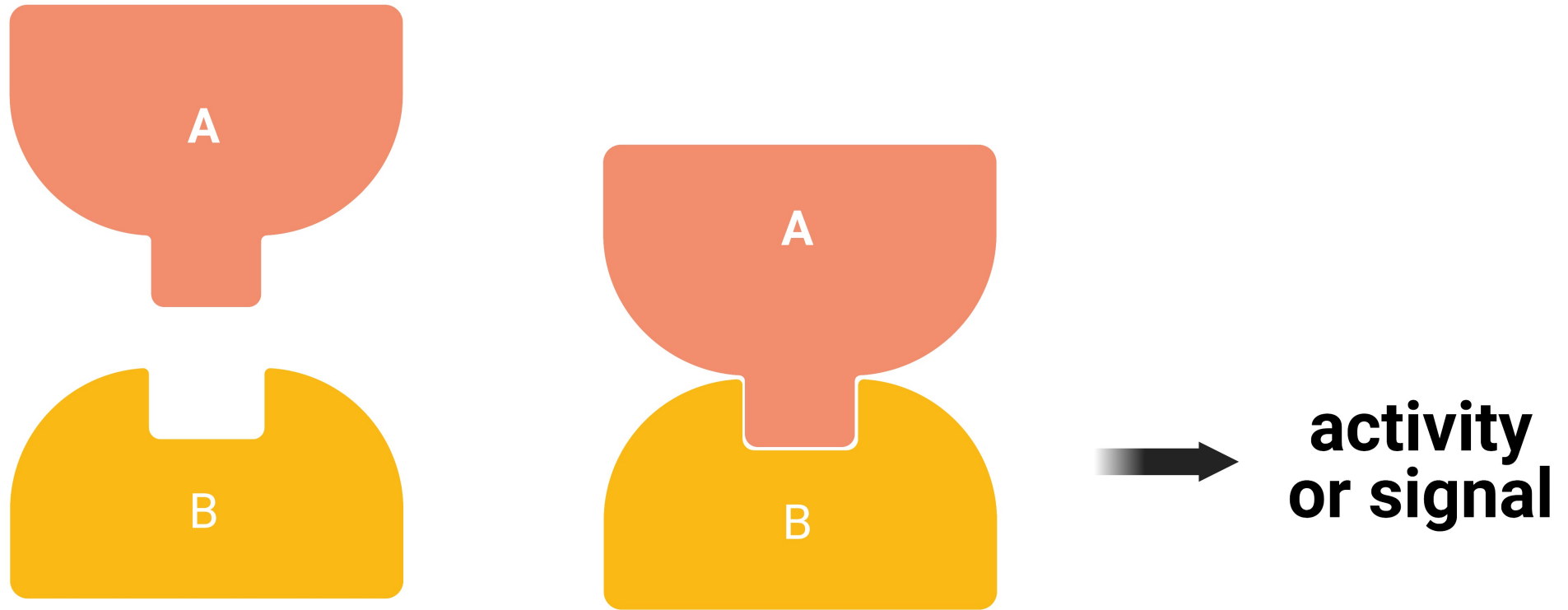


Methods for detecting protein-protein interactions

Danielle Schmidt

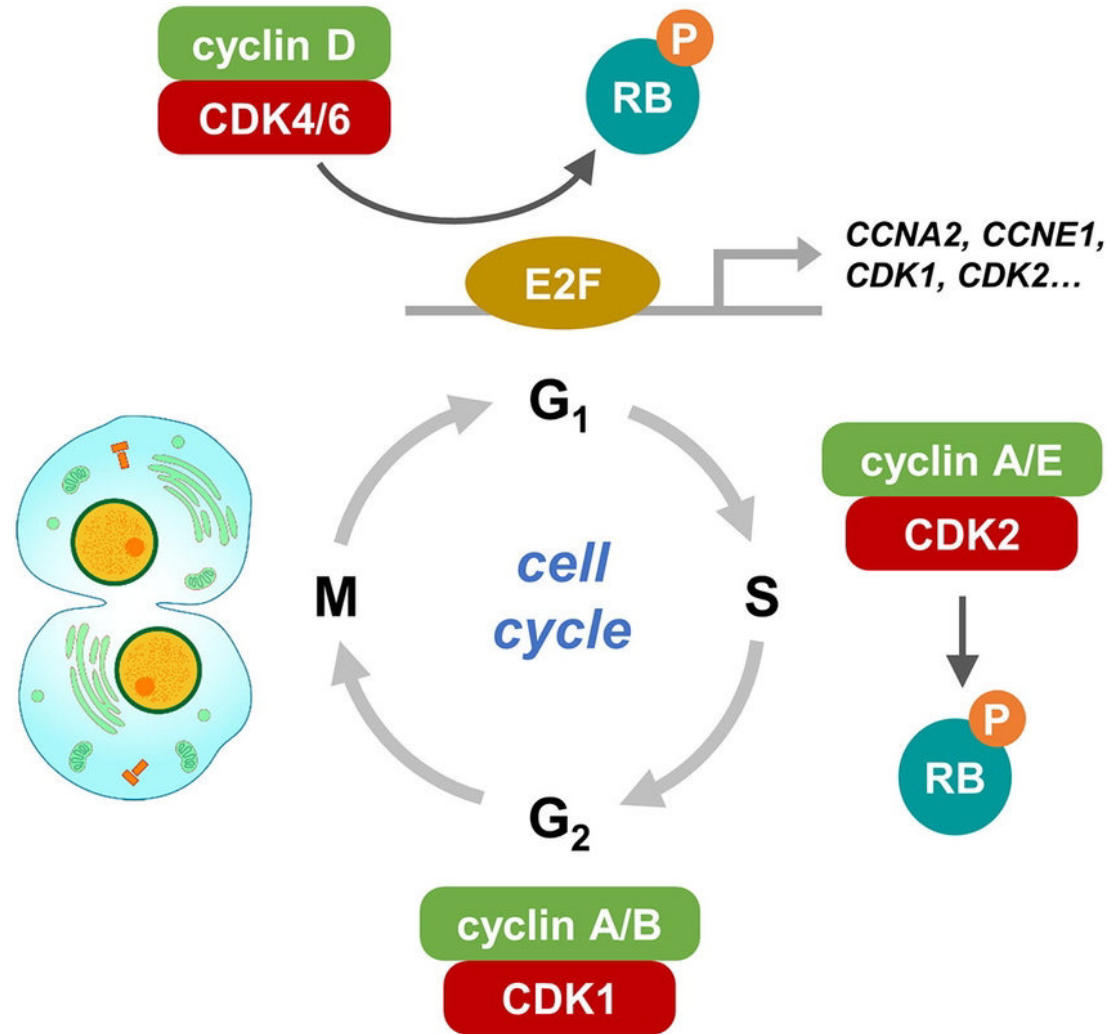


What are protein-protein interactions (PPIs)?



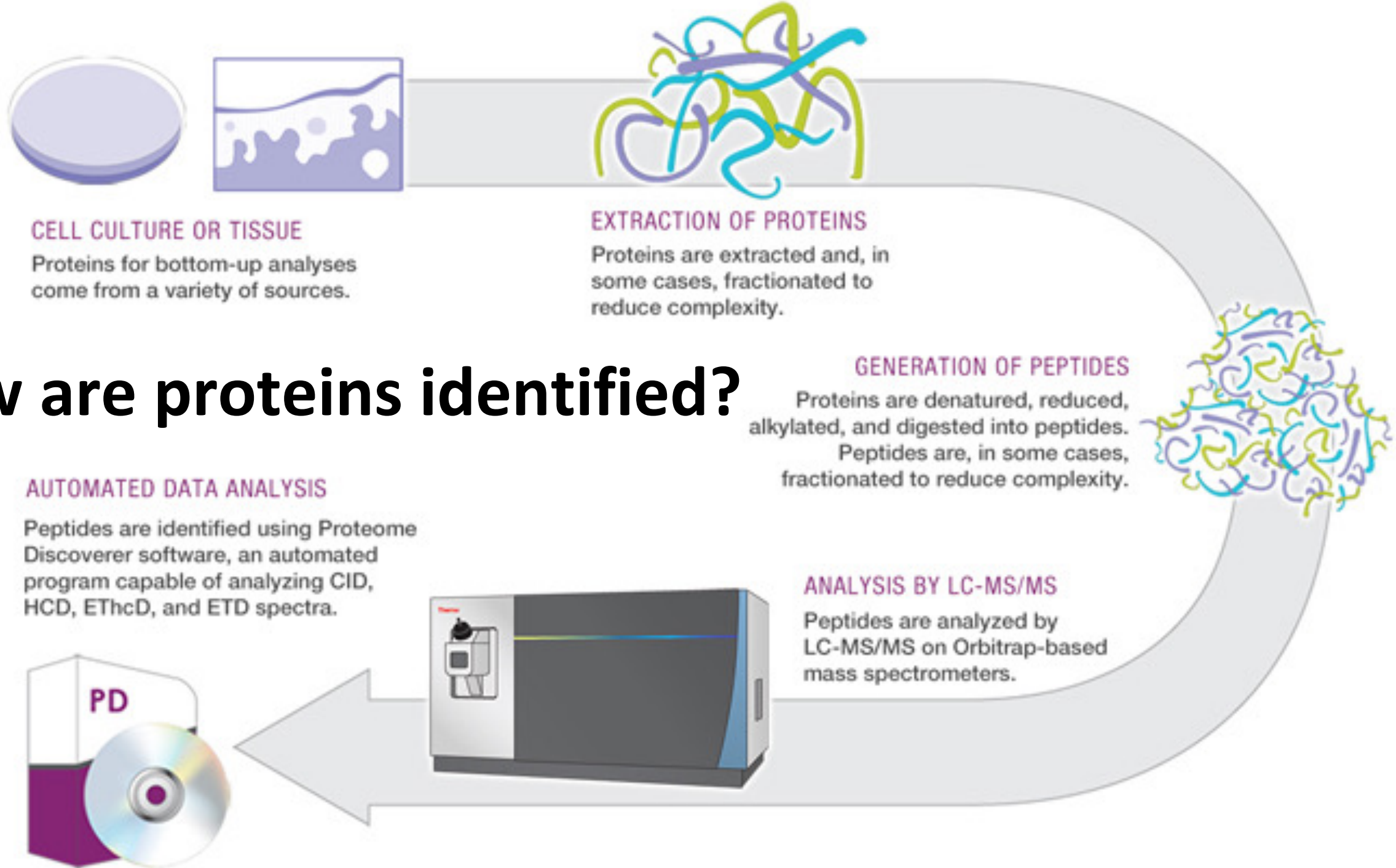
Communications between proteins that are involved in many cellular processes

Why are PPIs important?

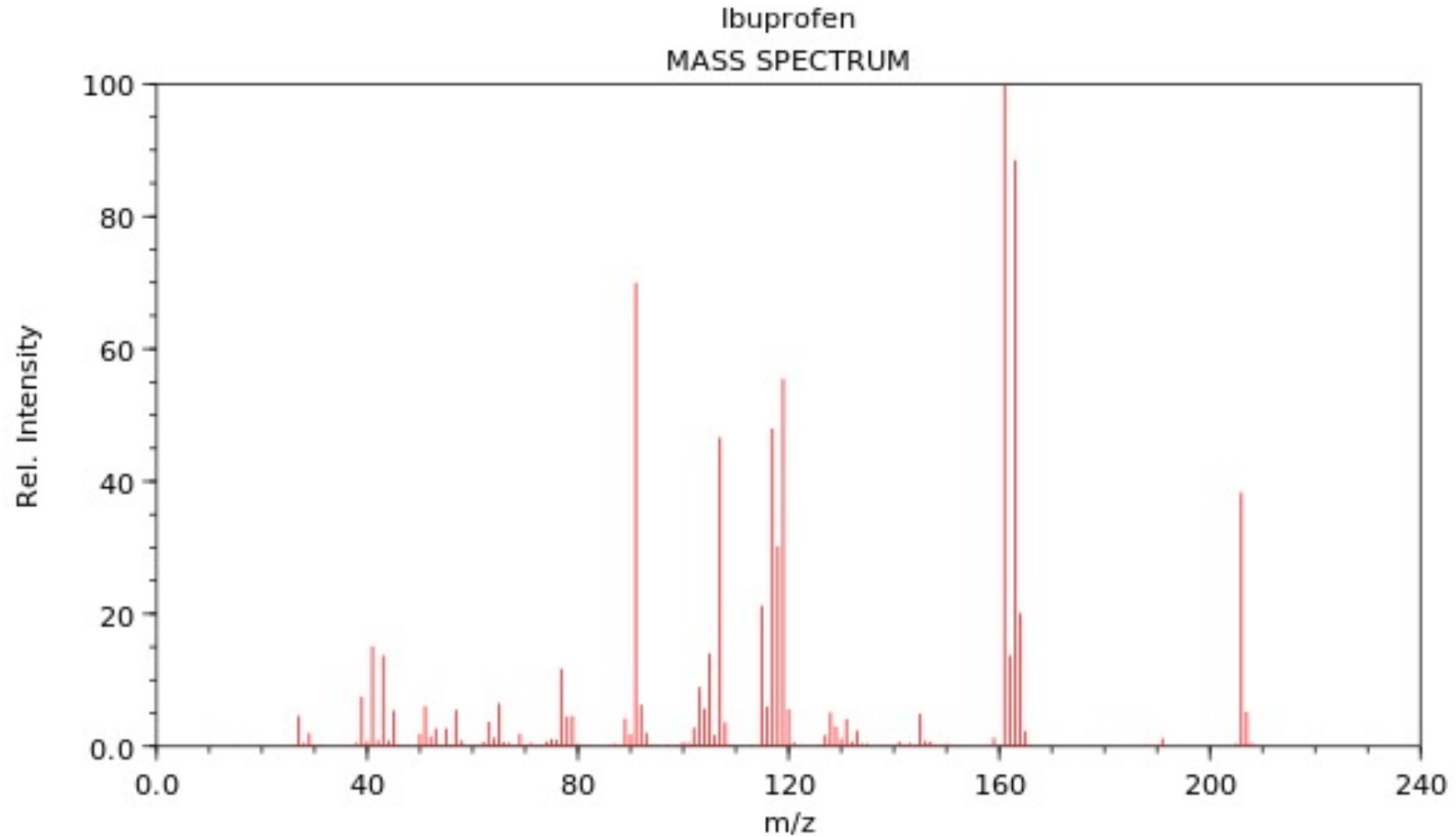


Integral for communication in biological processes like the cell cycle

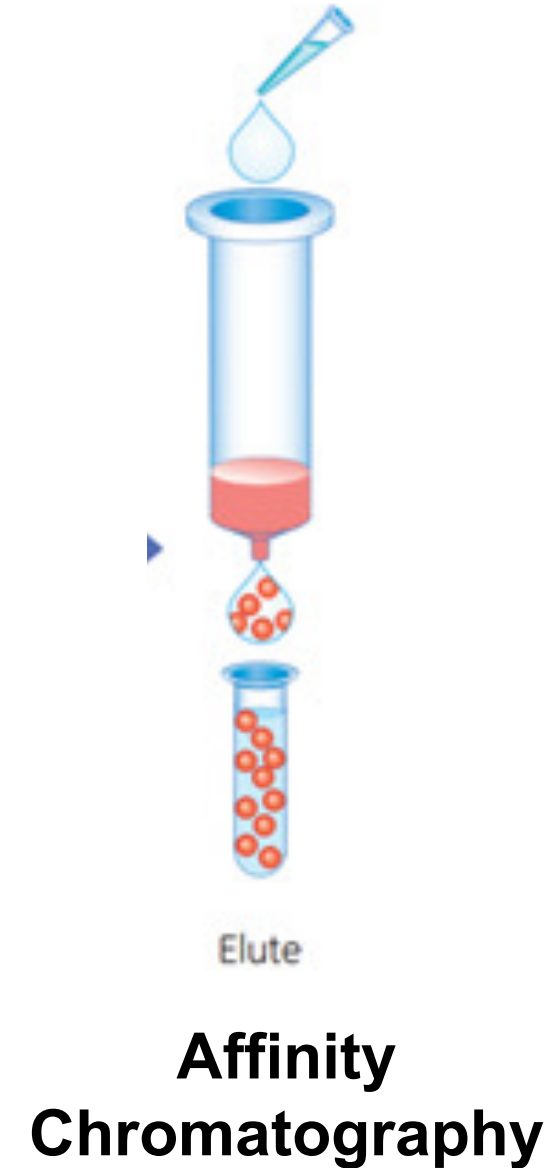
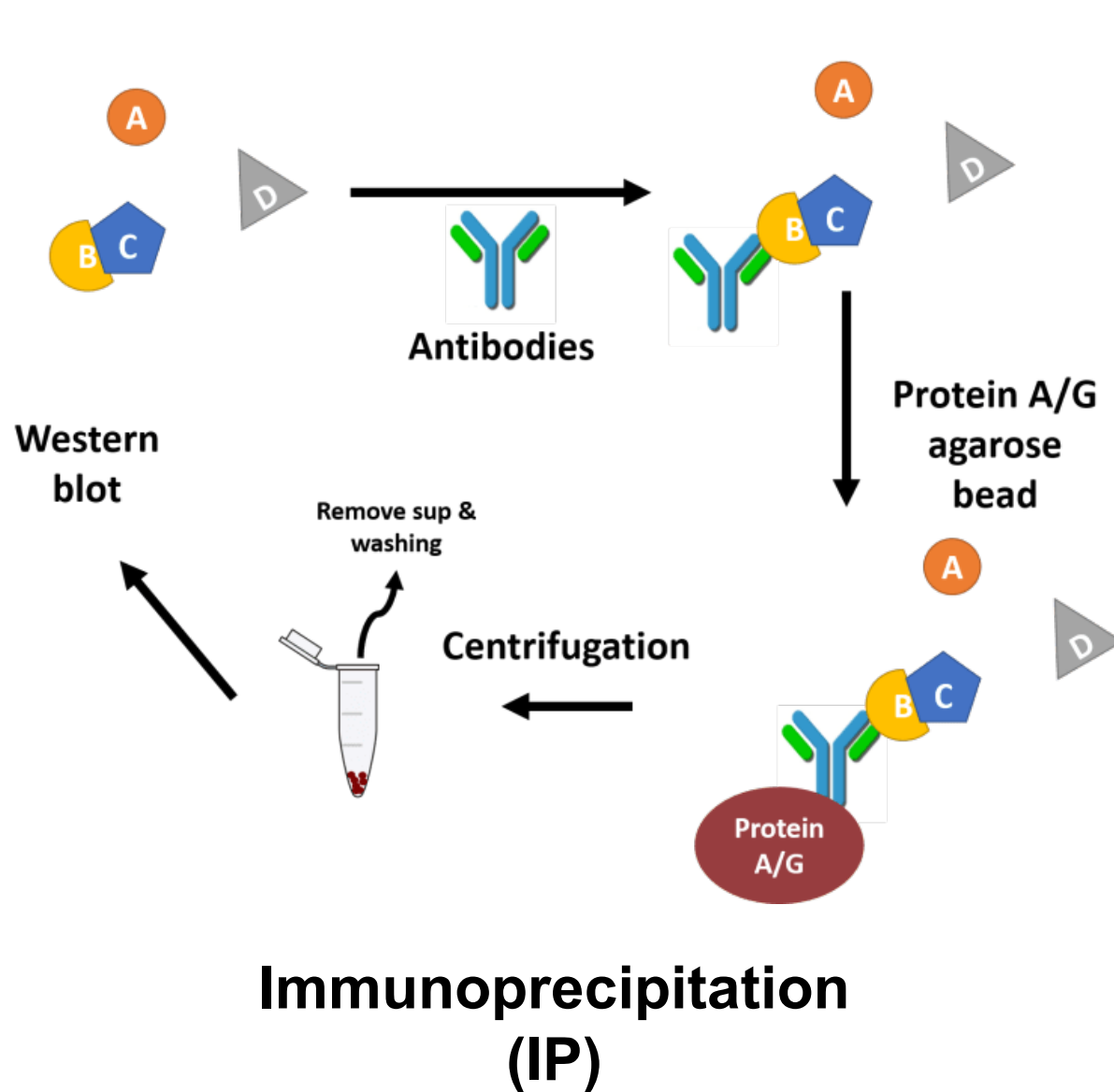
How are proteins identified?



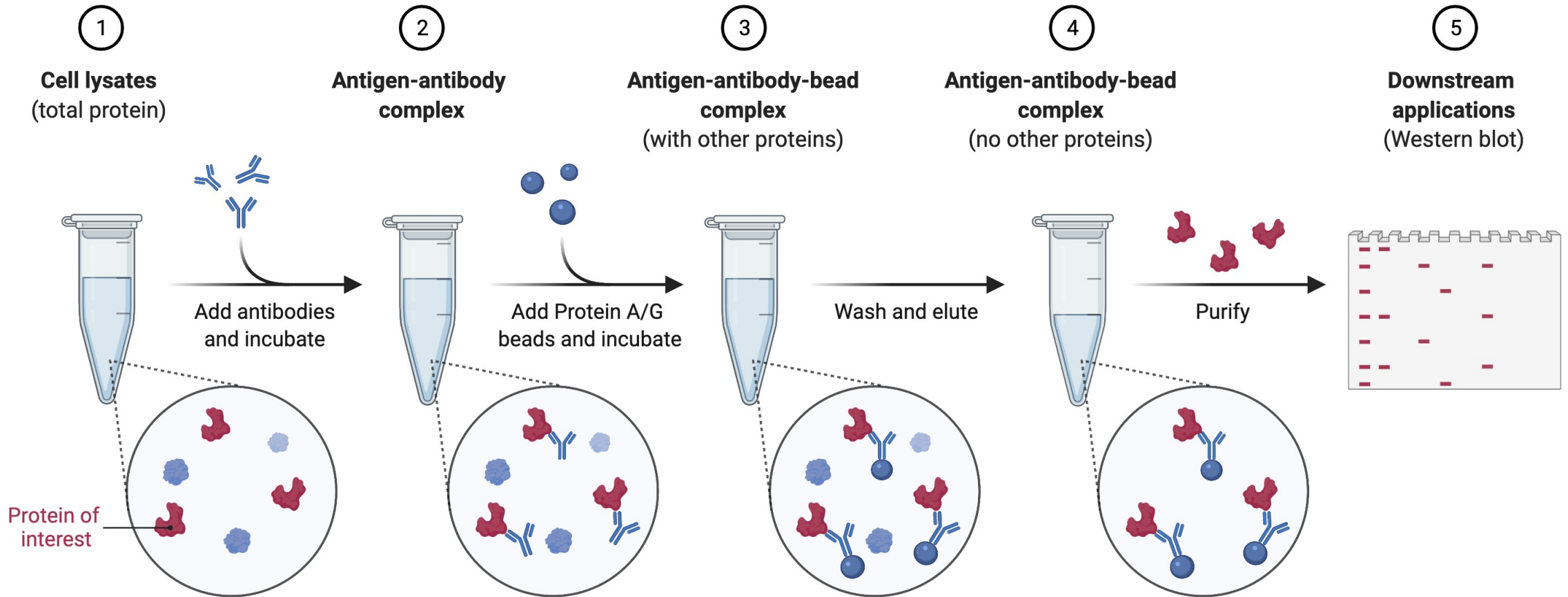
How does mass spectrometry work?



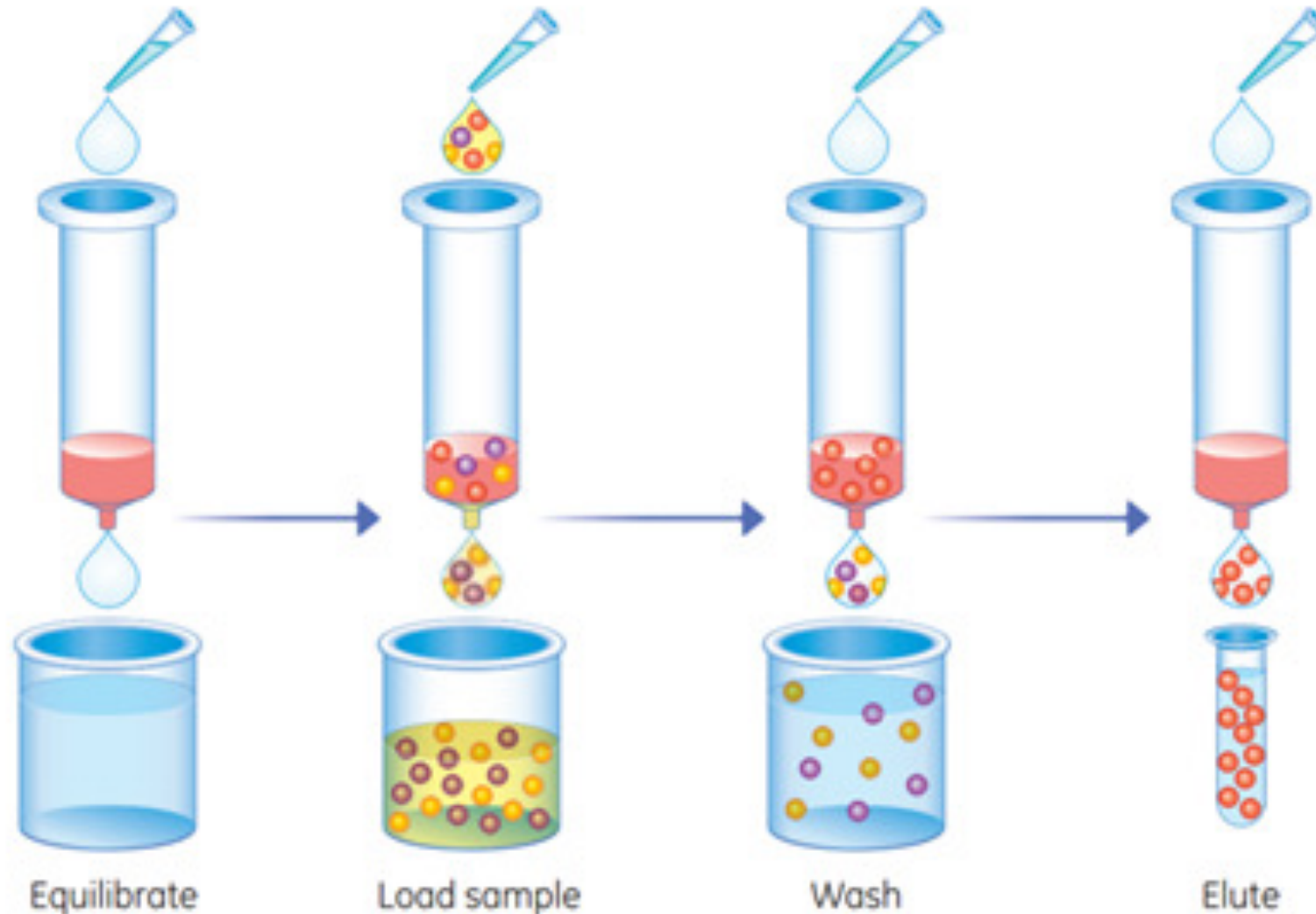
What are ways to isolate protein interactions?



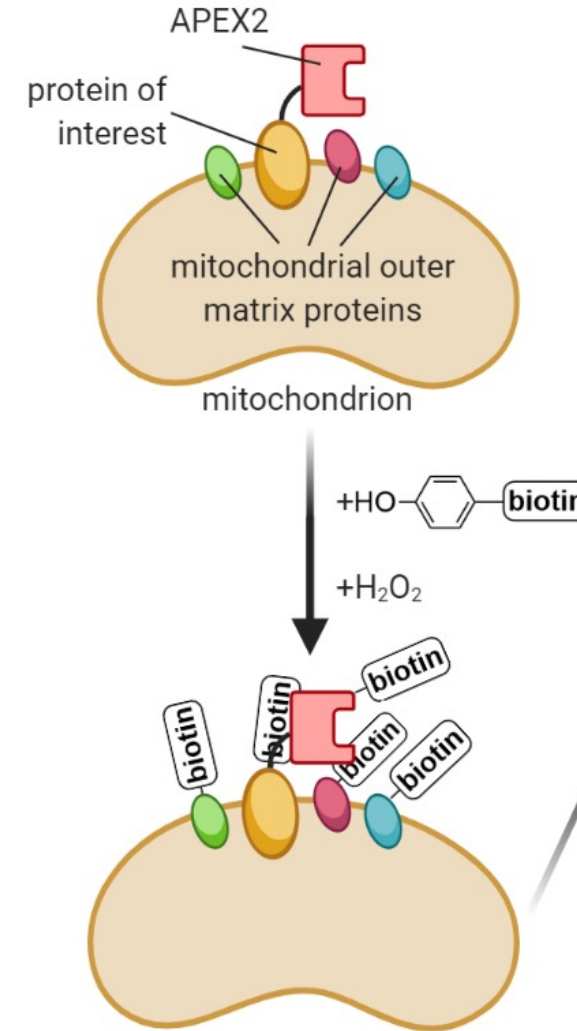
How does an immunoprecipitation experiment work?



How does affinity chromatography work?

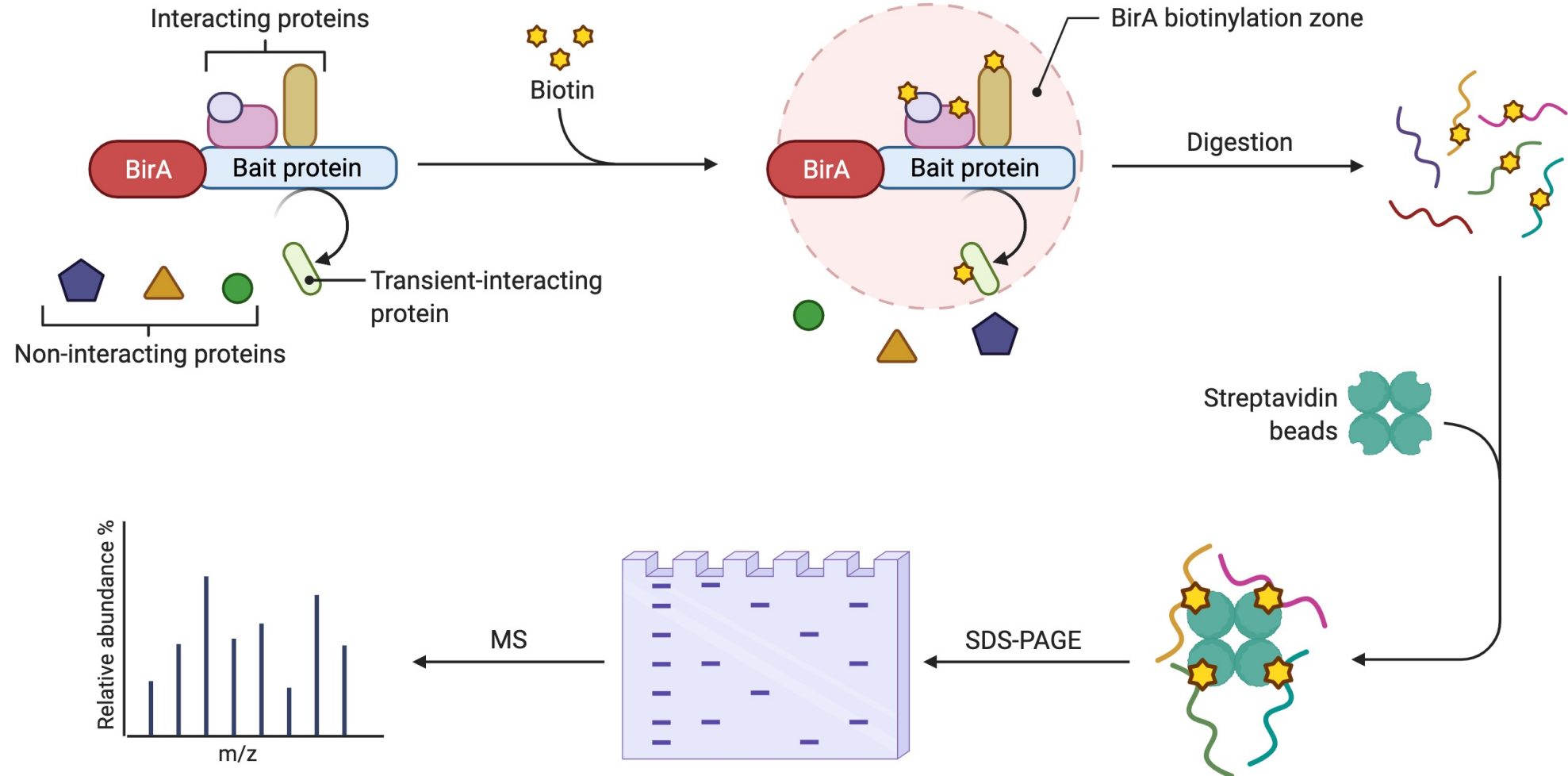


What in the past has limited the study of PPIs?



Constricted to high affinity proteins and nonphysiological conditions

What is proximity-dependent labeling?

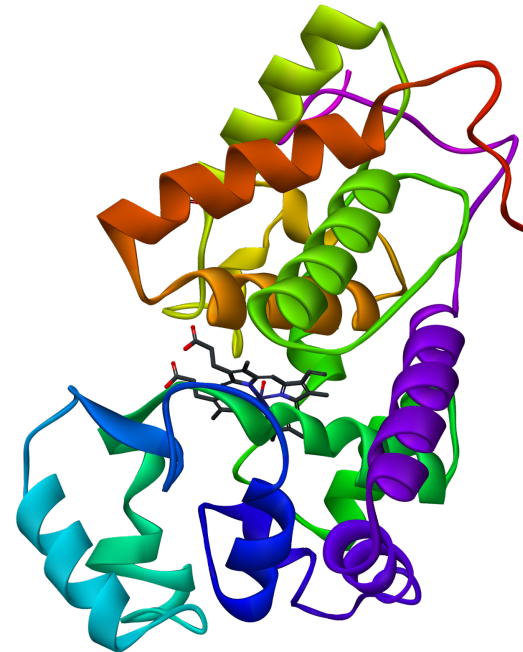


What are the two common proximity-dependent labeling methods?

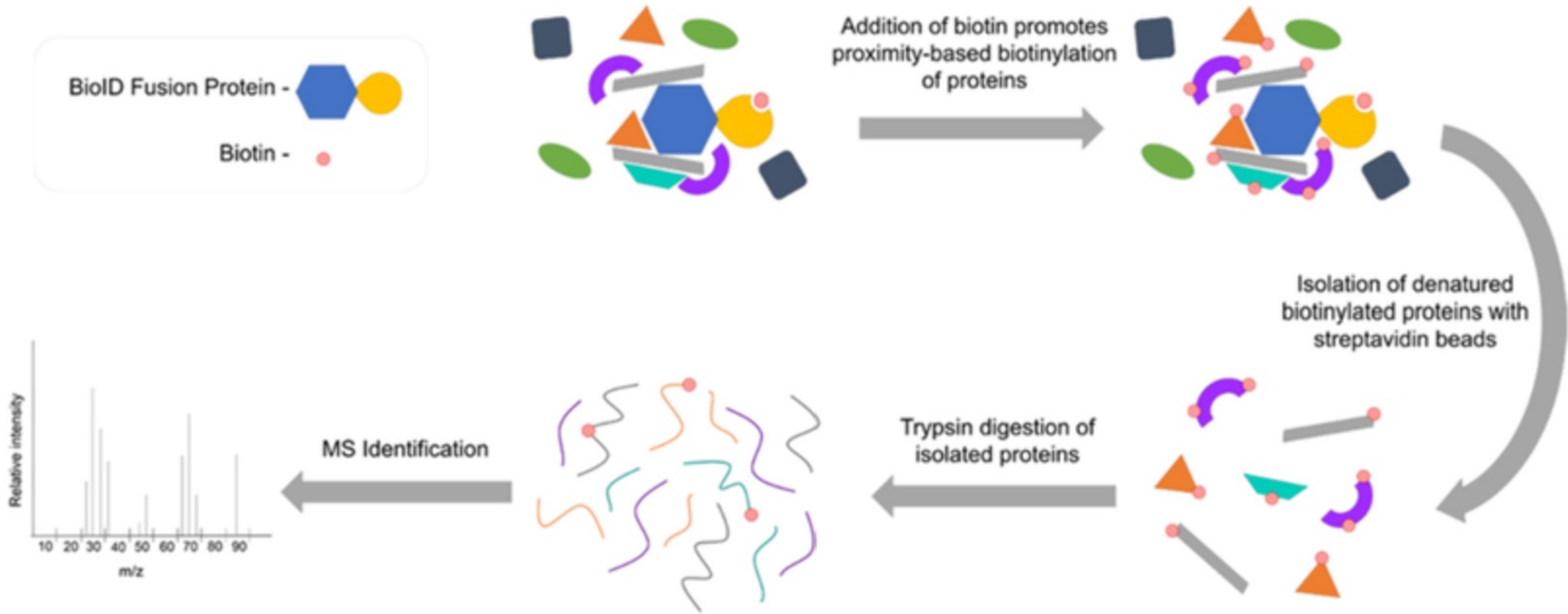
Biotin Identification (BioID)



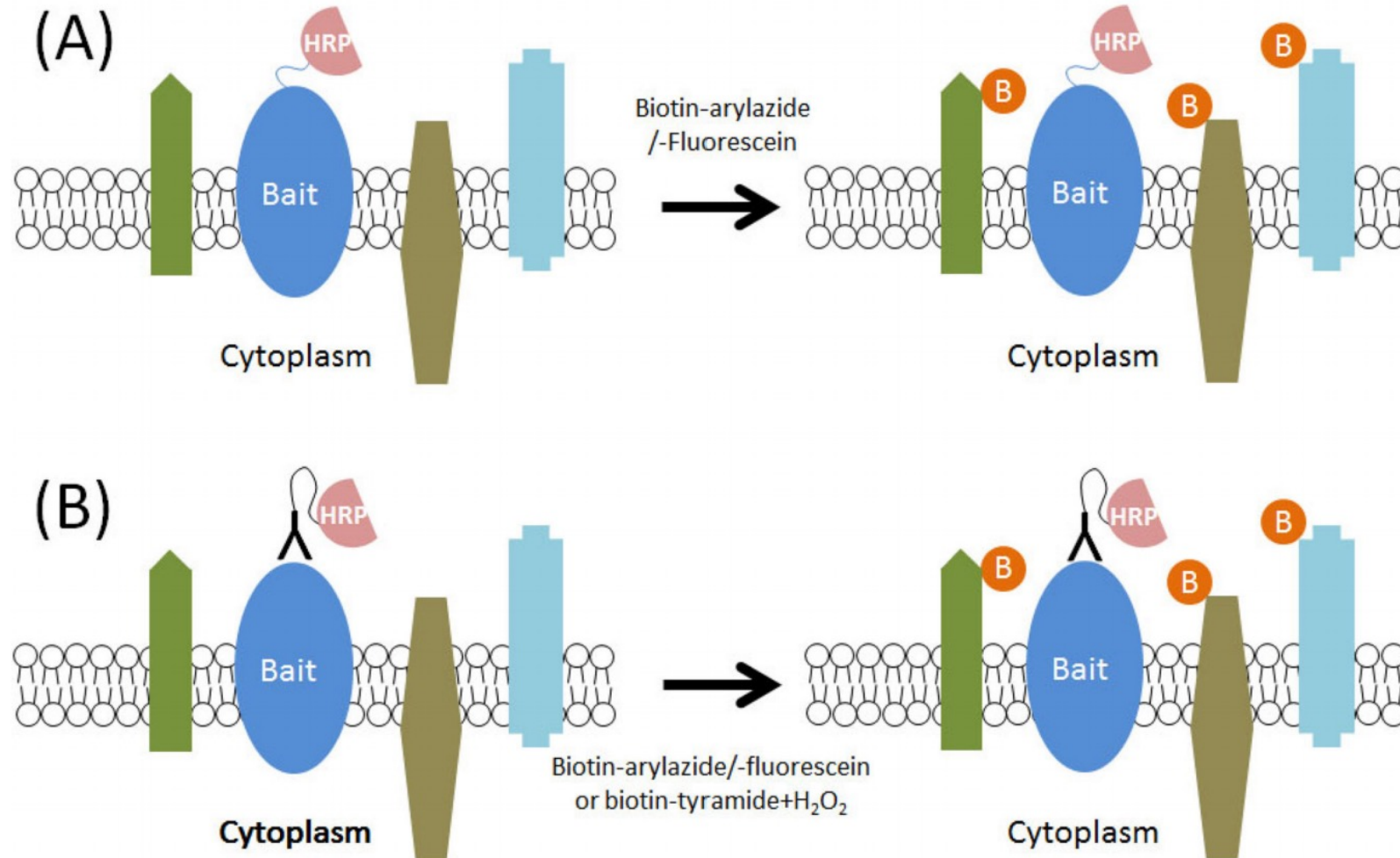
Horseradish Peroxidase (HRP)



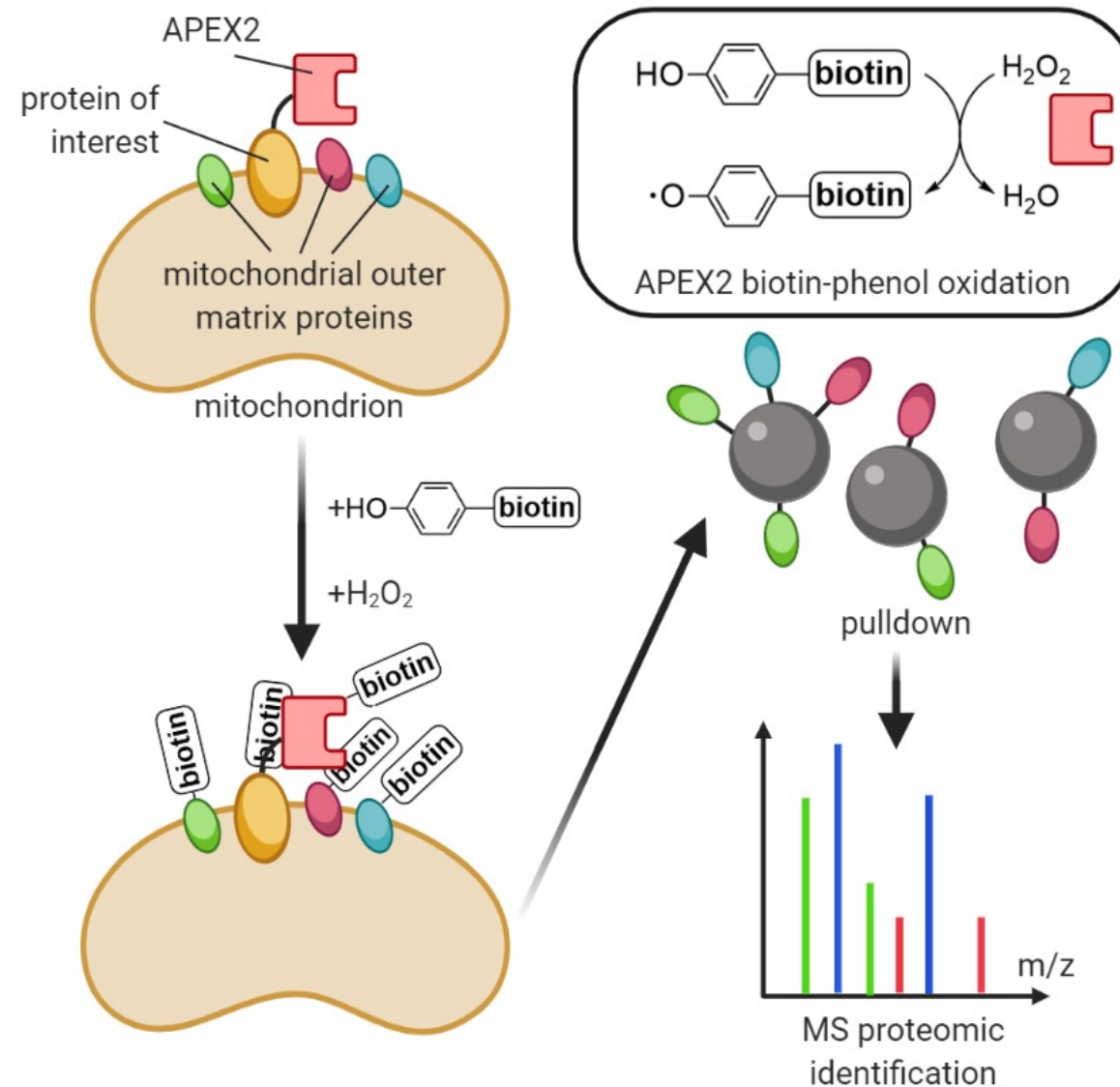
How does BioID work?



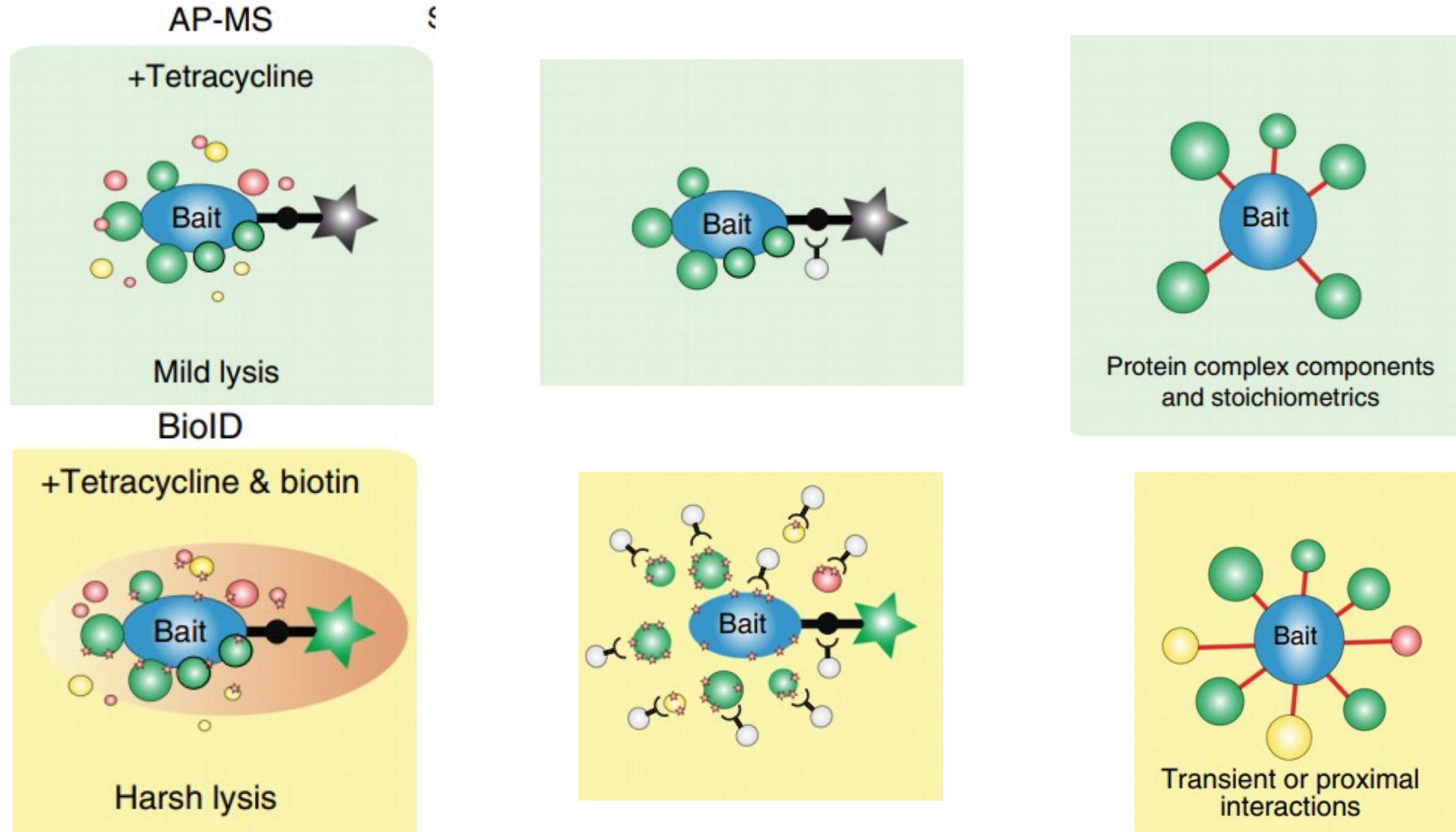
How does the HRP-based approach work?



What is an example of how proximity-dependent labeling can be used?



What is MAC-tag?

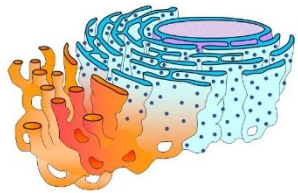


Combination of BioID and Affinity Purification-MS

What are the advantages and disadvantages of using these techniques?

Detects low affinity PPIs

Used in complex model
systems



in vitro and *in vivo*



Advantages

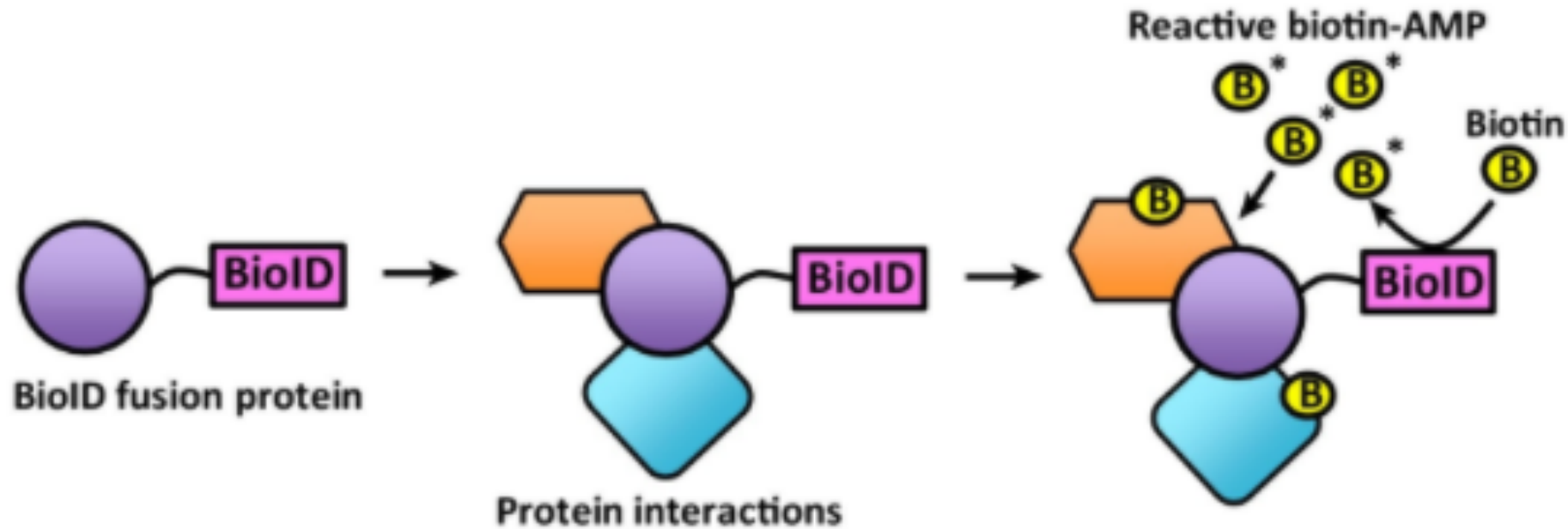
BioID cannot be used in
secretory pathways

Time

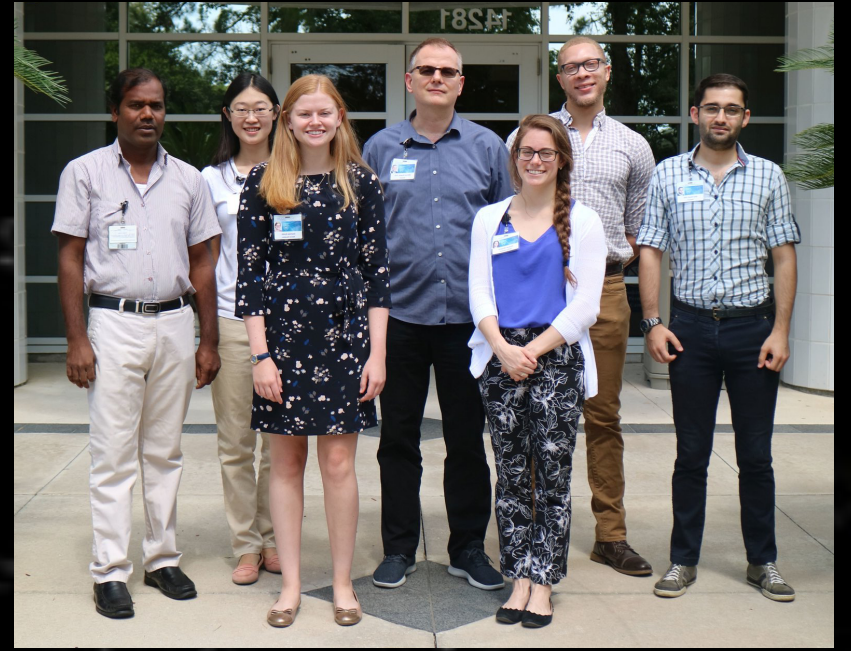
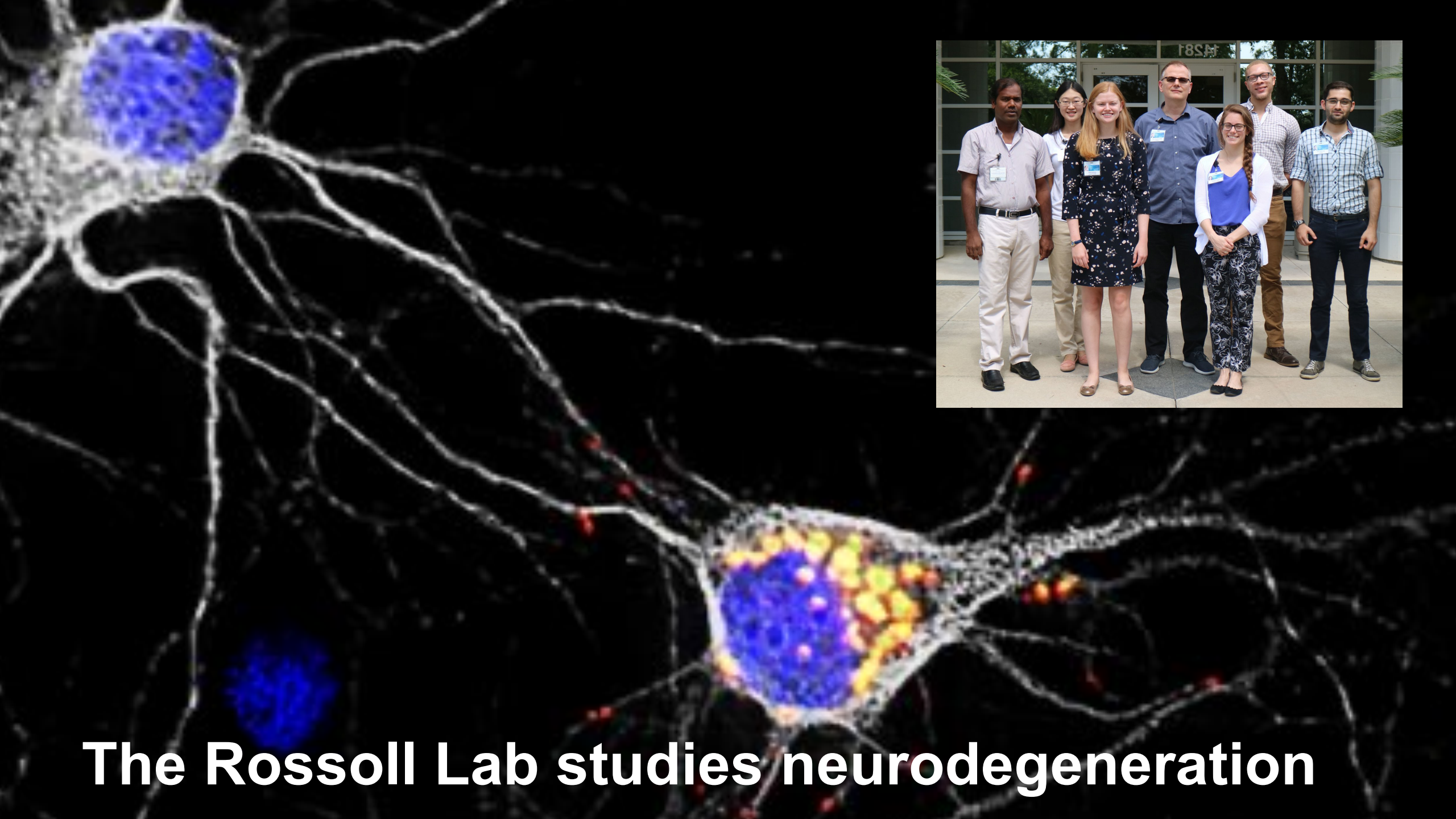


Disadvantages

How can BioID be used in neurodegenerative research?



To study the proteome of TDP43 aggregates within the cytoplasm



The Rossoll Lab studies neurodegeneration

Review

Older PPI identification techniques have limitations in detecting low affinity proteins and replicating physiological conditions

Proximity-dependent labeling can overcome previous limitations by using techniques such as Biold and HRP

These new techniques can be used in researching neurodegenerative conditions



Questions?

References

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