# Structure and functional properties of myosin induced by electrostatic fields at different pH values

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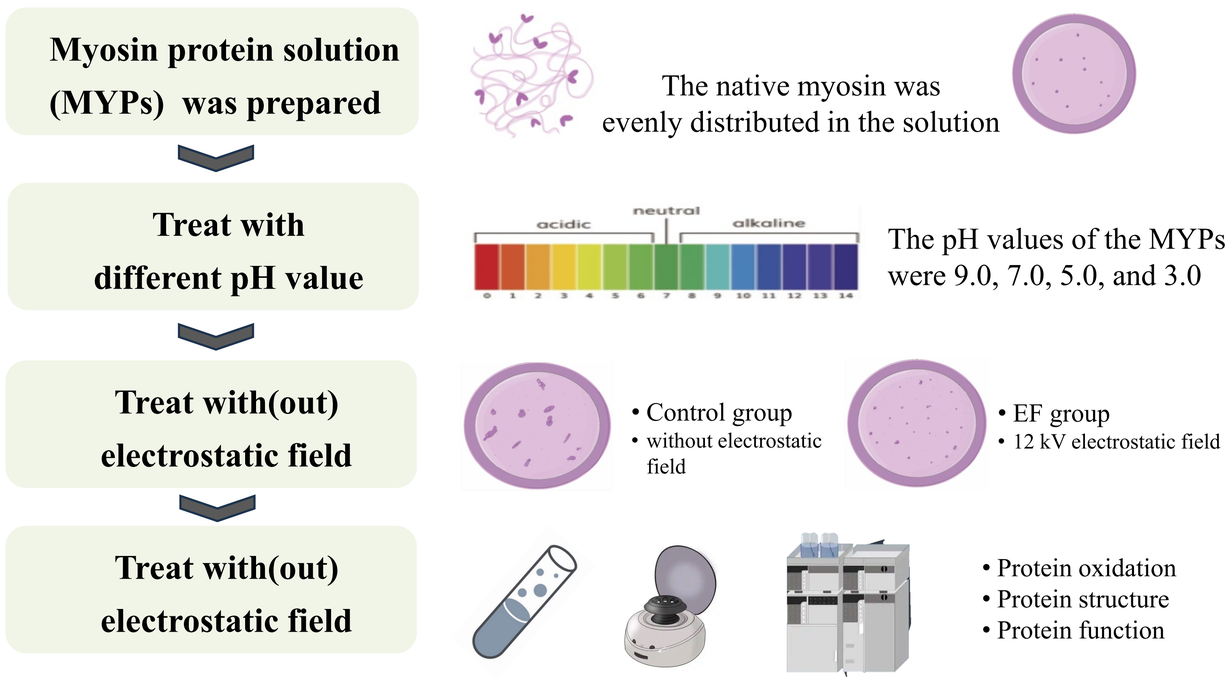
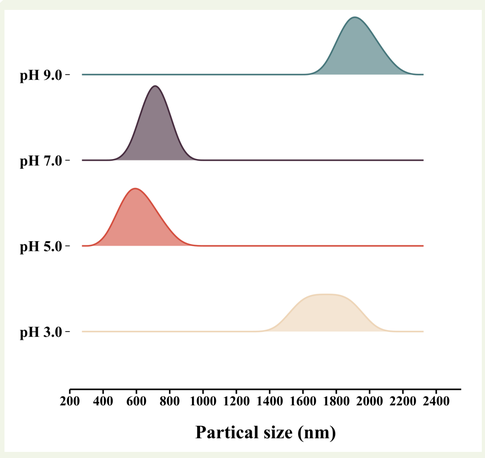
## I. Introduction

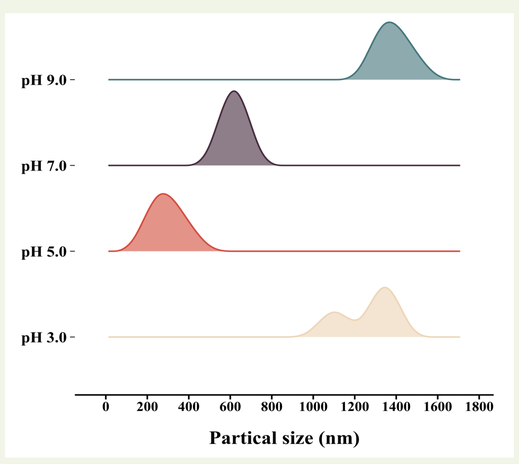
- Alterations in charged groups and electrostatic interactions between proteins could be impacted by external and internal variation pH value conditions, thus altering protein structure and function
- The charge released by the electrostatic field has a positive effect on the electrostatic interaction between macromolecular substances and the adjustment of the surface net charge distribution
- The regulation of protein surface potentials and intermolecular interactions by electrostatic fields provides a controllable strategy for charge redistribution and optimization of functional protein properties

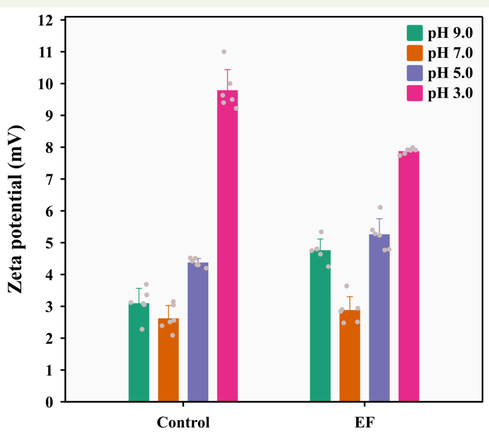
## II. Materials and Methods



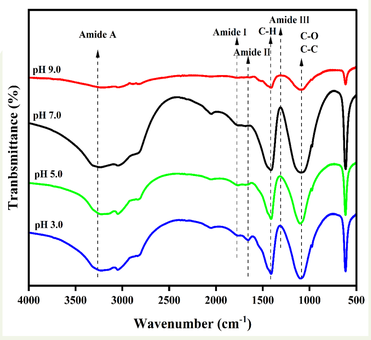

## III. Results and discussion

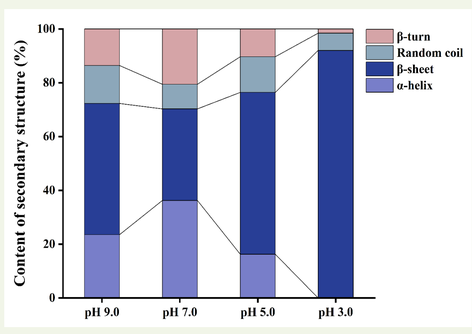


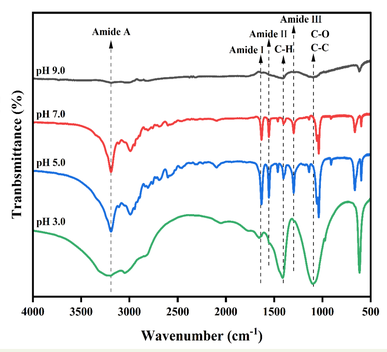

- A lower particle size and Zeta-potential of the EF group compared to Control group
- Electrostatic field could improve the structural and functional characteristics of proteins damaged by the highest and lowest pH value.

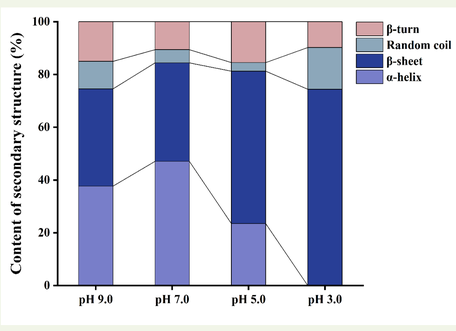



- The MYPs under electrostatic field exhibited a higher content of α-helix than the Control group.

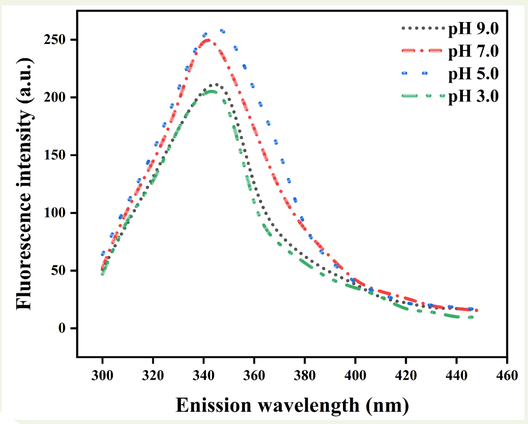
- A more stable secondary structure of the protein displayed under electrostatic field

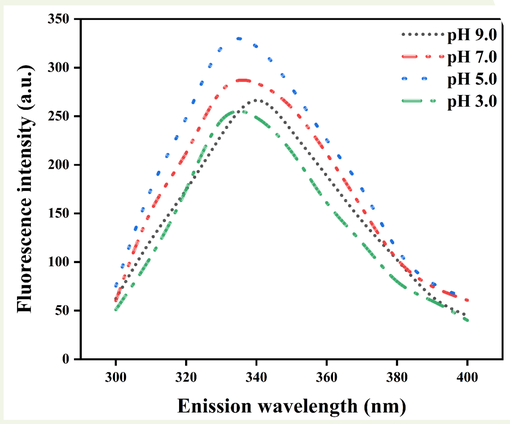


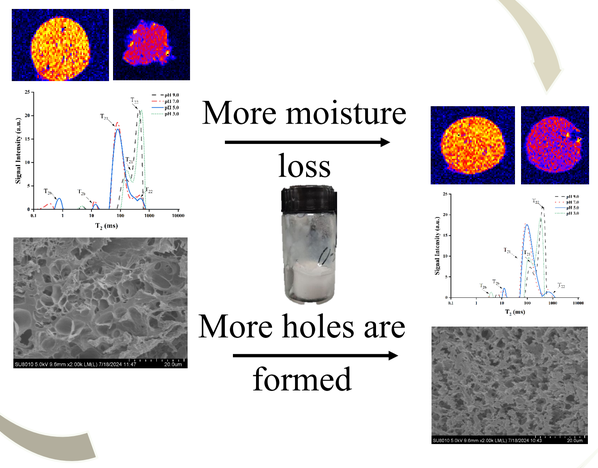



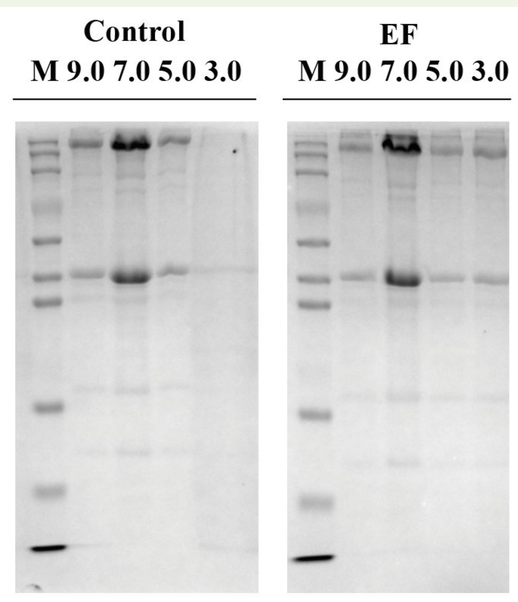

- The degradation of myosin heavy chain, tropomyosin, and myosin light chain increased at EF group

- The fluorescence intensity of the EF group was higher than that of the Control group at each pH value
- The electrostatic field shielding the tryptophan residues on the surface of the protein.




- The bands of protein in the EF group were deeper at pH 9.0, 5.0, and 3.0.
- The degree of protein oxidation was lower than that in the Control group.

## IV. Conclusion

- The electrostatic field protects the structure and function of myosin at different pH values.
- A more stable protein structure could be encouraged by the electrostatic field, which would help to better reduce the aggregation of protein.

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