Life Science

Structure determination of CENP-E, target protein to novel anticancer drug

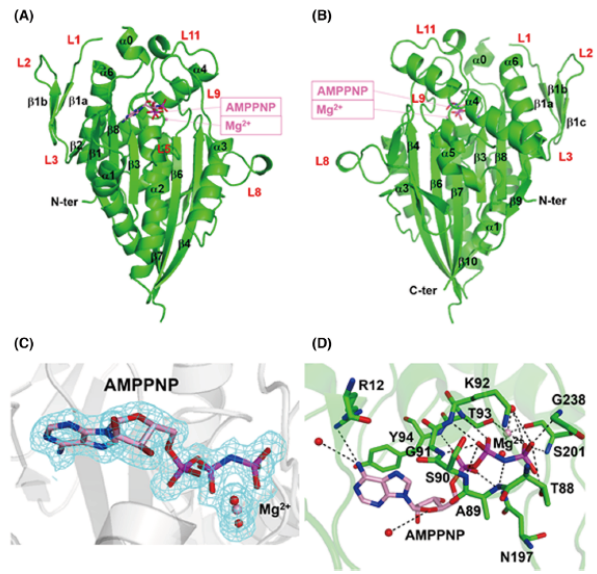
Hideshi YOKOYAMA
Professor, Department of Medicinal and Life Sciences, Faculty of Pharmaceutical Sciences, Tokyo University of Science

Purpose of Research

Inhibitors of kinesin CENP-E, which are required for the division of cancer cells, are promising anticancer drug candidates with minimal side-effects, due to explicitly targeting kinesin motor proteins. The purpose of this study is to develop novel anticancer drugs by determining the structure of CENP-E complex with its inhibitor.

Summary of Research

We determined the crystal structure of CENP-E complex with its non-hydrolysable ATP analog. And we compared the structure with that of CENP-E complex with ADP (hydrolyzed ATP). Further we aim to determine the structure of CENP-E complex with its inhibitor, and then we can get structural basis to develop novel anticancer drugs.



Structure of CENP-E (A) Front view (B) Back view (C) ATP-analogue AMPPNP-bound structure and electron density map (cyan) (D) Interaction of AMPPNP with CENP-E
Shibuya, A., Suzuki, A., Ogo, N., Sawada, J., Asai, A., & Yokoyama, H. (2023). Crystal structure of the motor domain of centromere-associated protein E in complex with a non-hydrolysable ATP analogue. *FEBS Letters*, *597*, 1138-1148.

Comparison with Conventional or Competitive Technologies

・Determining structures of CENP-E complex with its inhibitors
・Developing novel anticancer drugs

Expected Applications

・Elucidating structural basis to develop novel drugs
・Developing anticancer drugs with fewer side-effects

Challenges in Implementation

・Structure of CENP-E complex with its inhibitor was not determined.
・It is necessary to determine the structure.

What We Expect from Companies

・Practical application based on our research
・Creating a new model case for structural-based drug discovery through joint research

Points

・Determining the structure of CENP-E
・Developing anticancer drugs

Future Developments

2026.4 Determining structure of Kinesin CENP-E-inhibitor complex
2027.4 Development of candidates for novel anticancer drugs

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TOKYO UNIVERSITY OF SCIENCE Organization for Innovation and Social Collaboration
1-3, Kagurazaka, Shinjuku-ku, Tokyo, 162-8601, Japan E-MAIL: ura@admin.tus.ac.jp