Resource Summary Report

Generated by NIF on Apr 17, 2025

Protein Knots

RRID:SCR_008353
Type: Tool

Proper Citation

Protein Knots (RRID:SCR_008353)

Resource Information

URL: http://knots.mit.edu/

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Description: The knot server allows the user to check PDB entries or uploaded structures for knots and to visualize them. The size of a knot is determined by deleting amino acids from both ends. This procedure is, however, not perfect and the resulting size should only be treated as a guideline. Mathematically, knots are only well defined in closed (circular) loops. However, both the N- and C-termini of open proteins are typically located close to the surface of the protein and can be connected unambiguously: We reduce the protein to its backbone and draw two lines outward starting at the termini in the direction of the connection line between the center of mass of the backbone and the respective ends. The two lines are joined by a big loop, and the structure is topologically classified by the determination of its Alexander polynomial. To determine an estimate for the size of the knotted core, we successively delete amino acids from the N-terminus until the protein becomes unknotted. The procedure is repeated at the C-terminus starting with the last N-terminal deletion structure that contained the original knot. For each deletion, the outward-pointing line through the new termini is parallel to the respective lines computed for the full structure. Unfortunately, the size of a knot is not always precisely determined by this procedure, so reported sizes should therefore only be treated as approximate. Sponsors: Knots is funded by MIT.

Synonyms: Knots

Resource Type: data analysis service, production service resource, service resource, analysis service resource

Keywords: amino acid, backbone, core, c-terminus, knot, n-terminus, protein, protein databank, protein folding, size, structural model, structure

Funding:

Resource Name: Protein Knots

Resource ID: SCR_008353

Alternate IDs: nif-0000-25217

Record Creation Time: 20220129T080247+0000

Record Last Update: 20250417T065328+0000

Ratings and Alerts

No rating or validation information has been found for Protein Knots.

No alerts have been found for Protein Knots.

Data and Source Information

Source: SciCrunch Registry

Usage and Citation Metrics

We found 3 mentions in open access literature.

Listed below are recent publications. The full list is available at NIF.

Dabrowski-Tumanski P, et al. (2019) KnotProt 2.0: a database of proteins with knots and other entangled structures. Nucleic acids research, 47(D1), D367.

Dabrowski-Tumanski P, et al. (2017) LinkProt: a database collecting information about biological links. Nucleic acids research, 45(D1), D243.

Faísca PF, et al. (2015) Knotted proteins: A tangled tale of Structural Biology. Computational and structural biotechnology journal, 13, 459.