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Difficult Structure for Interesting Reason - *E.coli* yfbU Gene Product. Dominika Borek, Yuanhong Chen, Mingzhu Zheng, Zbyszek Otwinowski, Biochemistry, UT Southwestern Medical Center, 5323 Harry Hines Blvd., Dallas, TX 75390-9038 USA.

Large crystal unit cells, high NCS, pseudo-symmetry could make the structure solution difficult. The example of efficient dealing with all these problems will be presented. 170aa protein crystallized in space group P23 with a=230.6Å. The unit cell dimensions suggested 10-25 molecules in ASU. We optimized crystallization conditions to obtain larger crystals and changed the cryo-protectant to minimize mosaicity. Predicted numbers of methionines (~240) discouraged using Se-based phasing methods. Sodium bromide soaking was tried but presence of too many sites prevented to find them directly from this derivative. Finally, SIRAS data for the Hg-derivative was collected to 4.2Å. 32 Hg positions were present in the structure. NCS could not been identified by standard programs. Derivative crystals were non-isomorphous with native data. Moreover, native Patterson map indicated pseudosymmetry. NCS was found using *ad hoc* software based on guessing NCS arrangement from space group and packing considerations. Structure was solved by combination of SAD phasing, NCS averaging and multiple crystal averaging. The molecule represents an interesting case of 24-meric protein with unusual pattern of domain swapping.