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Unusual Pseudo-nine-fold Rotational Symmetry in Crystals of the *Panulirus interruptus* Clottable Protein.
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The formation of clots in crustacean hemolymph is the result of the covalent cross-linking of a large (~400kDa) dimeric clottable protein to form an insoluble polymer. The clottable protein is a member of a class of lipid transport proteins including lipovitellin and apolipoprotein B. The clottable protein from the California spiny lobster, *Panulirus interruptus*, was purified and crystallized in two different forms. One of the crystal forms (spacegroup P21 a = 149., b = 158., c = 325. b = 93.3.) exhibits nine-fold rotational symmetry in the self-rotation function. This rotational symmetry was difficult to explain, however, as nine protein molecules would not fit into the asymmetric unit. It was important to understand the noncrystallographic symmetry in attempts to solve the structure by molecular replacement, so the crystal density was determined using Ficoll gradients. The measured density indicates that there are only three dimers in the asymmetric unit. A model was created based on the measured unit cell contents which explains the observed self-rotation function as resulting from the interaction of the symmetry elements from both asymmetric units of the unit cell.