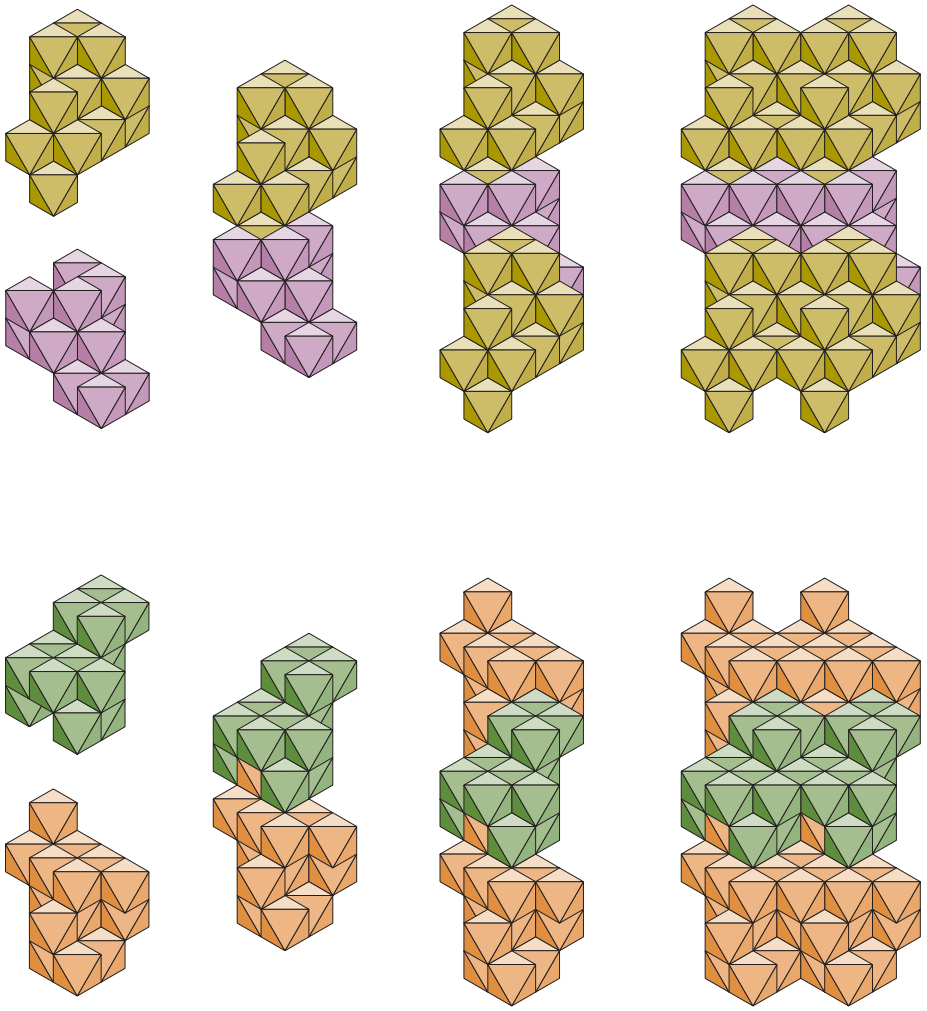
Sheets of connected parallel strands in parallel planes

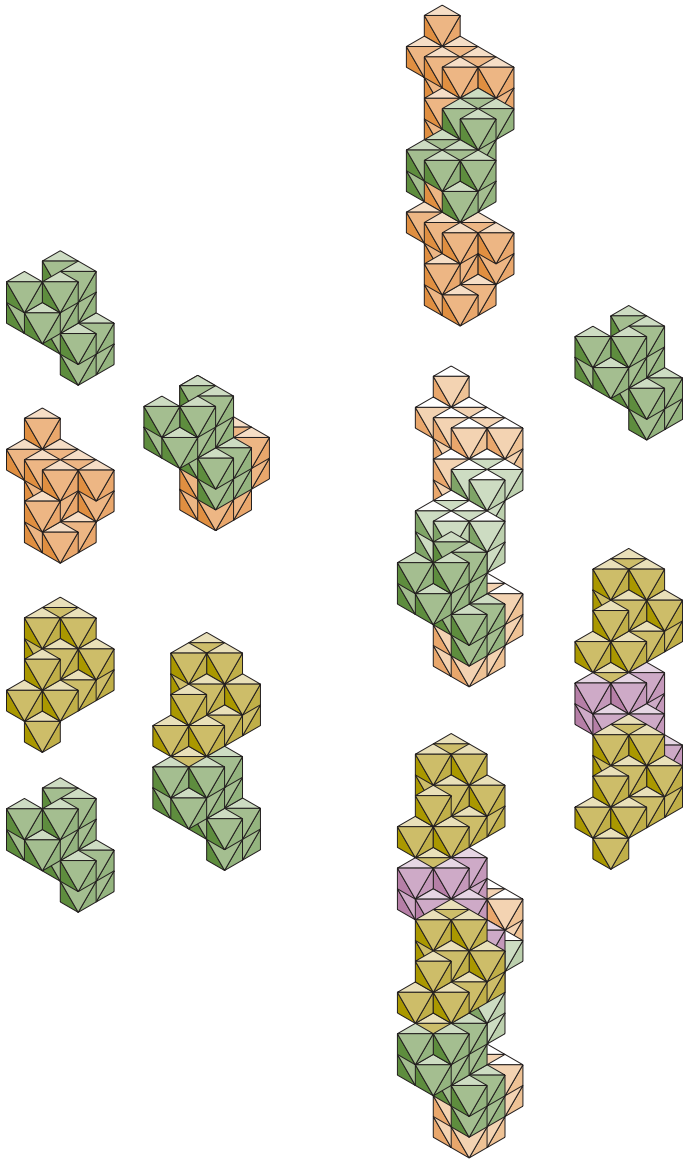
Robert William Whitby
http://homepage.mac.com/whitby
http://web.me.com/whitby/Octahedron/Welcome.html

Two beta180-strands can be linked by a single peptide so as to permit them to sheet-join with identical chains to form a pair of sheets on parallel planes.



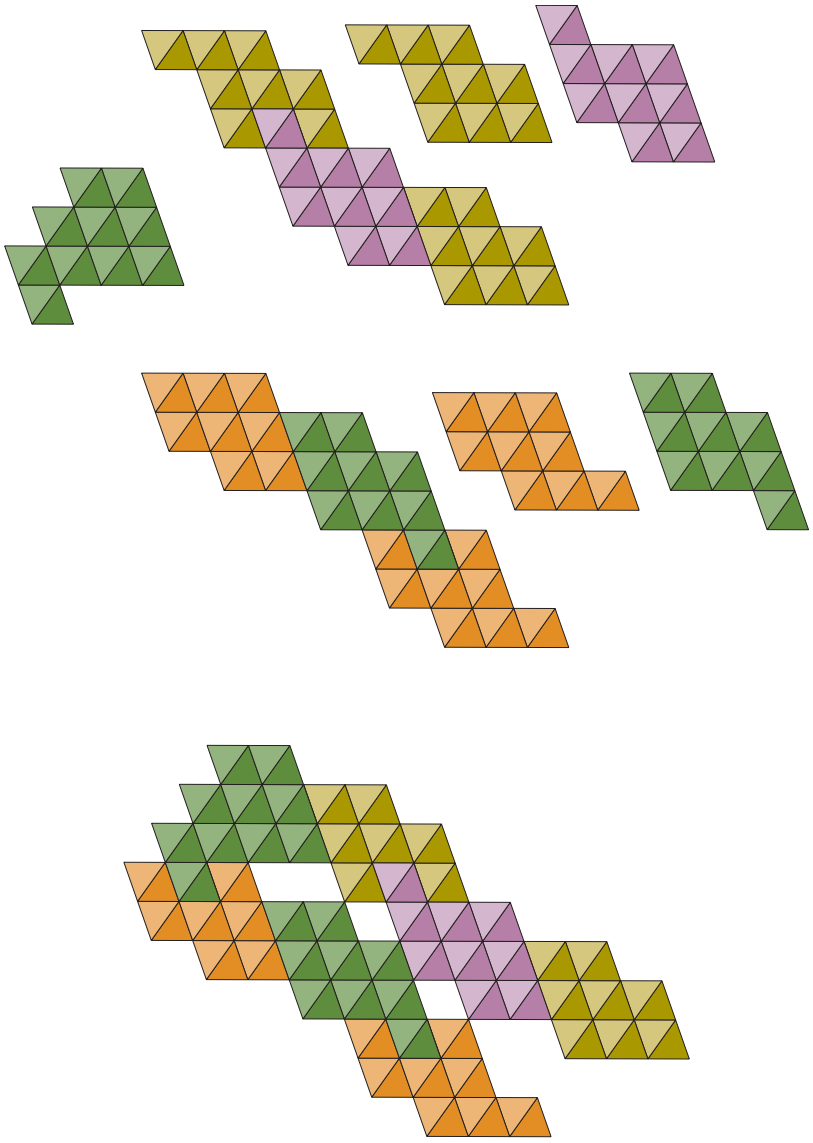
Pleated sheets–two parallel strands

The figure shows the assembly of two pleated sheets each having two strands running parallel. Each sheet uses main chain units in the two orientations, identified by their color, shown in the left most column. A pair of joined residues is just to the right. The three residue chain comes next. The rightmost columns shows the completed two strand sheet. The sheet at the top and the sheet at the bottom differ by a rotation of 1/2-turn about the bottom edge of the page.



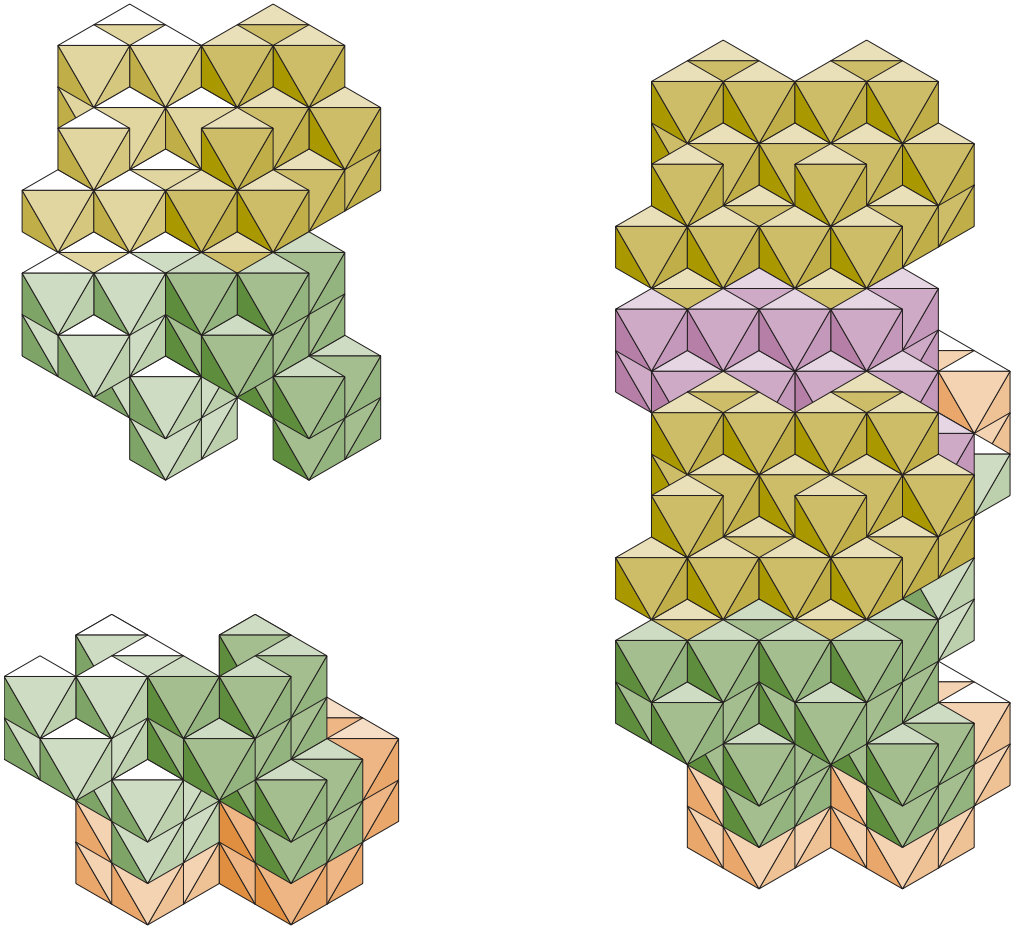
Peptide chain with two beta180-strands on different sheet planes.

The figure shows the linkage between two beta180-strands on different planes into a single chain. The linkage is shown on the left. The green residue is the linker and does not participate in either sheet. The orange residue belongs to the strand of the farther sheet and the yellow belongs to the strand of the nearer sheet The assembly of the two strands into a single chain takes place on the right. The stand at the top joins with the green linker peptide to commence the assembly. The join is alpha-helical.The strand on the right joins to the female end of the linker peptide in a 4helical join which completes the chain.



Peptide chain of two beta180-strands viewed parallel to their sheet planes and perpendicular to the strand axes.

The peptide colors are the same as those used in the previous figure. The linker peptide is on the left. The sheet residues are to the right of the beta180-strands. The finished chain is at the bottom. There is contact between the edges of two He-octas of the NH2-group of the yellow residue and the edges of two He-octas of the O-atom of the green residue. The contract between the orange and violet residues is the same.



Two chains of two strands each forming two sheets which are parallel

The figure shows the relationship of the pair of linker peptides to each other and to the strands which they link. The two sheet-joined chains are shown on the right. Identical chains in identical orientation can be joined to either side of the sheet. The strands can be lengthened.