Figure S1. Helical reconstruction of pKpQIL pili, Related to Figure 1.
(A) Global power spectrum from 82,261 384 px long segments before any sorting (**B**) The power spectrum of 20,798 overlapping segments after discarding those with out-of-plane tilts greater than 2°, showing separated peaks on the layer line $1/(12.5\ \text{Å})$. This is indicative of the 1-start helical symmetry of pKpQIL pili. (C) The power spectrum from segments selected as having an out-of-plane tilt greater than or equal to 12°. The meridional intensity in this power spectrum would appear to be indicative of an n=0 layer line if one was not aware of the out-of-plane tilt. (D) The map filtered to 5 Å from helical reconstruction imposing 1-start helical symmetry (helical twist 77.6° and helical rise 2.7 Å). (E) The map filtered to 5 Å from helical reconstruction imposing 5-fold rotational symmetry (helical twist 24.5° and helical rise 12.5 Å).
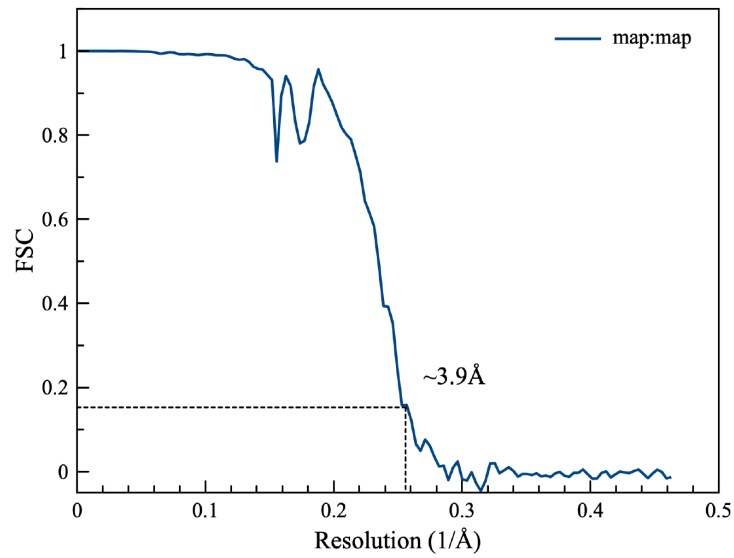
Figure S2. Resolution estimate of pKpQIL pilus reconstruction, Related to Figure 1.
The FSC between two-independent half maps, each generated from two non-overlapping datasets, shows a resolution of 3.9 Å at FSC=0.143.
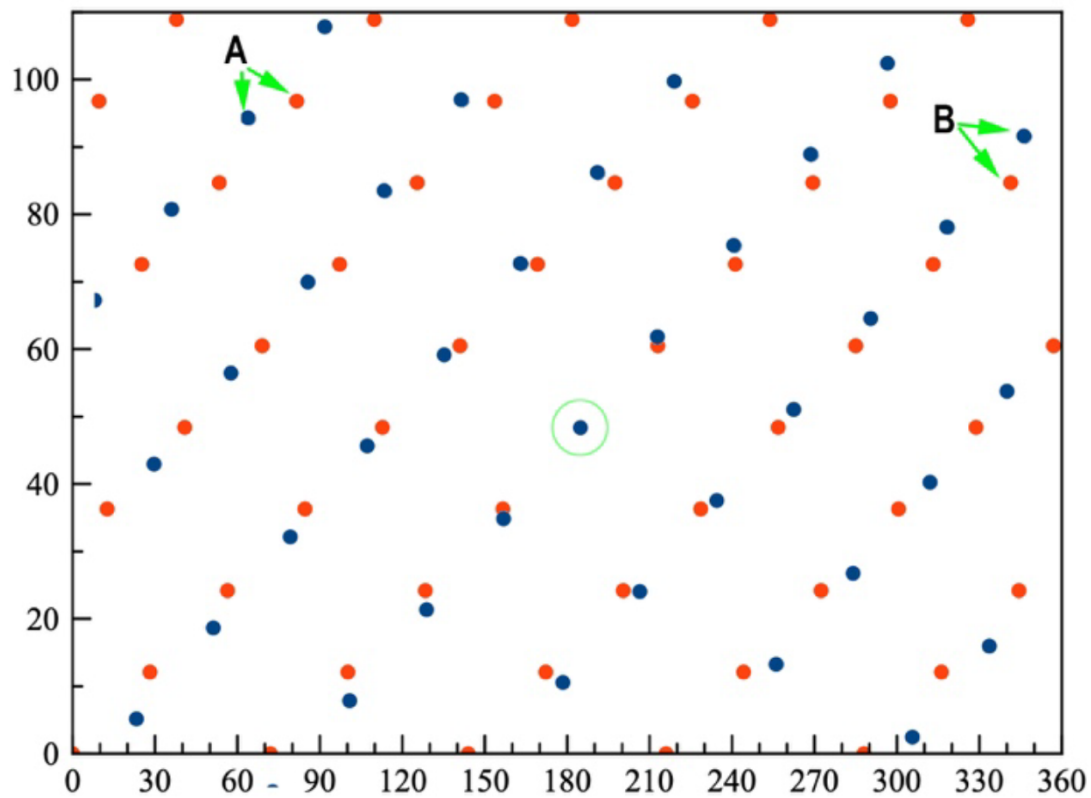
Figure S3. Helical net comparison of 1-start and C5 symmetries, Related to Figure 3.
Helical nets were obtained by unrolling the surface of a cylinder surrounding the filaments with the convention that we are looking at the outside of the unrolled cylindrical surface. The 1-start helical symmetry (pKpQIL) is shown in blue dots and the C5 symmetry (pED208) is shown in red dots. The two lattices are aligned so that the subunits within the green circle are superimposed.

Intermolecular interfaces	n:n+5	n:n+9	n:n+4	n:n+14	n:n+1
Buried Surface Area (Å²)	1085.4	331.6	236.5	133.2	74.2

Table S1. Buried surface area of the intermolecular interfaces, Related to Figure 2.