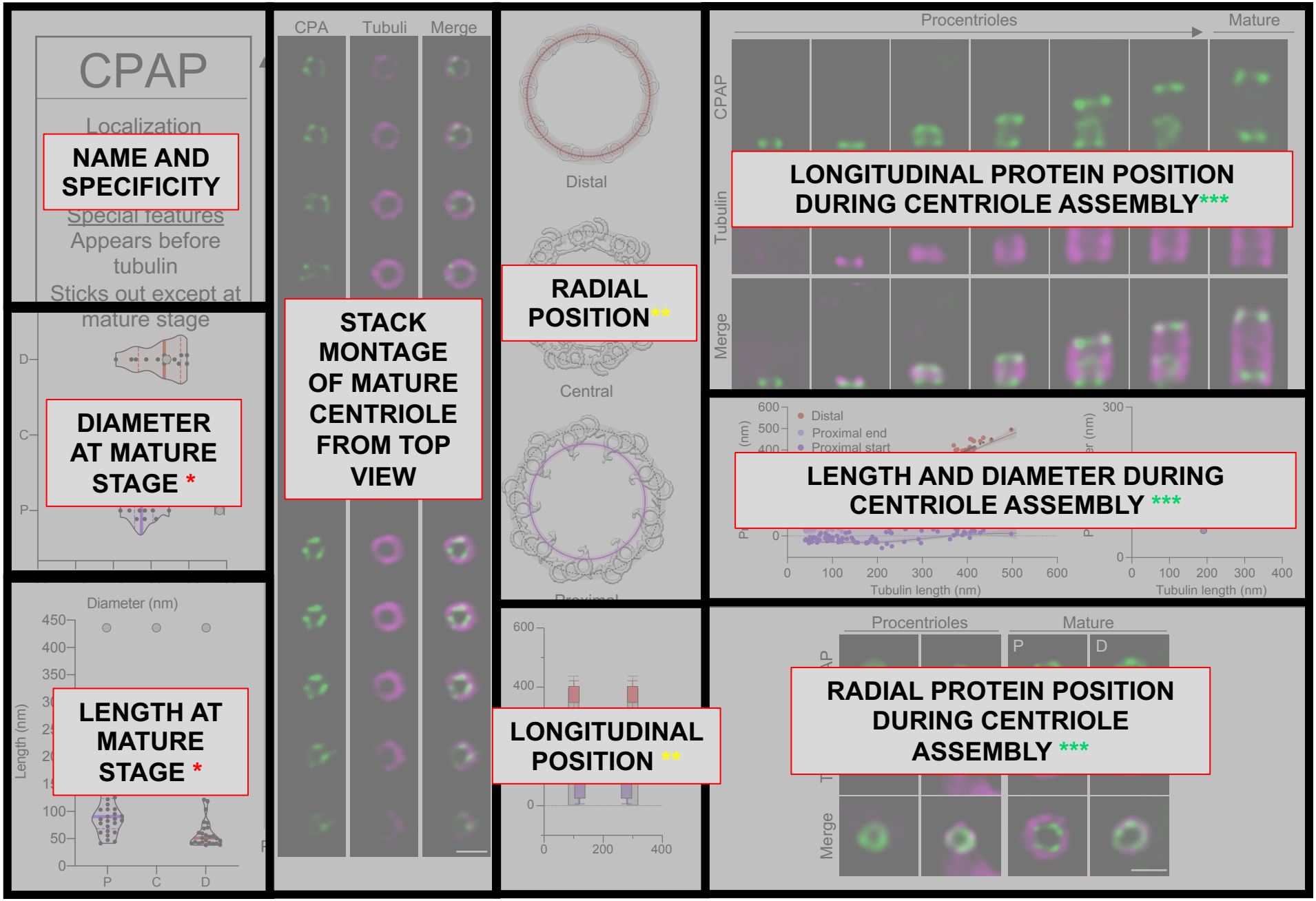
Data S1.
Identity cards of the proteins studied in this article (related to Figures 1 to 7)
Detailed features of the antibodies used in this article (related to STAR Methods)

Cards guideline (example of CPAP)



* = Absent in PLK4, SAS6 and STIL ** = Absent in ^{Ac}Tubulin *** = Absent in CEP63, CEP152, POC1B and CEP164

^{Ac}Tubulin

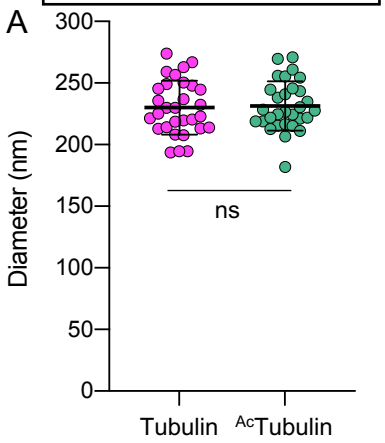
Localization

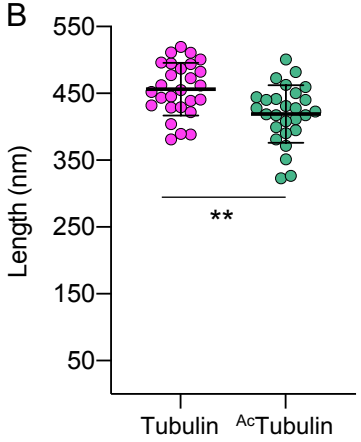
Proximal to distal

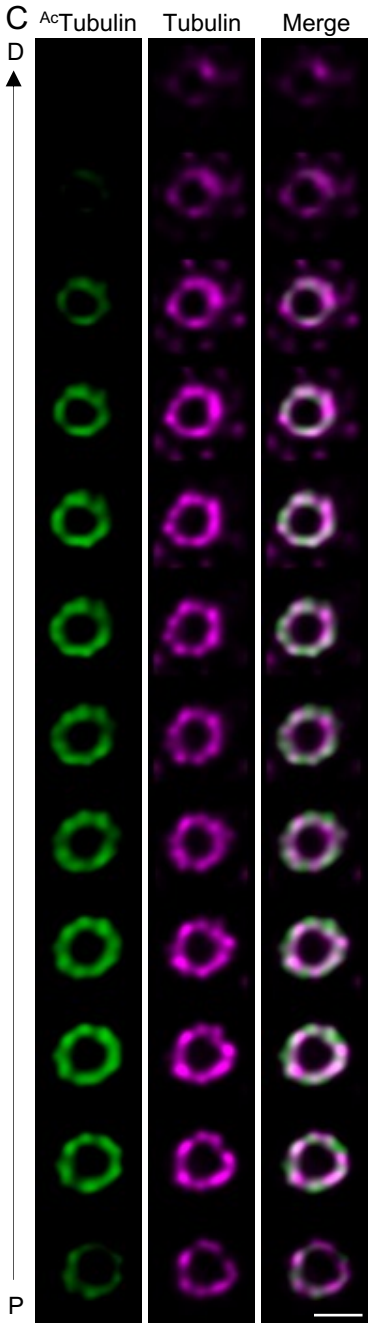
Special features

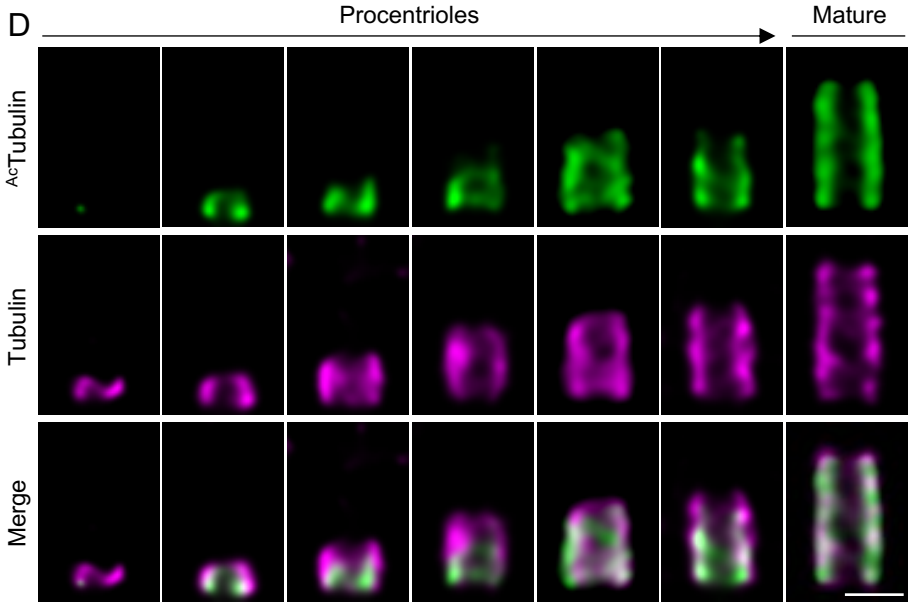
Diameter increase

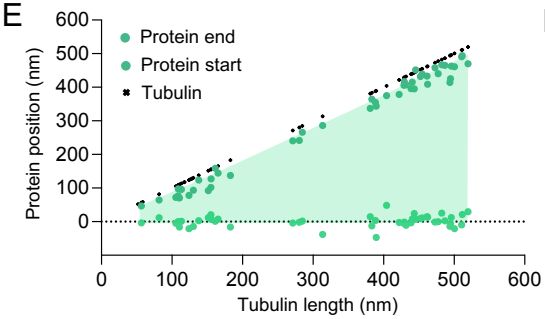
Absent from distal end

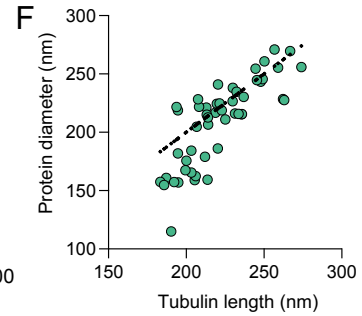


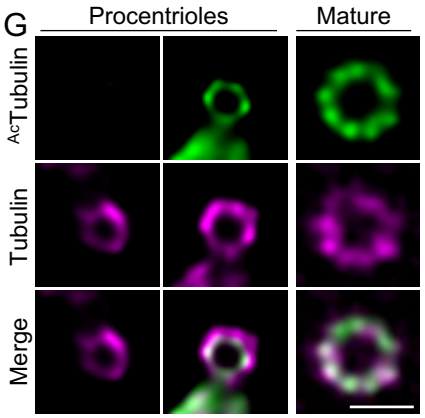


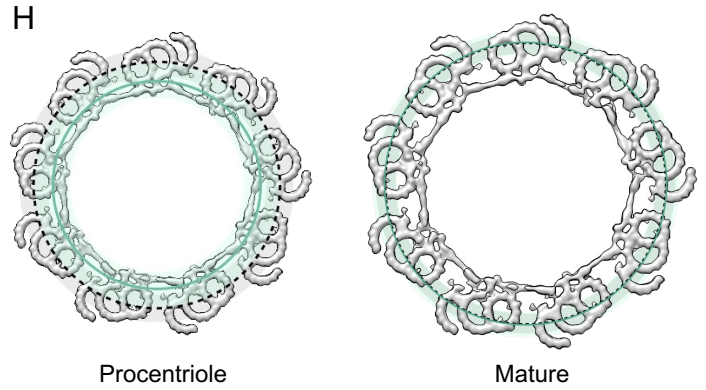










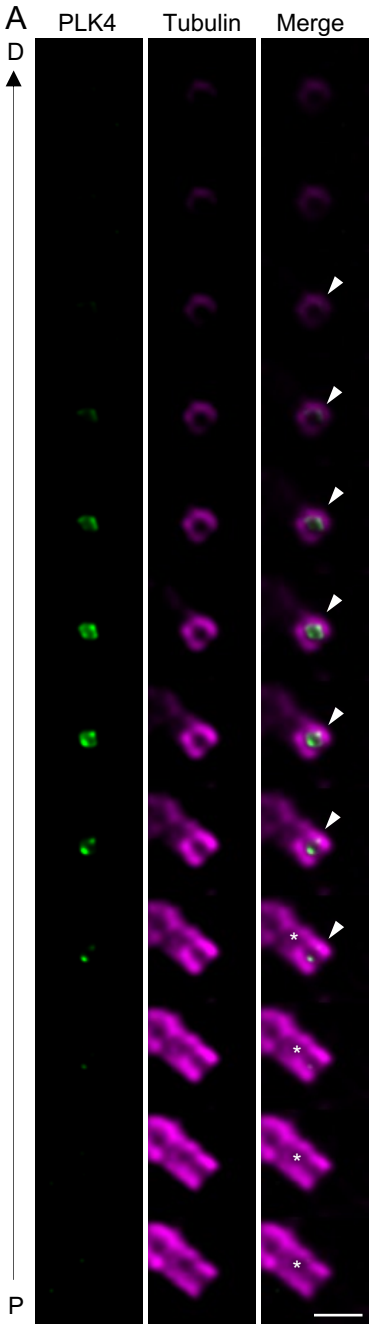


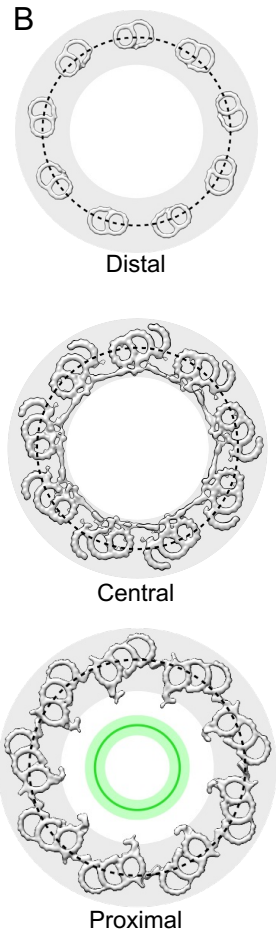
Acetylated tubulin. (**A**) Measurements of tubulin (magenta) and acetylated tubulin (^{Ac}Tubulin, green) diameters from side views of mature centrioles. Average +/- SD: Tubulin= 230.1 +/- 21.9 nm, ^{Ac}Tubulin= 231.3 +/- 20.0 nm. n= 30 centrioles from 3 independent experiments for each condition. (**B**) Measurements of tubulin (magenta) and ^{Ac}Tubulin (green) lengths from side views mature centrioles. Average +/- SD : Tubulin= 456.3 +/- 39.4 nm, ^{Ac}Tubulin= 419.1 +/- 43.2 nm. n= 27 centrioles from 3 independent experiments for each condition. **p=0.0017, Unpaired t-test. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and ^{Ac}Tubulin (green). The merge channel shows the perfect overlay of the tubulin and ^{Ac}Tubulin all along the centriole except at the very distal tip where ^{Ac}Tubulin is missing. Scale bar: 200 nm. Z-step : 35 nm. (**D**) Image of centrioles during assembly and at mature stage stained for tubulin (magenta) and ^{Ac}Tubulin (green). The frieze shows that ^{Ac}Tubulin appearance is delayed compared to tubulin and this delay is kept during the procentriole assembly until mature stage. Scale bar: 200 nm. (**E**) Evolution of ^{Ac}Tubulin position relative to tubulin growth during procentriole assembly. (**F**) Diameter evolution of ^{Ac}Tubulin during centriole assembly (relative to tubulin length), showing an increase in diameter from procentriole to mature centriole. (**G**) Images of procentrioles and mature centriole seen from top view showing the increase in diameter quantified in G. Scale bar : 200 nm. (**H**) Representation of the radial position of ^{Ac}Tubulin relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the MTT wall diameter of procentriole and mature centriole in the central region. The green circle corresponds to the diameter of ^{Ac}Tubulin based on measurements presented in G and normalized on the average tubulin diameter. Average +/- SD: Tubulin mature= 180 +/- 17.1 nm, ^{Ac}Tubulin mature=180.9 +/- 15.6 nm, Tubulin procentriole (normalized) = 100 +/- 11.3 nm, ^{Ac}Tubulin procentriole (normalized) =84.3 +/- 14.7 nm. n=30 and 21 for mature centrioles and procentrioles respectively.

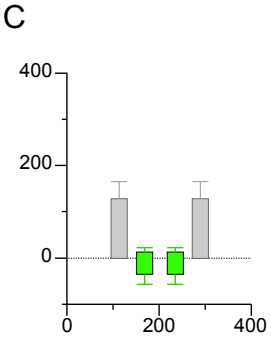
PLK4

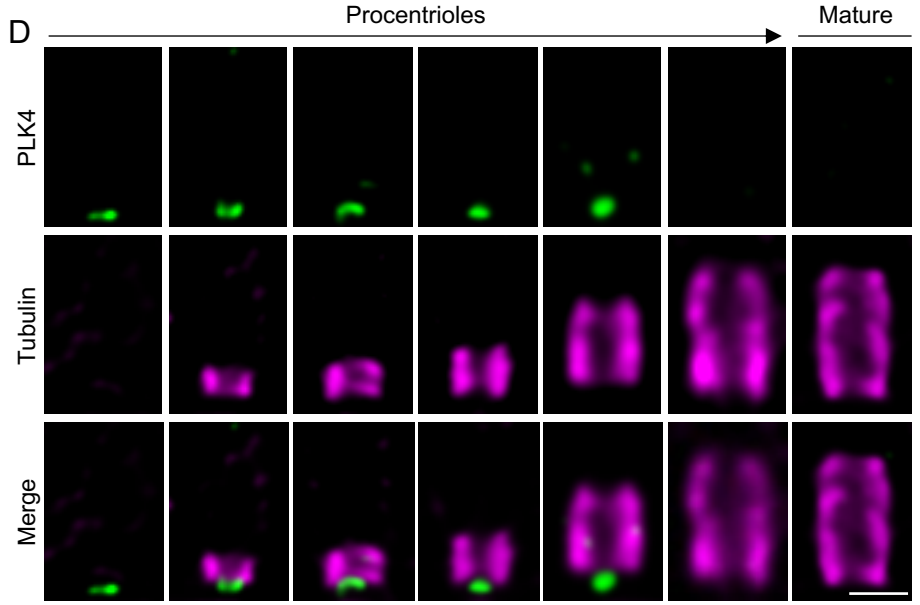
Localization
Proximal

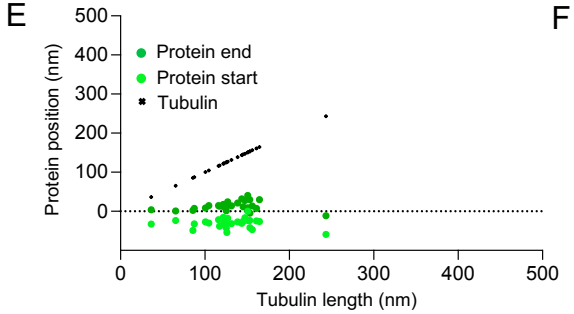
Special features
Appears before tubulin
Disappears during assembly

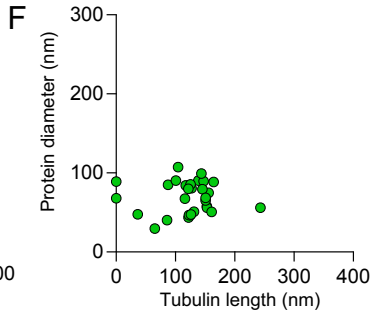


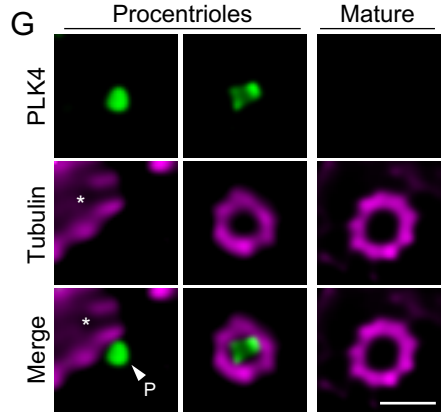










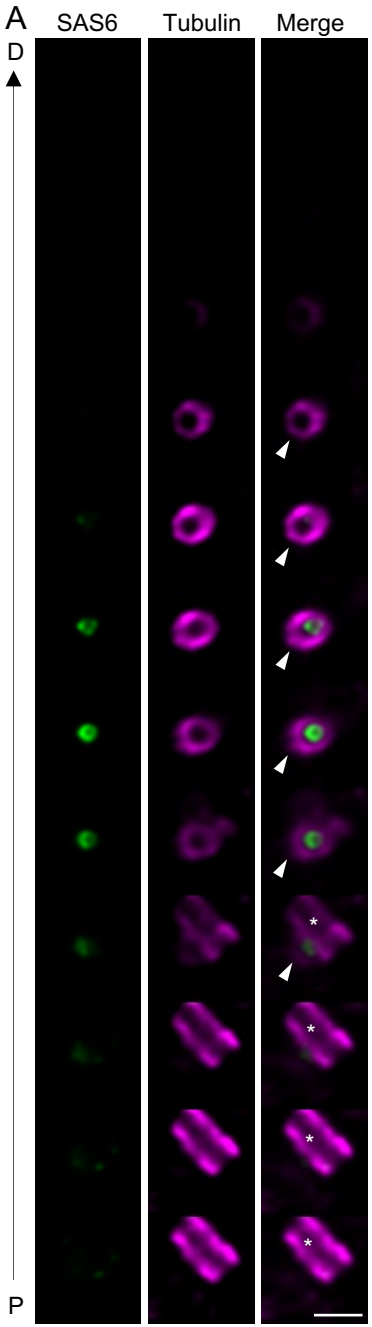


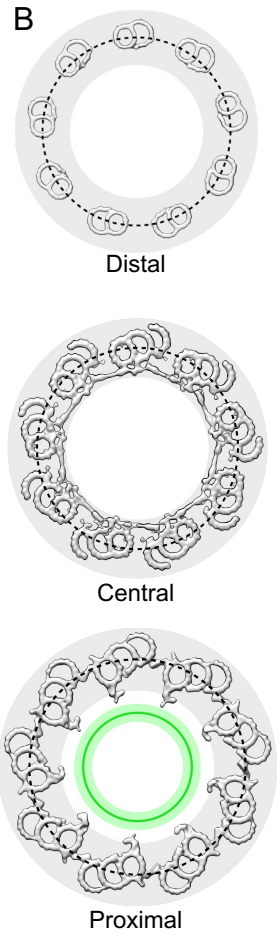
PLK4. (**A**) Image montage through the z-axis of top view procentriole (arrowhead) on top of a side view mature centriole (asterisk) stained for tubulin (magenta) and PLK4 (green). The merge channel shows the presence of PLK4 at the level of procentriole only. Scale bar: 200 nm. Z-step : 35 nm. (**B**) Representation of the radial position of PLK4 relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the procentriole diameter in the proximal, central and distal regions. Green circle corresponds to the diameter of PLK4 based on measurements presented in G and normalized to the average tubulin diameter. Average +/- SD: Tubulin (normalized): 100 +/- 8, PLK4 (normalized) = 39.3 +/- 9.3. n=23 centrioles from 3 independent experiments for each condition. (**C**) Radial and longitudinal positions of PLK4 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 130 +/- 37 nm, PLK4 start=-30.6 +/- 12.5 nm, PLK4 end=13.7 +/- 11.6 nm. (**D**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and PLK4 (green). The frieze shows that PLK4 appears prior to tubulin and disappears during late procentriole assembly before mitosis. Scale bar: 200 nm. (**E**) Evolution of position of PLK4 relative to tubulin growth during procentriole assembly. (**F**) Diameter evolution of PLK4 during centriole assembly (relative to tubulin length). (**G**) Images of procentrioles and mature centriole seen from top view. Asterisk shows the mature centriole from side view next to the procentriole (P, arrowhead). Scale bar: 200 nm.

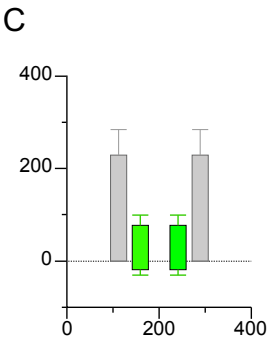
SAS6

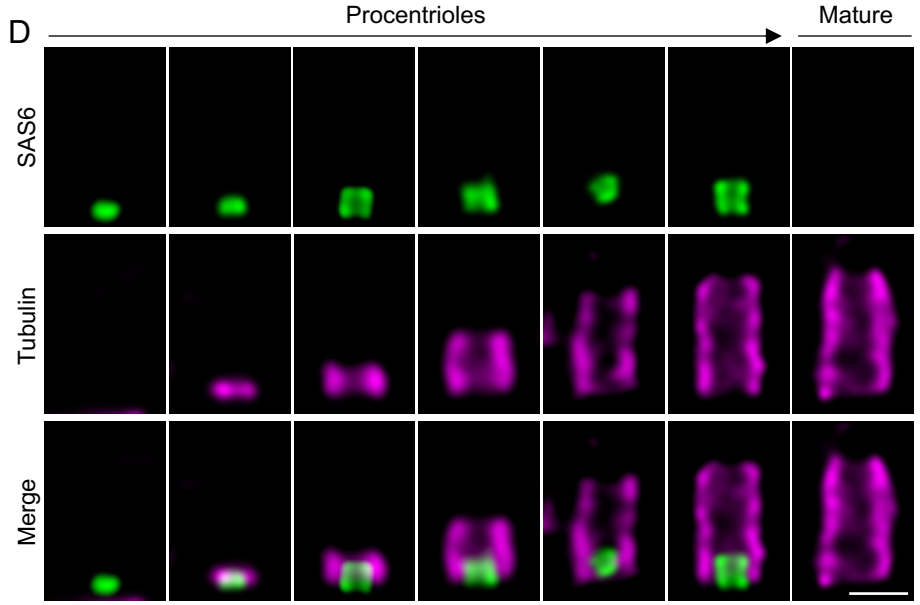
Localization
Proximal

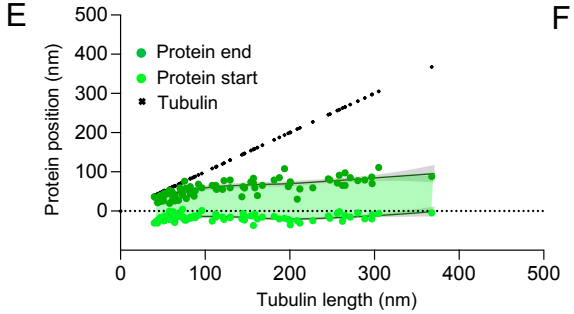
Special features
Appears before tubulin
Sticks out
Disappears at mitosis

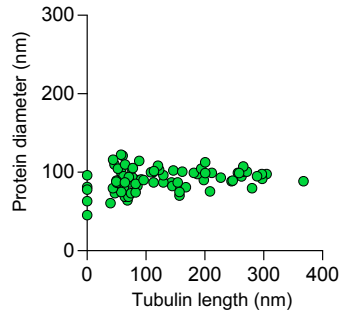


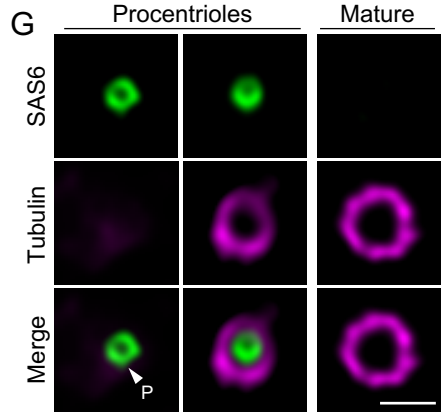










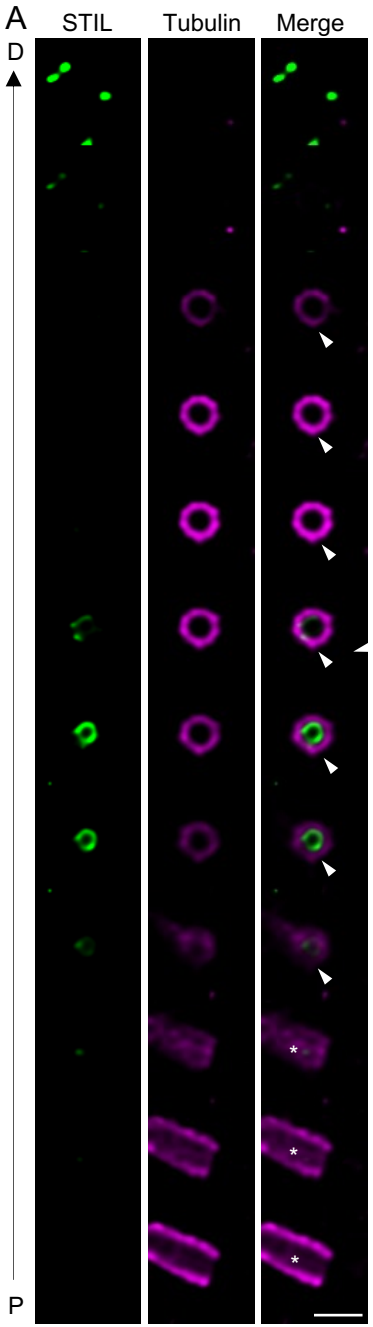


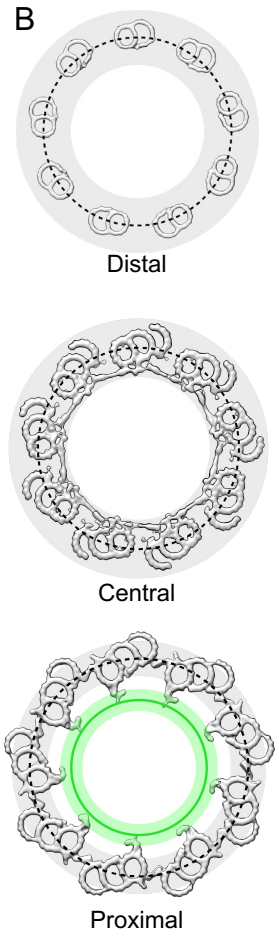
SAS6. (**A**) Image montage through the z-axis of a top view procentriole (arrowhead) on top of a side view mature centriole (asterisk) stained for tubulin (magenta) and SAS6 (green). The merge channel shows the presence of SAS6 at the level of procentriole only. Scale bar: 200 nm. Z-step: 35 nm. (**B**) Representation of the radial position of SAS6 relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the procentriole's diameter in the proximal, central and distal regions. Green circle corresponds to the diameter of SAS6 based on measurements presented in G and normalized to the average tubulin diameter. Average +/- SD: Tubulin (normalized): 100 +/- 14, SAS6 (normalized) = 50.3 +/- 8.3. n=70 centrioles from 3 independent experiments for each condition. (**C**) Radial and longitudinal positions of SAS6 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 230 +/- 55 nm, SAS6 start=-16.6 +/- 9.0 nm, SAS6 end =75.0 +/- 17.4 nm. (**D**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and SAS6 (green). The frieze shows that SAS6 appears prior to tubulin and disappears during late procentriole assembly in mitosis. Scale bar: 200 nm. (**E**) Evolution of position of SAS6 relative to tubulin growth during procentriole assembly. The green region depicts the region of the centriole which is covered by SAS6 signal. (**F**) Diameter evolution of SAS6 during centriole assembly (relative to average tubulin length). (**G**) Images of procentrioles and mature centriole seen from top view. The procentriole (P) is indicated by an arrowhead. Scale bar: 200 nm.

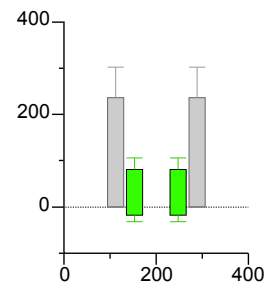
STIL

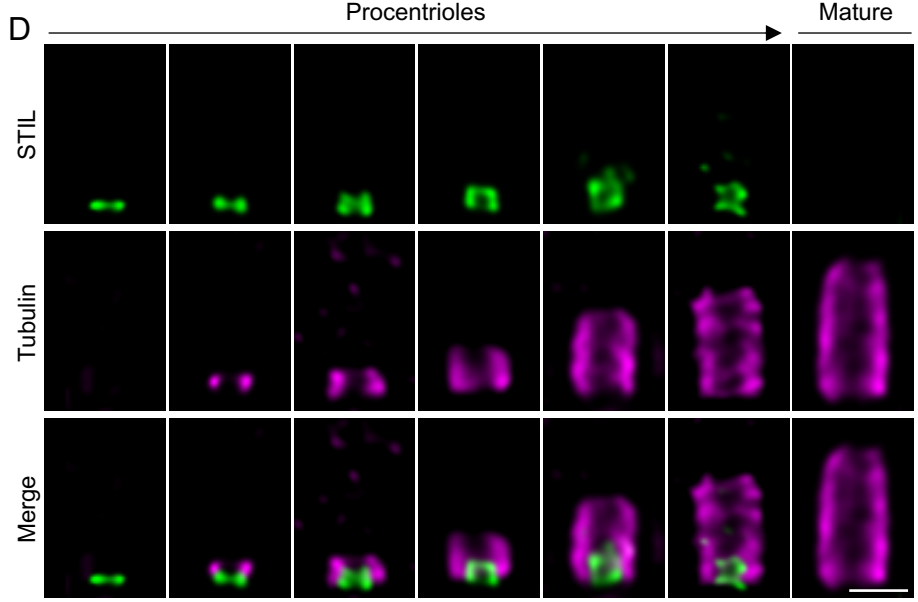
Localization
Proximal

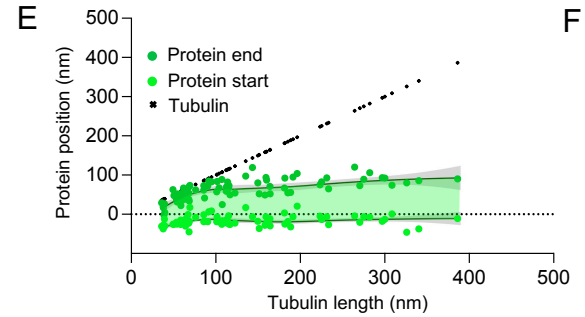
Special features
Appears before tubulin
Sticks out
Disappears at mitosis

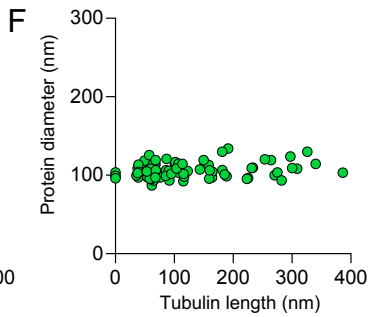


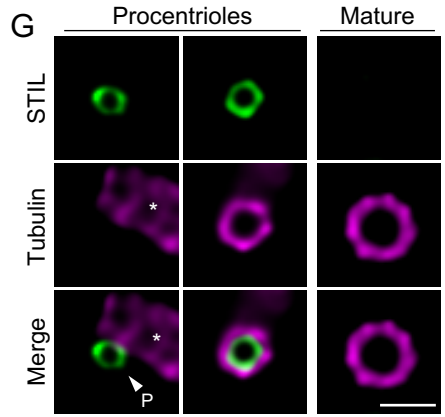










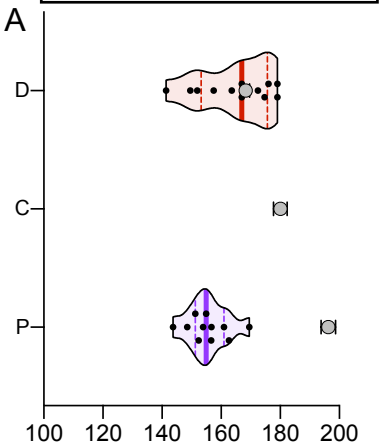


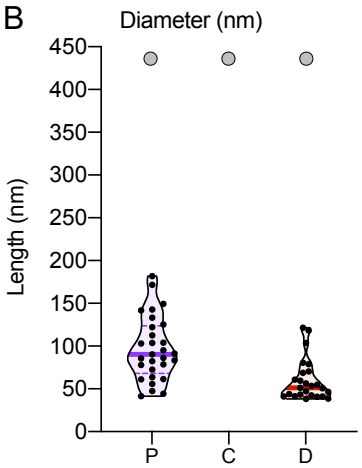
STIL. (**A**) Image montage through the z-axis of a top view procentriole (arrowhead) on top of a side view mature centriole (asterisk) stained for tubulin (magenta) and STIL (green). The merge channel shows the presence of STIL at the level of procentriole only. Scale bar: 200 nm. Z-step : 35 nm. (**B**) Representation of the radial position of STIL relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the procentriole diameter in the proximal, central and distal regions. Green circle corresponds to the diameter of STIL based on measurements presented in G and normalized on the average tubulin diameter. Average +/- SD: Tubulin (normalized): 100 +/- 16, STIL (normalized) = 61.7 +/- 9.5. n=76 centrioles from 3 independent experiments for each condition. (**C**) Radial and longitudinal positions of STIL relative to the normalized tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 237 +/- 66 nm, STIL start=-16.4 +/- 12.3 nm, STIL end=77.4 +/- 20.2 nm. (**D**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and STIL (green). The frieze shows that STIL appears prior to tubulin and disappear during late procentriole assembly during mitosis. Scale bar: 200 nm. (**E**) Evolution of the position of STIL relative to tubulin growth during procentriole assembly. The green region depicts the region of the centriole which is covered by STIL signal. (**F**) Diameter evolution of STIL during centriole assembly (relative to average tubulin length). (**G**) Images of procentrioles and mature centriole seen from top view. Asterisk shows the mature centriole from side view next to the procentriole (P, arrowhead). Scale bar: 200 nm.

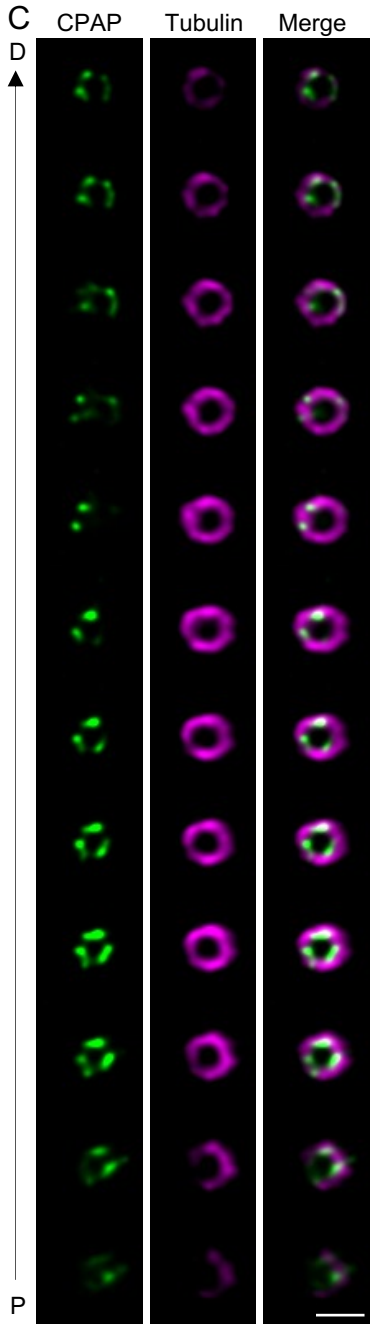
CPAP

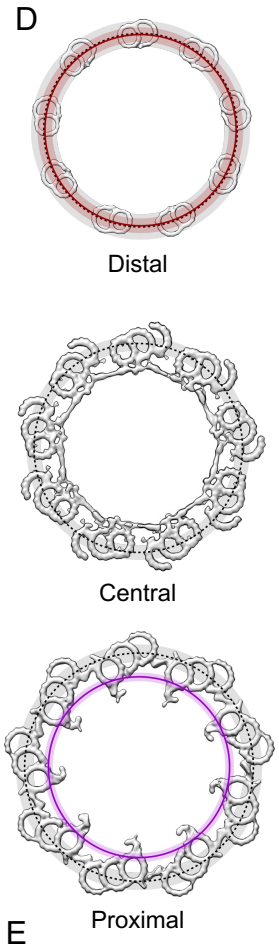
Localization
Proximal + distal

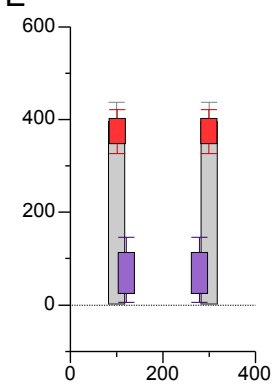
Special features
Appears before tubulin
Sticks out except at mature stage

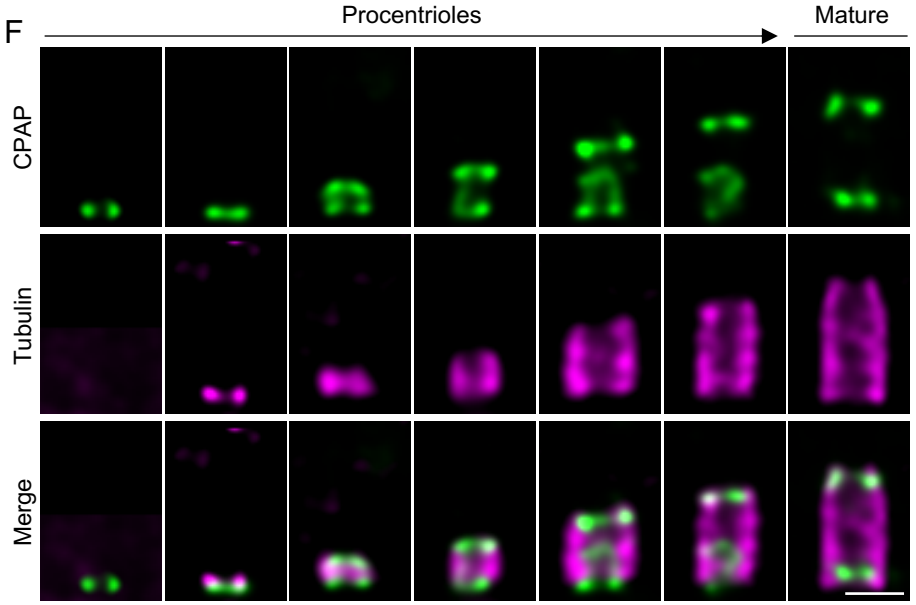


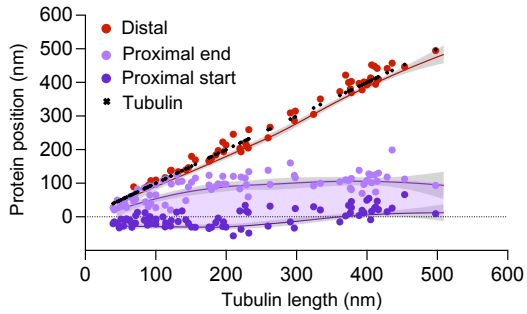


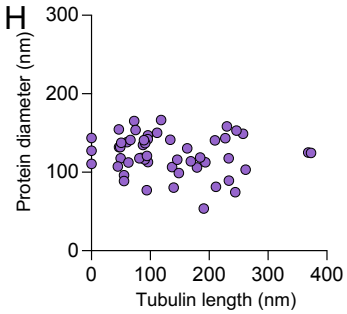


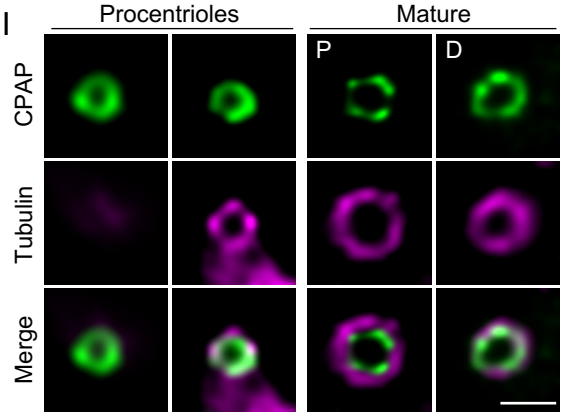












CPAP. (**A**) Measurements of CPAP diameters in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CPAP P= 155.6 +/- 7.1, CPAP D= 164.9 +/- 12.4. n= 60, 55, 223, 11 and 12 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D, CPAP P, CPAP D respectively. (**B**) Measurements of CPAP lengths in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CPAP P= 96.9 +/- 37 nm, CPAP D= 59.8 +/- 24 nm n= 246, 29 and 25 centrioles from 3 independent experiments for tubulin, CPAP P and CPAP D respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CPAP (green). The merge channel shows that CPAP is slightly internal to tubulin in the proximal region and perfectly overlapping at the distal tip. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CPAP relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. The magenta circle corresponds to the diameter of CPAP in the proximal region and the red circle corresponds to the diameter of CPAP in the distal region. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CPAP P= 156 +/- 7, CPAP D= 165 +/- 12. n= 60, 55, 223, 11 and 12 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D, CPAP P, CPAP D respectively. (**E**) Radial and longitudinal positions of CPAP relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 393 +/- 42 nm, CPAP P start=23 +/- 20 nm, CPAP P end= 111 +/- 34, CPAP D start= 348 +/- 41, CPAP D end= 402 +/-3. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and CPAP (green). The frieze shows that CPAP appears prior to tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the start and end position of proximal and distal CPAP relative to tubulin growth during procentriole assembly. The growth of proximal CPAP was represented as loess curve (purple lines). The purple region depicts the region of the centriole which is covered by CPAP signal. (**H**) Diameter evolution of proximal CPAP during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Mature centrioles are shown in the proximal (P) and the distal (D) depicting the two localizations of CPAP. Scale bar: 200 nm.

CEP44

Localization
Proximal

Special features
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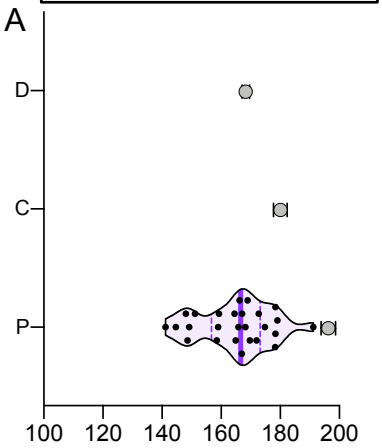
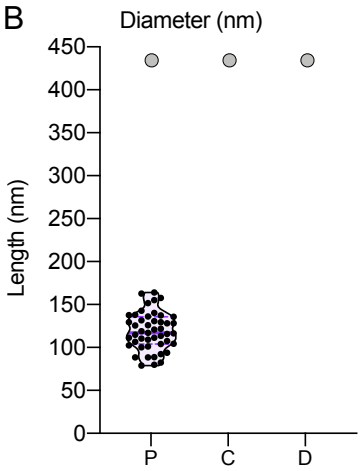
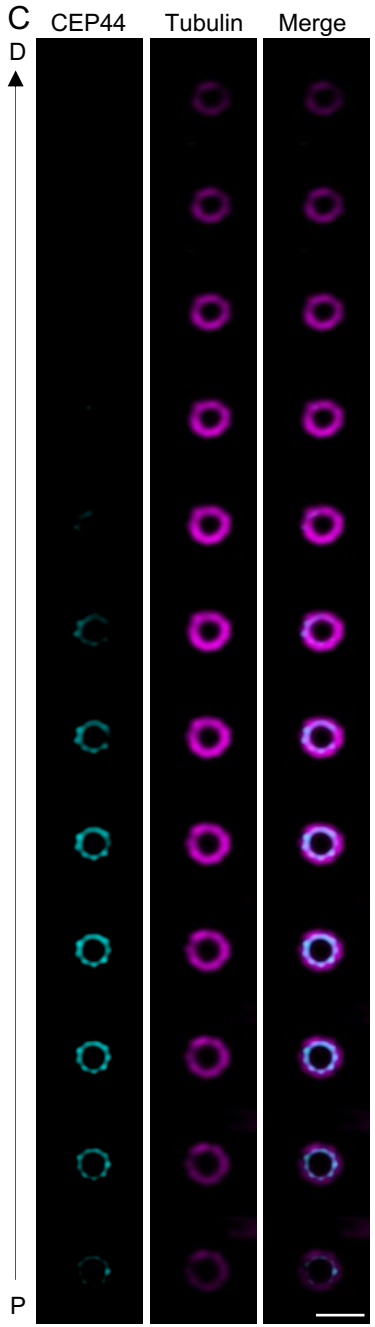
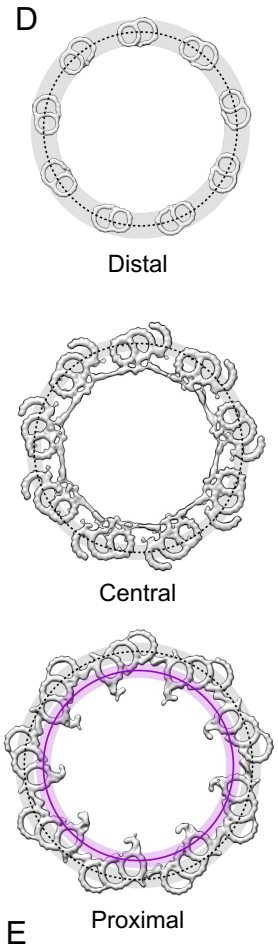
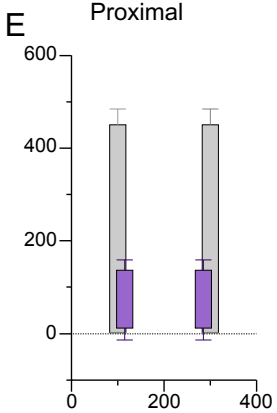
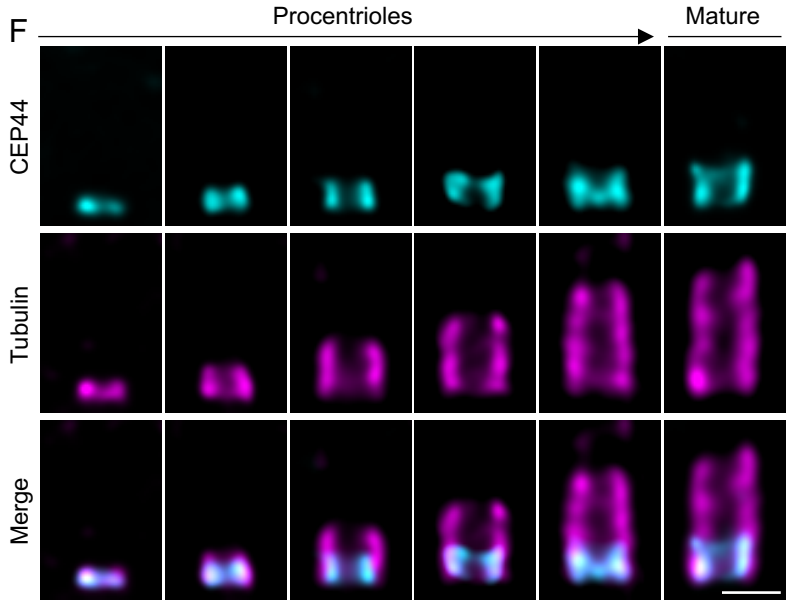


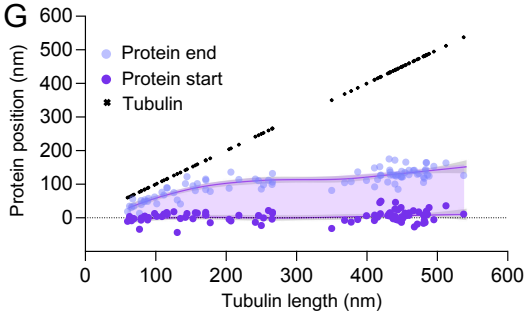


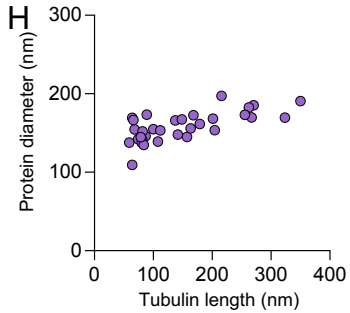


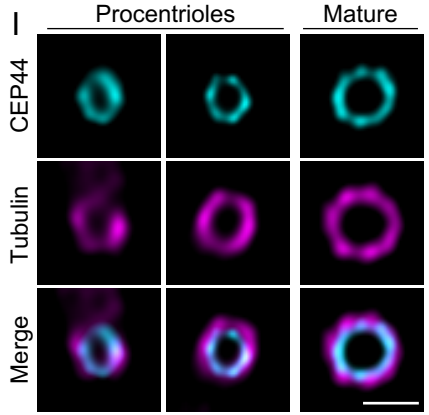










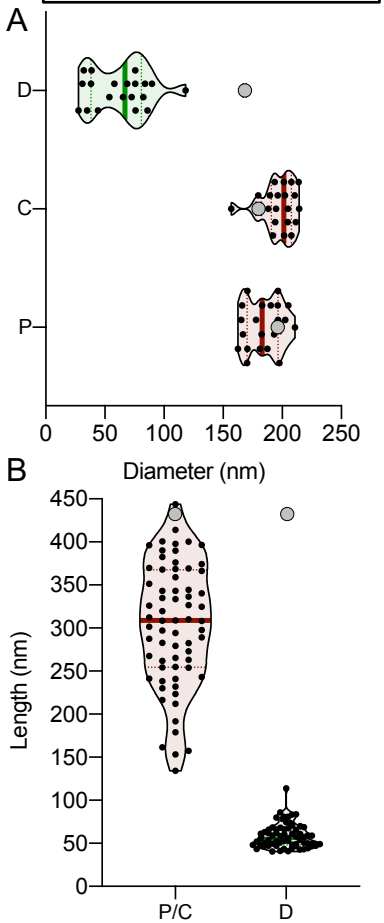


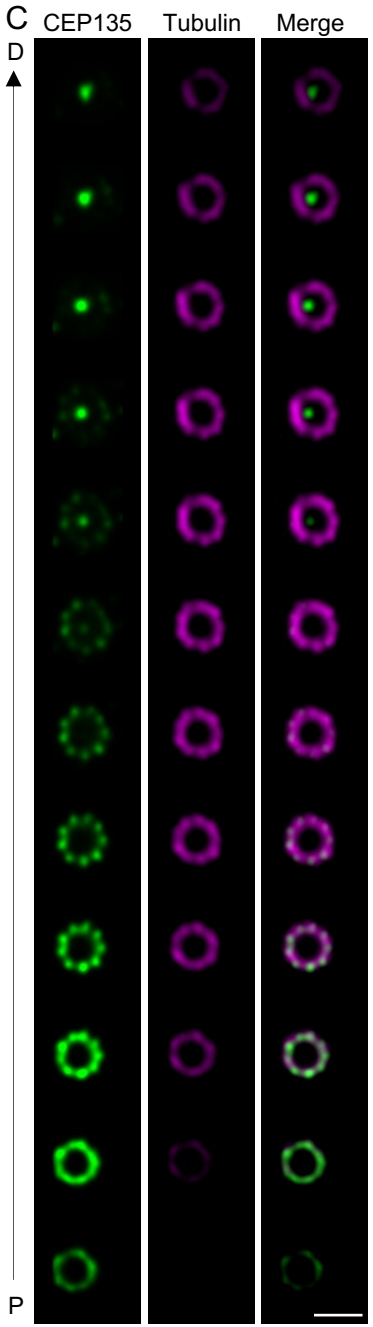
CEP44. (**A**) Measurement of CEP44 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP44= 164.9 +/- 12.3 nm. n= 60, 55, 223 and 26 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP44 respectively. (**B**) Measurement of CEP44 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CEP44= 118.9 +/- 21.8 nm. n= 246 and 47 centrioles from 3 independent experiments for tubulin and CEP44 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP44 (cyan). The merge channel shows that CEP44 is slightly internal to tubulin, restricted to the proximal region. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP44 (purple) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP44= 165 +/- 13. n= 60, 55, 223 and 26 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP44 respectively. (**E**) Radial and longitudinal positions of CEP44 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 447 +/- 37 nm, CEP44 start= 8 +/- 18 nm, CEP44 end= 130 +/- 21. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and CEP44 (cyan). The frieze shows that CEP44 appears together tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the start and end position of CEP44 relative to tubulin growth during procentriole assembly. The growth of CEP44 was represented as loess curve (purple lines). The purple region depicts the region of the centriole which is covered by CEP44 signal. (**H**) Diameter evolution of proximal CEP44 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar : 200 nm.

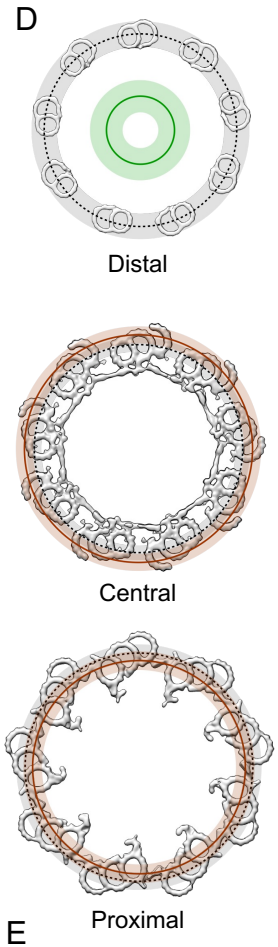
CEP135

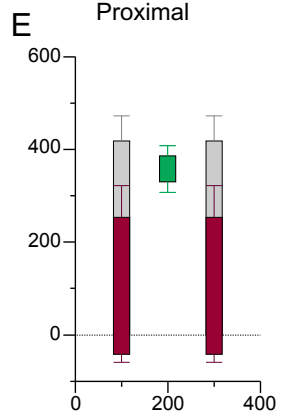
Localization
Proximal to distal

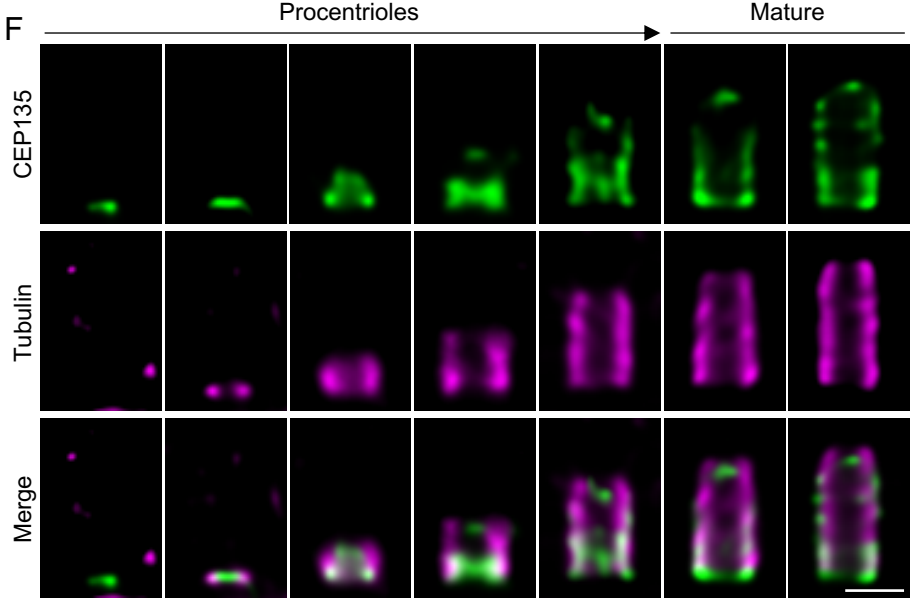
Special features
Appears before tubulin
Sticks out only at mature stage

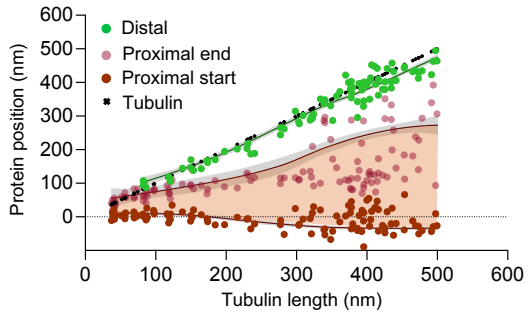


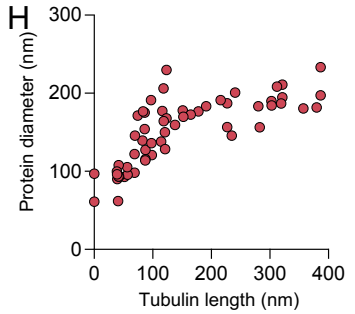


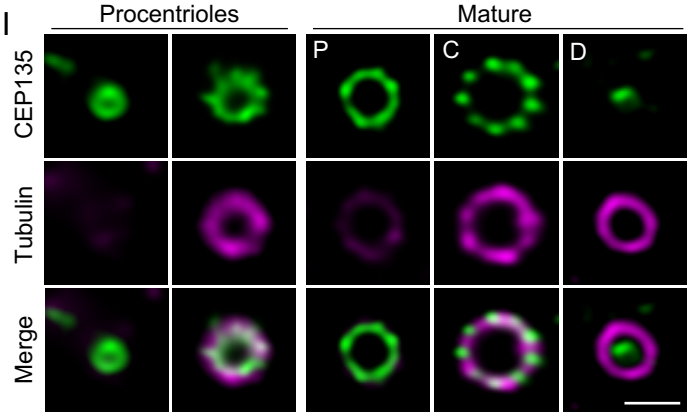










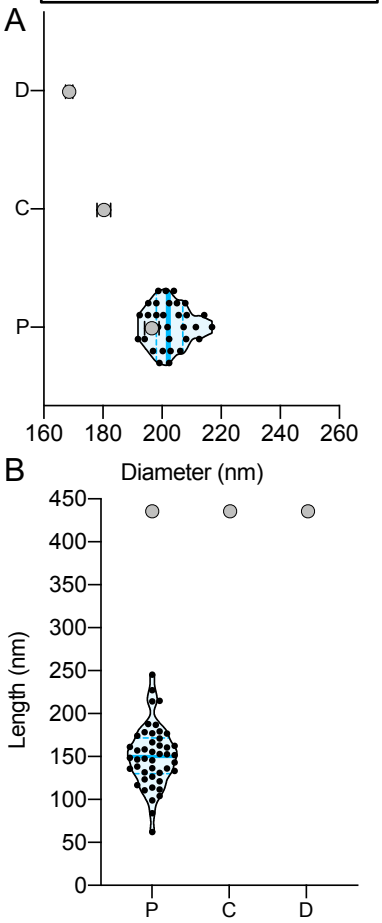


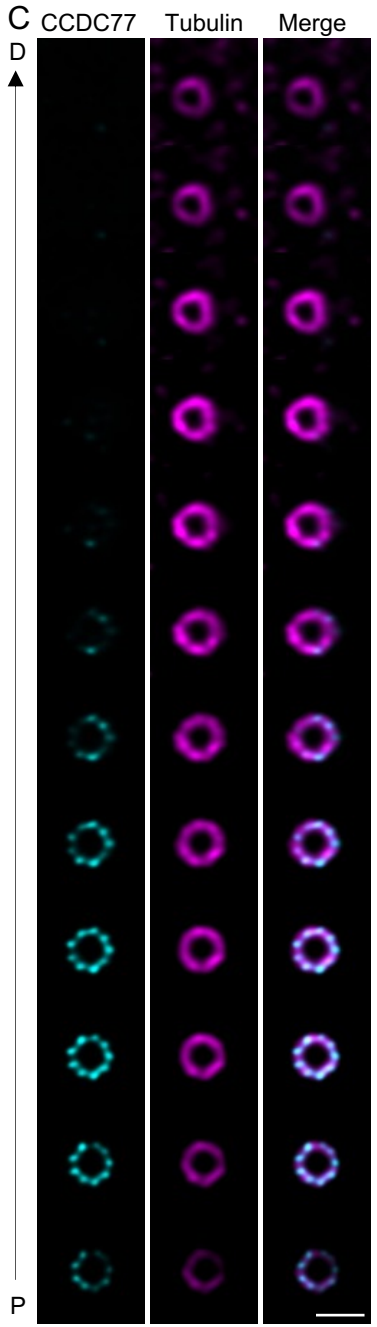
CEP135. (**A**) Measurements of CEP135 diameters in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP135 P= 184.4 +/- 14.7, CEP135 C=197.4 +/- 13.8, CEP135 D= 62.6 +/- 24. n= 60, 55, 223, 21, 21 and 20 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D, CEP135 P, CEP135 C and CEP135 D respectively. (**B**) Measurements of CEP135 lengths in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CEP135 P= 304.8 +/- 72 nm, CEP135 D= 58.5.8 +/- 13.8 nm. n= 246, 68 and 68 centrioles from 3 independent experiments for tubulin, CEP135 P/C and CEP135 D respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP135 (green). The merge channel shows that CEP135 perfectly overlaps with the tubulin in the proximal / central regions and forms a luminal dot at the distal tip. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP135 relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. The brown circles correspond to the diameter of CEP135 in the proximal and central regions and the green circle corresponds to the diameter of CEP135 in the distal region. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP135 P= 184 +/- 15, CEP135 C=197 +/- 14, CEP135 D= 59 +/- 28. n= 60, 55, 223, 21, 21 and 20 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D, CEP135 P, CEP135 C and CEP135 D respectively. (**E**) Radial and longitudinal positions of CEP135 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 415 +/- 55 nm, CEP135 P start=-41 +/- 15 nm, CEP135 P end= 251 +/- 67, CEP135 D start= 330 +/- 52, CEP135 D end= 385 +/-54. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and CEP135 (green). The frieze shows that CEP135 appears prior to tubulin and persists during procentriole assembly until mature stage where it forms a ring in the proximal region below the centriole. Scale bar: 200 nm. (**G**) Evolution of the start and end position of proximal (brown dots) and distal (green dots) CEP135 relative to tubulin growth during procentriole assembly. The growth of proximal CEP135 was represented as loess curve (brown lines). The brown region depicts the region of the centriole which is covered by CEP135 signal. (**H**) Diameter evolution of proximal CEP135 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Mature centrioles are shown in the proximal (P), the central (C) and the distal (D) regions depicting the different localizations of CEP135. Scale bar: 200 nm.

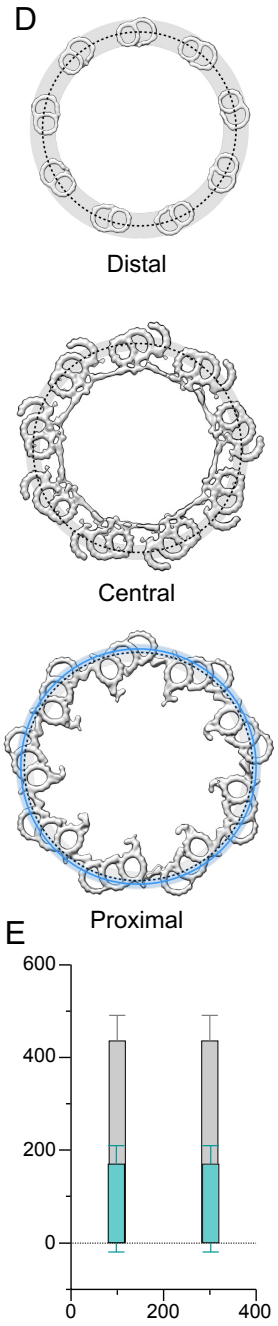
CCDC77

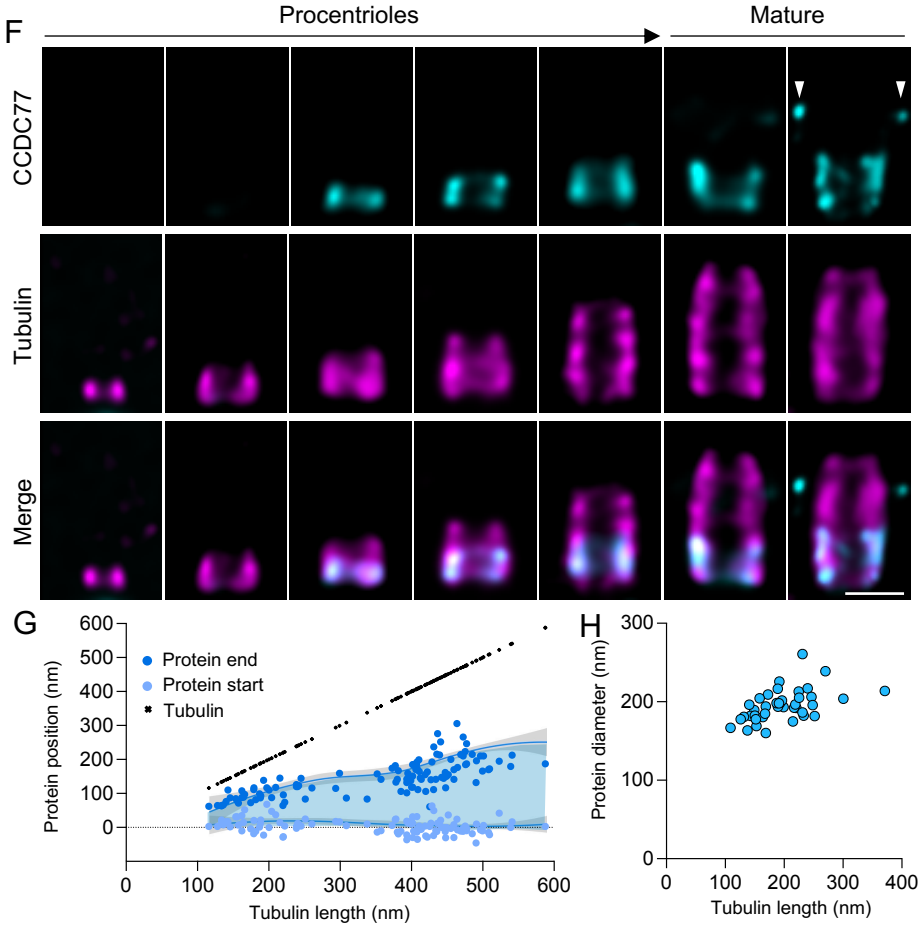
Localization
Proximal

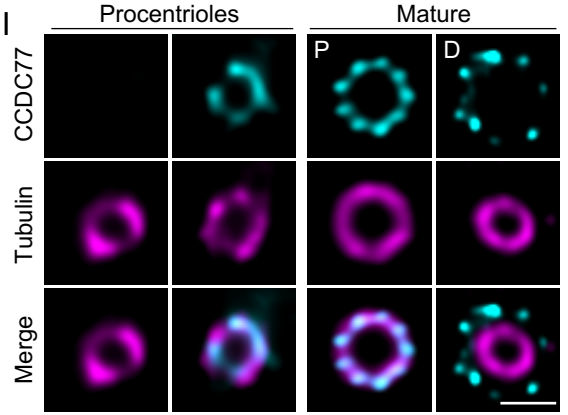
Special features
External distal torus only on mother centriole









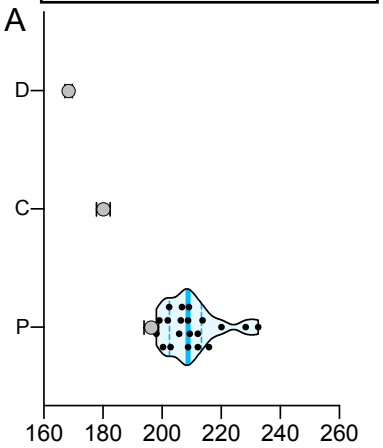


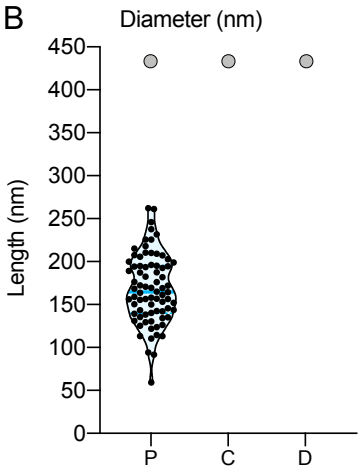
CCDC77. (**A**) Measurement of CCDC77 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CCDC77= 202.4 +/- 6.3. n= 60, 55, 223 and 32 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CCDC77 respectively. (**B**) Measurement of CCDC77 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CCDC77= 168.2 +/- 39.7 nm. n= 246 and 78 centrioles from 3 independent experiments for tubulin and CCDC77 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CCDC77 (cyan). The merge channel shows that CCDC77 perfectly overlaps with the tubulin and is restricted to proximal region. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CCDC77 (cyan) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CCDC77=203 +/- 6. n= 60, 55, 223 and 28 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CCDC77 respectively. (**E**) Radial and longitudinal positions of CCDC77 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 435 +/- 55 nm, CCDC77= 0 +/- 20 nm, CCDC77 end= 170 +/- 49 nm. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and CCDC77 (cyan). The frieze shows that CCDC77 appears slightly after tubulin and persists during procentriole assembly until mature stage. Note an additional distal localization of CCDC77 present only at mature stage (arrowhead). Scale bar: 200 nm. (**G**) Evolution of the start and end position of CCDC77 relative to tubulin growth during procentriole assembly. The growth of CCDC77 was represented as loess curve (blue lines). The cyan region depicts the region of the centriole which is covered by CCDC77 signal. (**H**) Diameter evolution of CCDC77 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Mature centrioles are shown in the proximal (P) and the distal (D) depicting the two localizations of CCDC77. Scale bar: 200 nm.

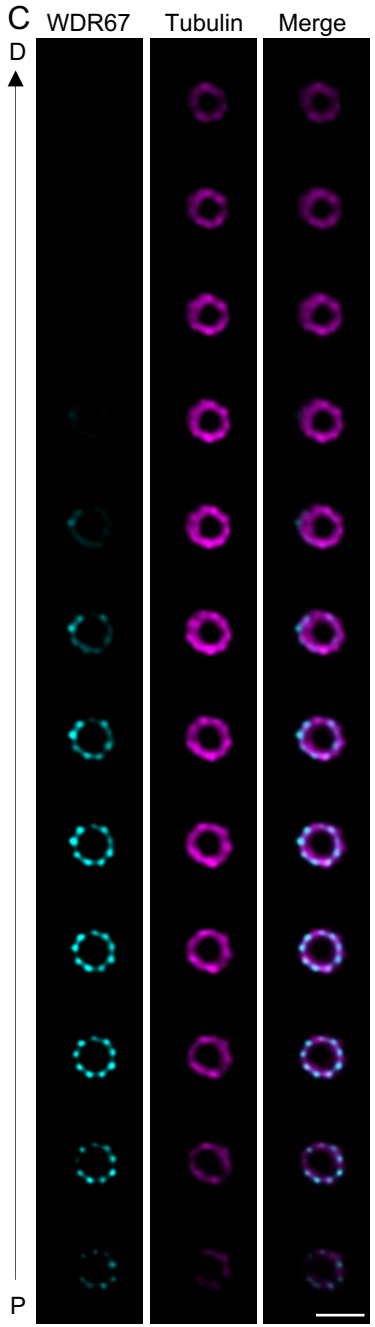
WDR67

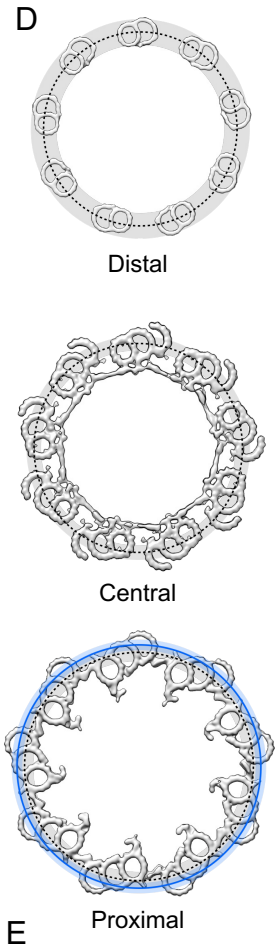
Localization
Proximal

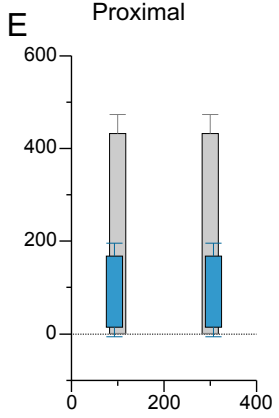
Special features
Dual proximal localization at mature centrioles

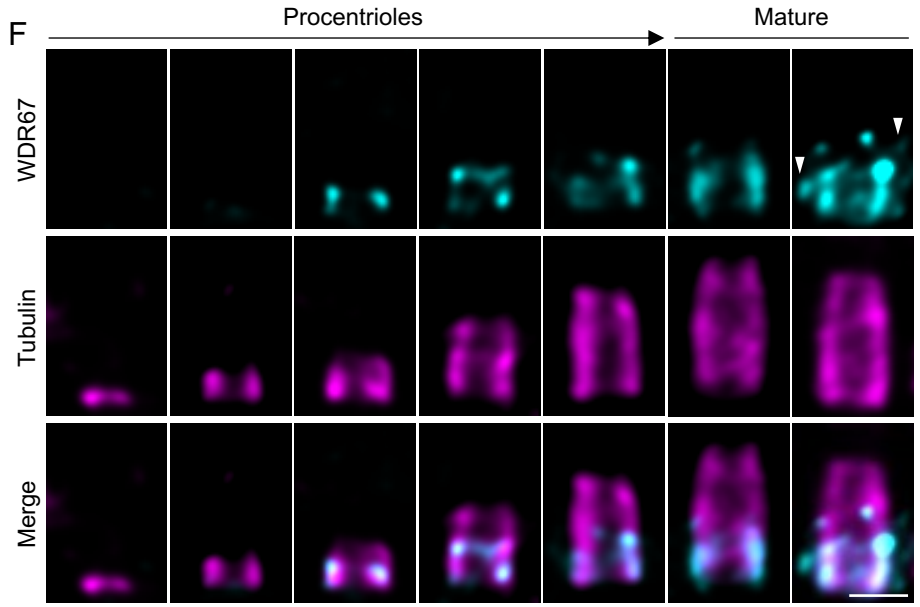


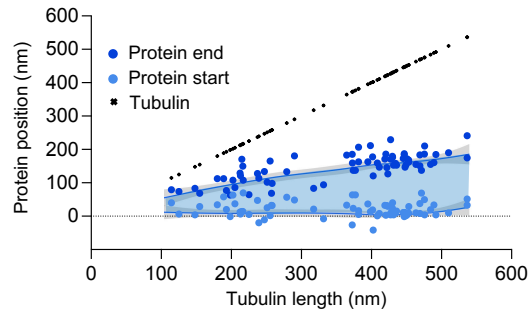


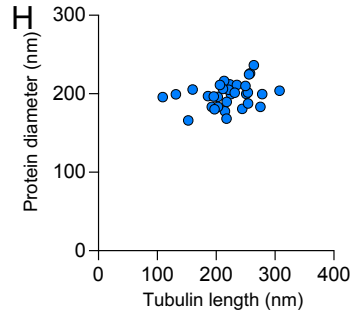


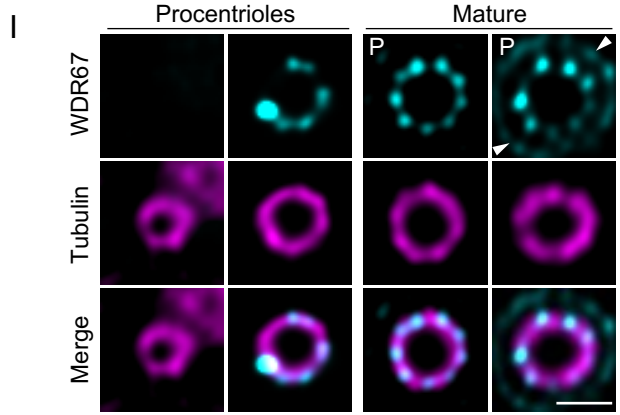












WDR67. (**A**) Measurement of WDR67 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, WDR67= 209.7 +/- 9.1 nm. n= 60, 55, 223 and 20 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and WDR67 respectively. (**B**) Measurement of WDR67 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, WDR67=150.5 +/- 35.7 nm. n= 246 and 46 centrioles from 3 independent experiments for Tubulin and WDR67 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and WDR67 (cyan). The merge channel shows that WDR67 perfectly overlaps with the tubulin and is restricted to proximal region. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of WDR67 (light blue) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, WDR67=208 +/- 6 nm. n= 60, 55, 223 and 18 from 3 independent experiments for tubulin P, tubulin C, tubulin D and WDR67 respectively. (**E**) Radial and longitudinal positions of WDR67 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 433+/- 45 nm, WDR67 start=17 +/- 22 nm, WDR67 end= 168 +/- 27. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and WDR67 (cyan). The frieze shows that WDR67 appears slightly after tubulin and persists during procentriole assembly until mature stage. Note an additional proximal localization of WDR67 present only at mature stage (arrowhead). Scale bar: 200 nm. (**G**) Evolution of the start and end position of WDR67 relative to tubulin growth during procentriole assembly. The growth of WDR67 was represented as loess curve (blue lines). The light blue region depicts the region of the centriole which is covered by WDR67 signal. (**H**) Diameter evolution of WDR67 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Mature centrioles images show the dual localizations of WDR67, both in the proximal region. Scale bar: 200 nm.

SPICE

Localization
Proximal

Special features
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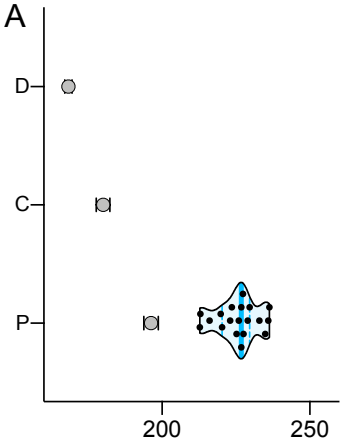

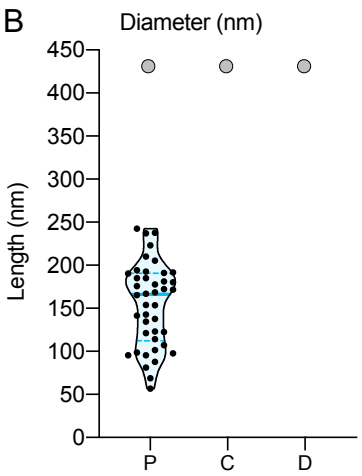

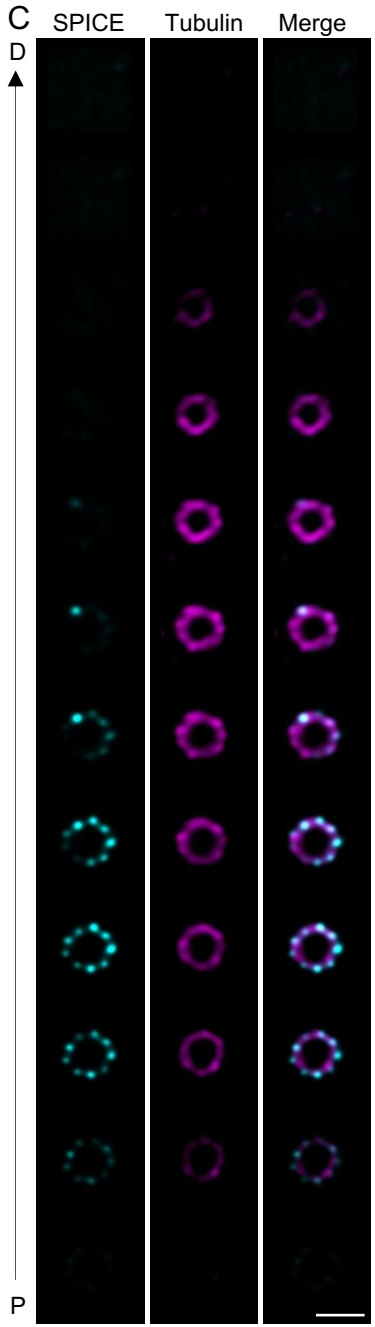

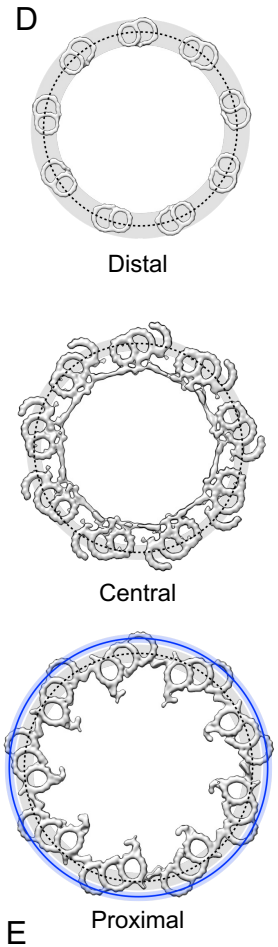

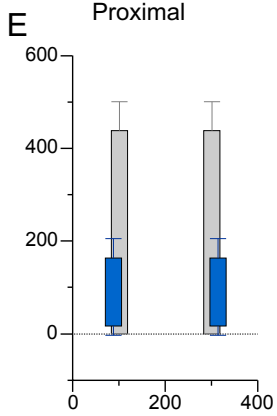

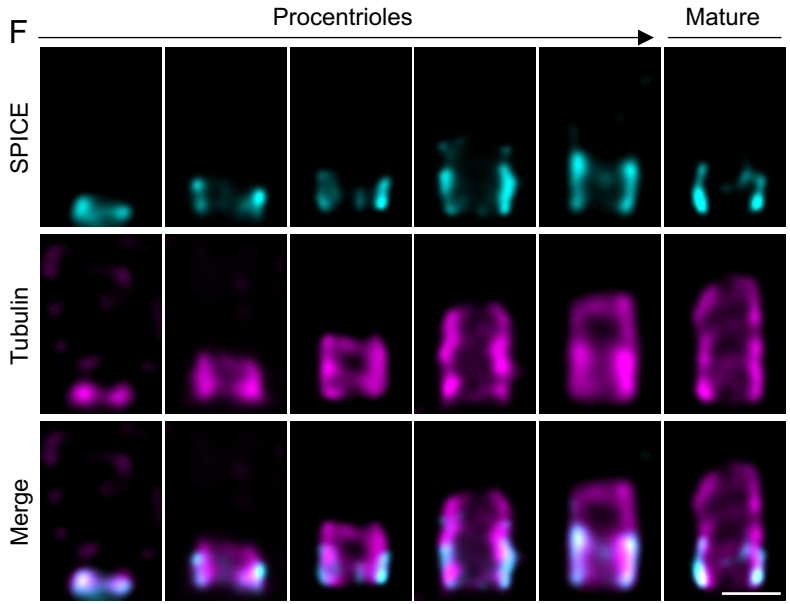

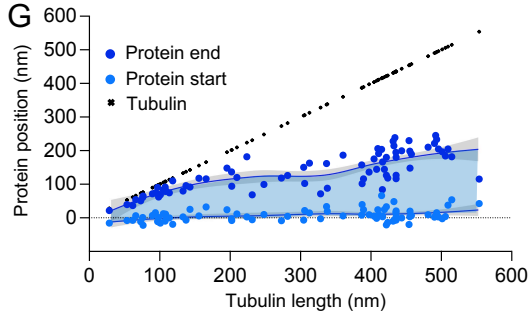

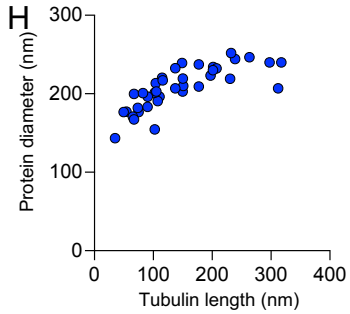

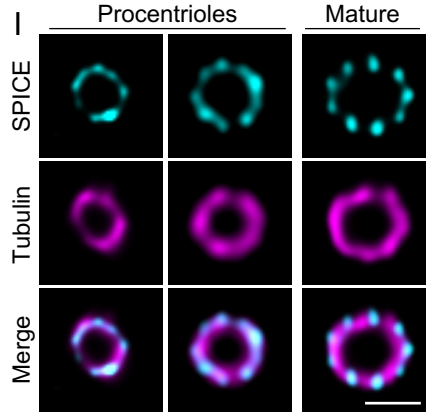

SPICE. (**A**) Measurement of SPICE diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, SPICE= 226+/- 7.0 . n= 60, 55, 223 and 19 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and SPICE respectively. (**B**) Measurement of SPICE length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, SPICE= 154.3 +/- 48.2 nm. n= 246 and 42 centrioles from 3 independent experiments for Tubulin and SPICE respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and SPICE (cyan). The merge channel shows that SPICE overlaps with the tubulin and is restricted to proximal region. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of SPICE (blue) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, SPICE=226 +/- 7 nm. n= 60, 55, 223 and 19 from 3 independent experiments for tubulin P, tubulin C, tubulin D and SPICE respectively. (**E**) Radial and longitudinal positions of SPICE relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 437+/- 60 nm, SPICE start=13 +/- 20 nm, SPICE end= 169 +/- 46. (**F**) Images of centrioles during assembly and at mature stage stained for Tubulin (magenta) and SPICE (cyan). The frieze shows that SPICE appears together with tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the start and end position of SPICE relative to tubulin growth during procentriole assembly. The growth of SPICE was represented as loess curve (blue lines). The blue region depicts the region of the centriole which is covered by SPICE signal. (**H**) Diameter evolution of SPICE during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

CEP295

Localization
Proximal

Special features
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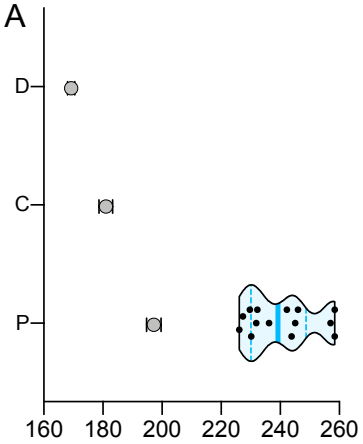
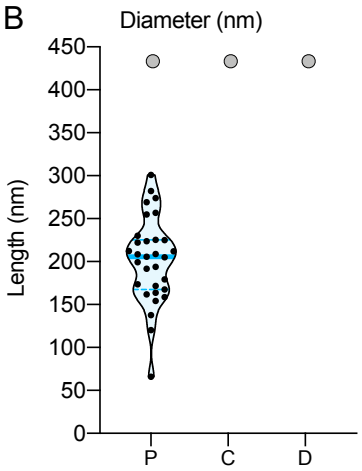
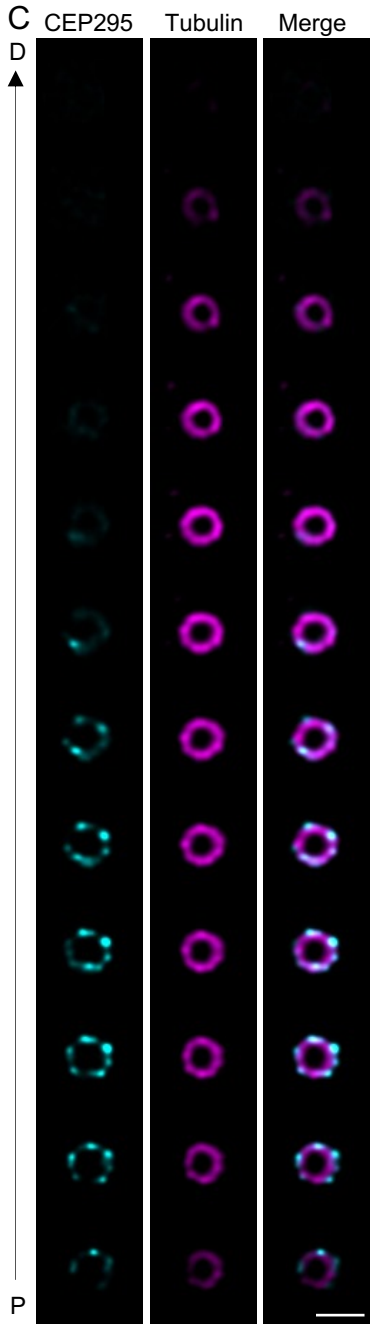
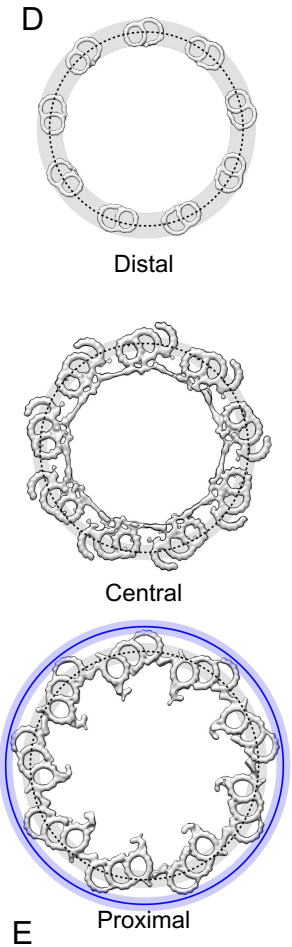
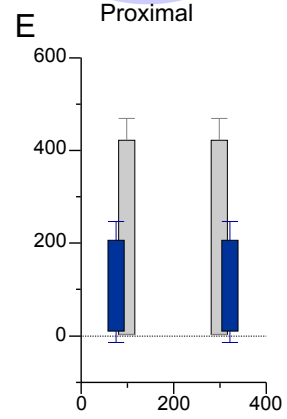
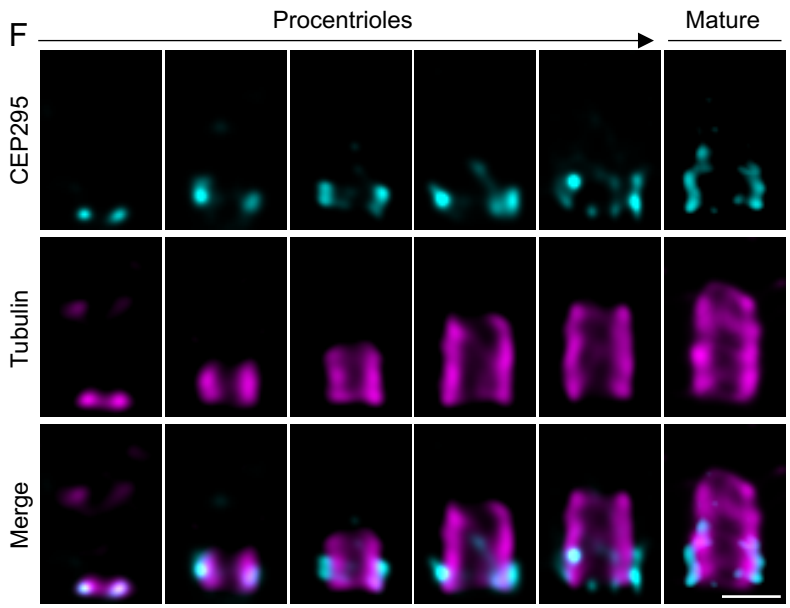


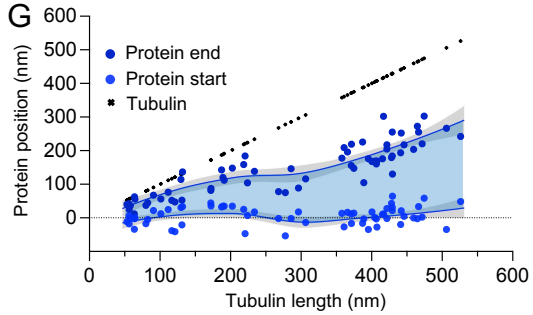


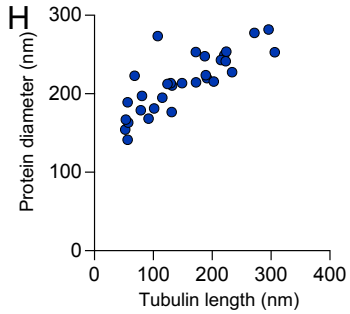


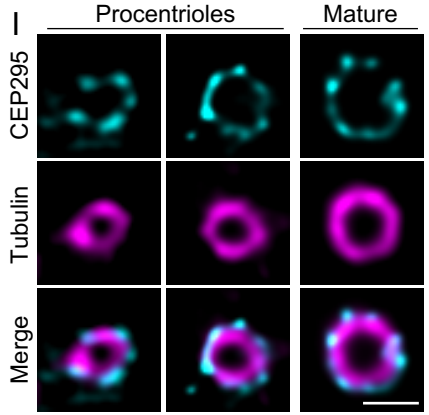










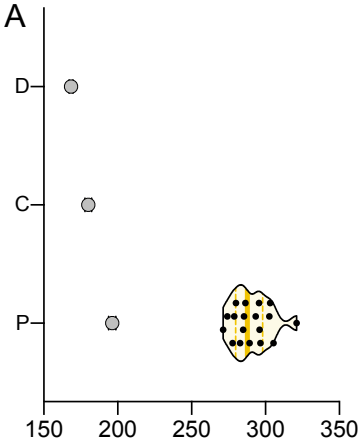


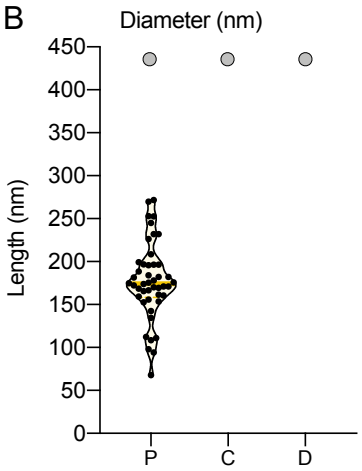
CEP295. (**A**) Measurement of CEP295 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP295= 240.4 +/- 11.6. n= 60, 55, 223 and 14 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP295 respectively. (**B**) Measurement of CEP295 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, Cep295=201.8 +/- 50.0 nm. n= 246 and 31 centrioles from 3 independent experiments for Tubulin and CEP295 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP295 (cyan). The merge channel shows that CEP295 is slightly external to the tubulin and is restricted to proximal region. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP295 (dark blue) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP295= 240 +/- 12 nm. n= 60, 55, 223 and 14 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP295 respectively. (**E**) Radial and longitudinal positions of CEP295 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 402 +/- 47 nm, CEP295 start= 8 +/- 26 nm, CEP295 end= 240 +/- 49 nm. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and CEP295 (cyan). The frieze shows that CEP295 appears together with tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the start and end position of CEP295 relative to tubulin growth during procentriole assembly. The growth of CEP295 was represented as loess curve (blue lines). The blue region depicts the region of the centriole which is covered by CEP295 signal. (**H**) Diameter evolution of CEP295 during centriole assembly (relative to tubulin length). (**J-I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

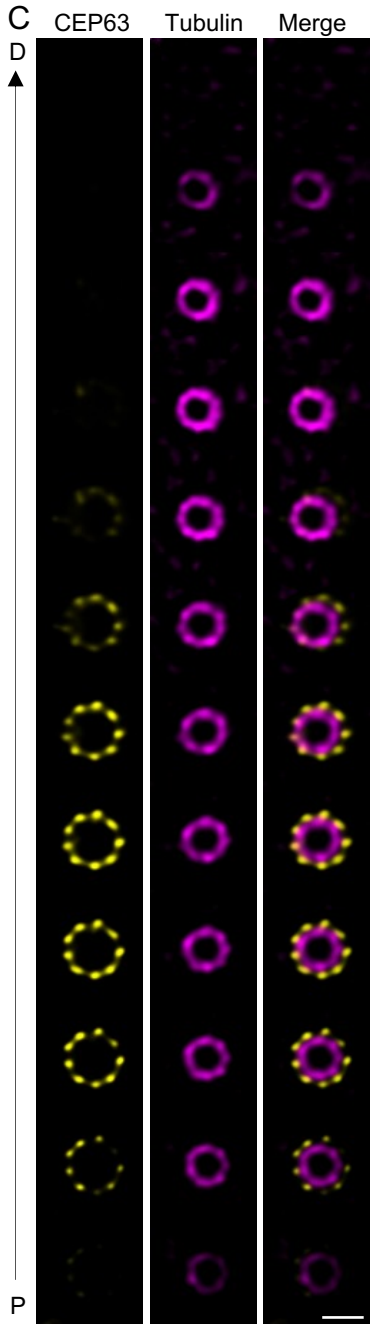
CEP63

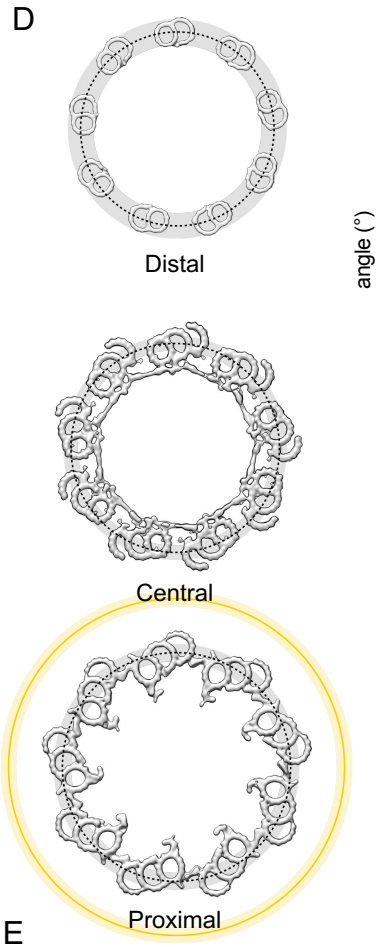
Localization
Proximal

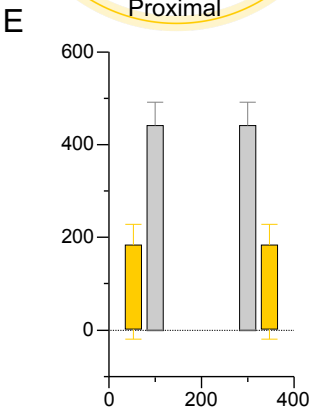
Special features
9-fold symmetry
Appears at mature centriole only

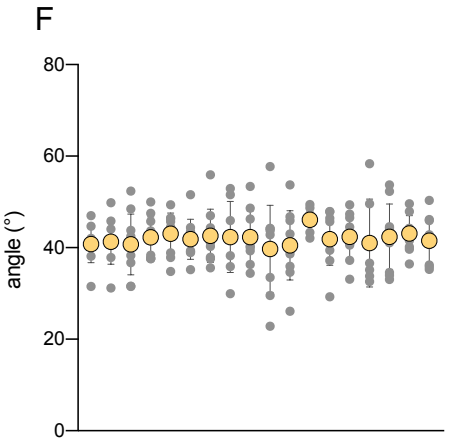


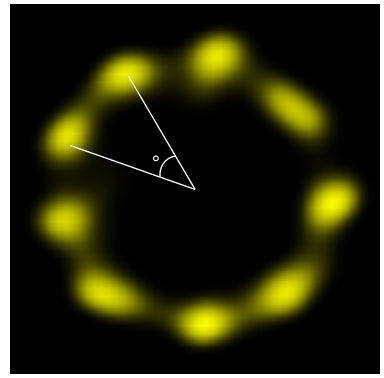


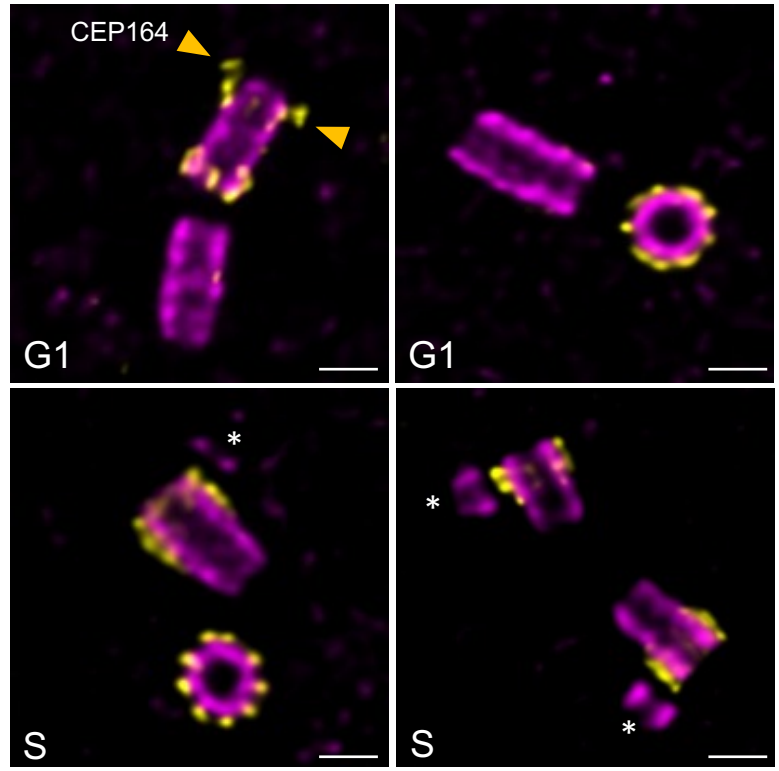










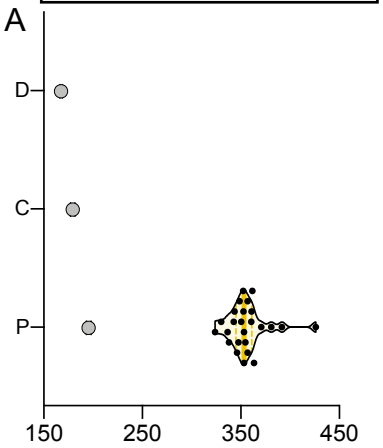


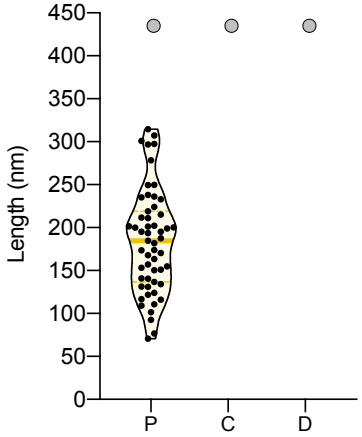
CEP63. (**A**) Measurement of CEP63 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP63= 290.3 +/- 12.7 nm. n= 60, 55, 223 and 18 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP63 respectively. (**B**) Measurement of CEP63 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CEP63= 176.9 +/- 44.6 nm. n= 246 and 46 centrioles from 3 independent experiments for tubulin and CEP63 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP63 (yellow). The merge channel shows that CEP63 is restricted to the proximal region where it organized as 9 dots around the centriole. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP63 (yellow line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP63=290 +/- 13 nm. n= 60, 55, 223 and 18 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP63 respectively. (**E**) Radial and longitudinal positions of CEP63 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 443 +/- 51 nm, CEP63 start= 4 +/- 21 nm, CEP63 end= 184 +/- 51 nm. (**F**) Angle measurement between each CEP63 dot from top view centrioles stained for Tubulin (not shown) and CEP63 (yellow). Scale bar : 200 nm. Average +/- SD: 40.8 +/- 4.1, 41.3 +/- 4.9, 40.7 +/- 6.6, 42.3 +/- 4.5, 43.1 +/- 4.5, 41.8 +/- 4.4, 42.6 +/- 5.8, 42.3 +/- 7.8, 42.3 +/- 5.7, 39.7 +/- 9.5, 40.5 +/- 7.6, 46.1 +/- 2.7, 41.9 +/- 5.7, 42.4 +/- 4.9 , 41.0 +/- 9.6, 42.4 +/- 7.1, 43.1 +/- 3.9, 41.5 +/- 4.9. n=18 centrioles from 3 independent experiments. (**G**) Images of centrosomes stained for tubulin (magenta) and CEP63 (yellow) showing that CEP63 is present only at the mother centriole (CEP164 positive, yellow arrowhead) during G1 phase and appears around the daughter centriole during S phase. White asterisks depict the procentrioles. Scale bars : 200 nm.

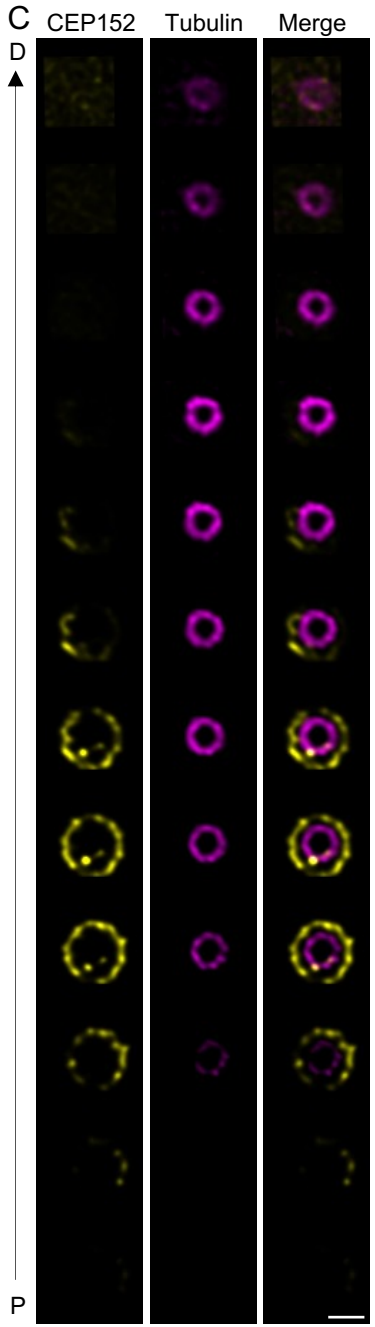
CEP152

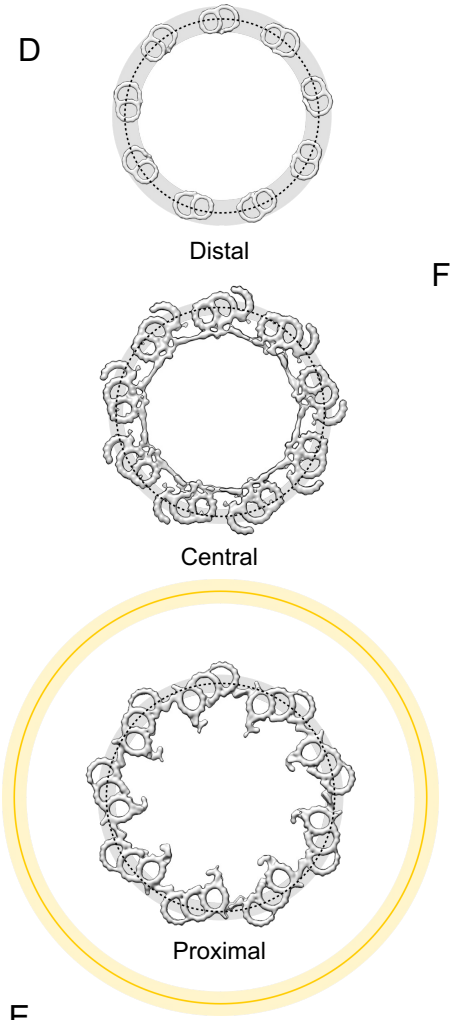
Localization
Proximal

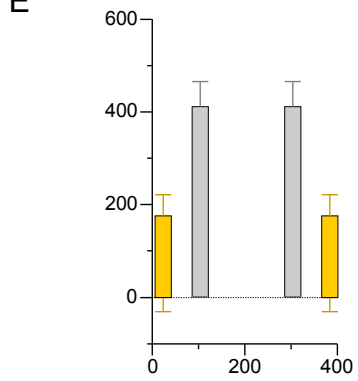
Special features
Appears at mature centriole only

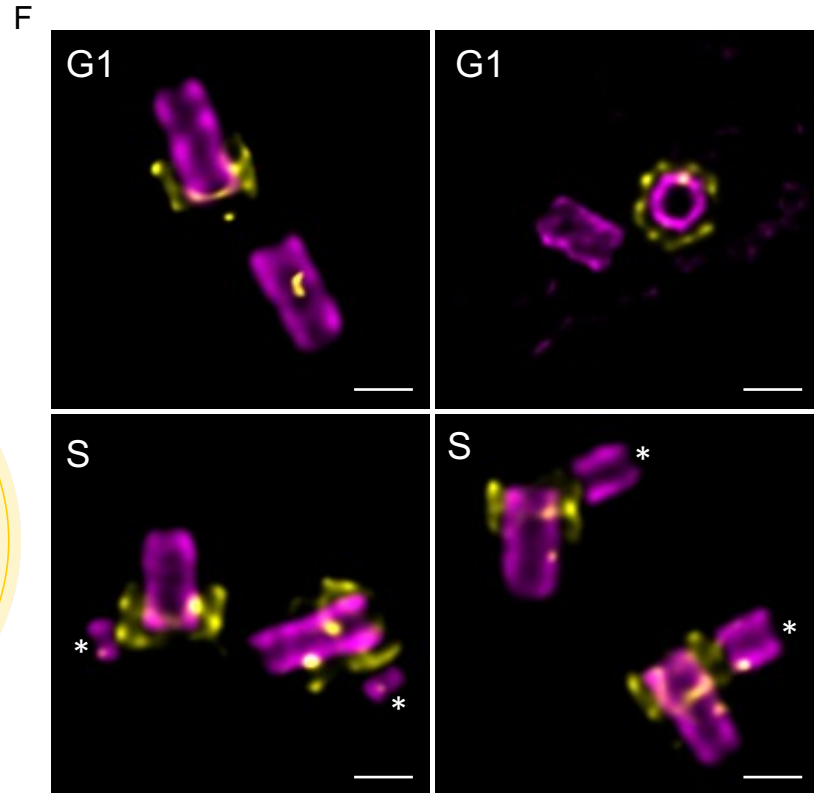










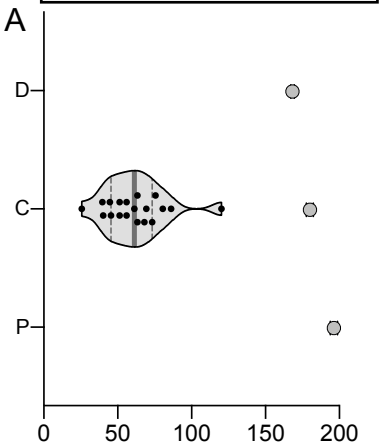


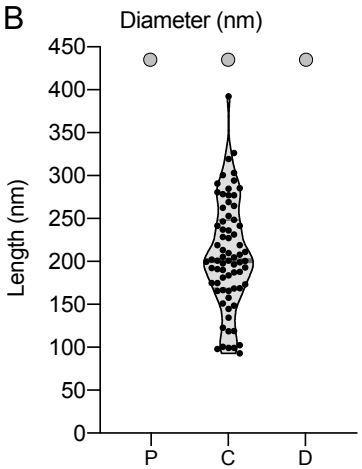
CEP152. (**A**) Measurement of CEP152 diameter in the indicated region of the mature centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP152= 356.2 +/- 20.6 nm. n= 60, 55, 223 and 25 centrioles respectively from 3 independent experiments. (**B**) Measurement of CEP152 length in the indicated region of mature centriole. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CEP152= 184.2 +/- 59.9 nm. n= 246 and 55 centrioles from 3 independent experiments for tubulin and CEP152 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP152 (yellow). The merge channel shows that CEP152 organizes as a ring around the proximal region of mature centrioles. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP152 (yellow line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP152=356 +/- 21 nm. n= 60, 55, 223 and 25 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP152 respectively. (**E** Radial and longitudinal positions of CEP152 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 410 +/- 54 nm, CEP152 start= -2 +/- 31 nm, CEP152 end= 157 +/- 54 nm. (**F**) Images of centrosomes stained for tubulin (magenta) and CEP152 (yellow) showing that CEP152 is present only at one of the two mature centrioles during G1 phase and appears around the other one during S phase. White asterisks depict the procentrioles. Scale bars : 200 nm.

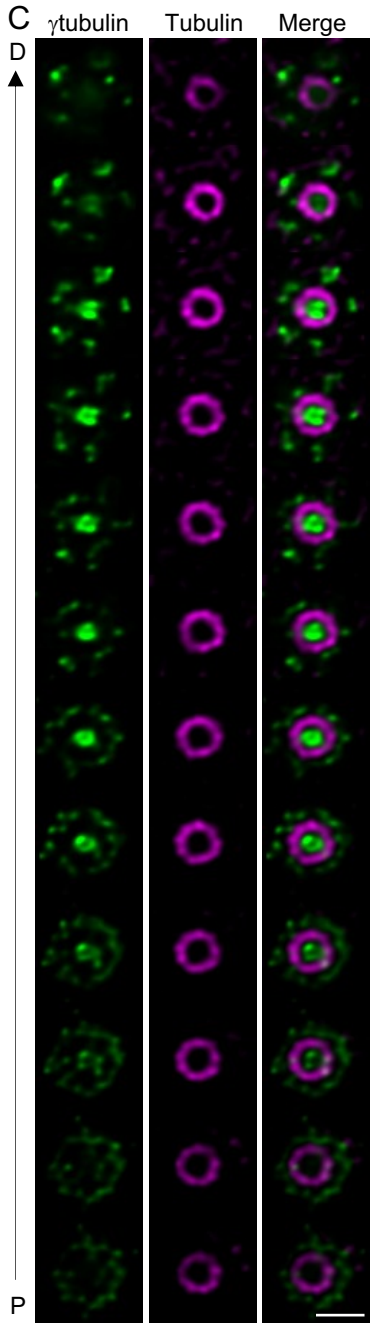
γTubulin

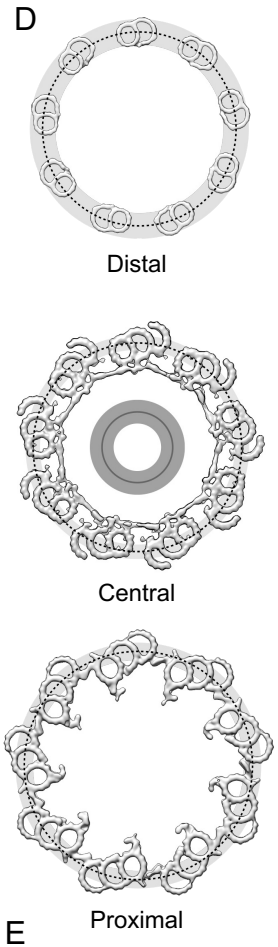
Localisation
Proximal + Central

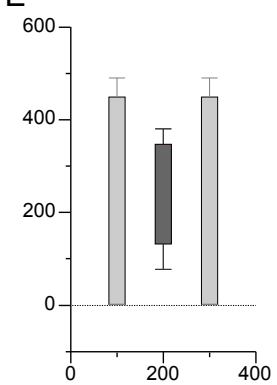
Special features
Below at procentriole
Disappears during assembly

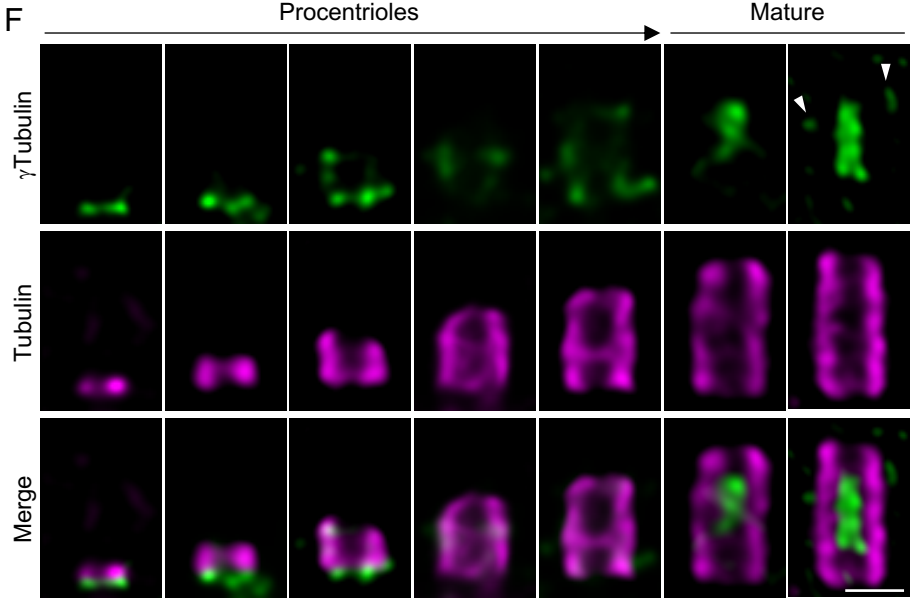


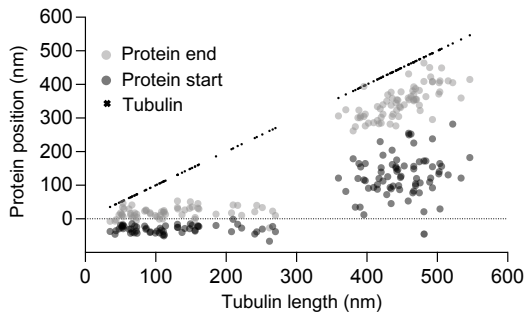


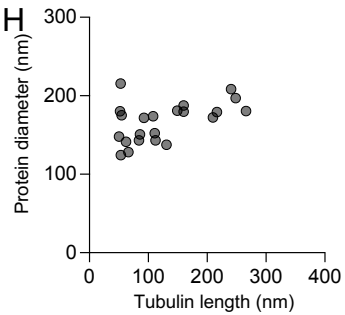


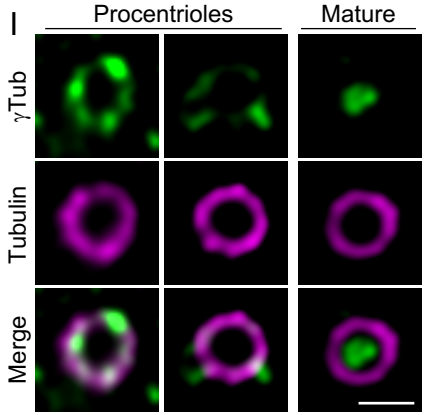










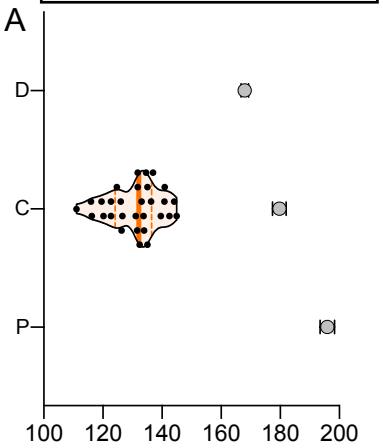


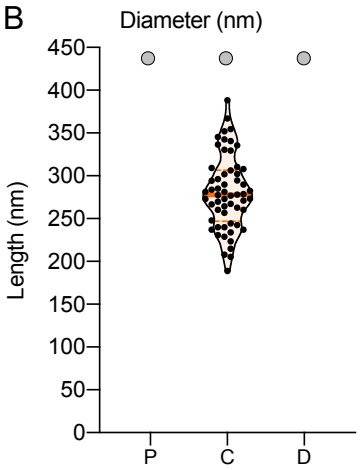
Gamma-tubulin. (**A**) Measurement of γtubulin inner diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, γtubulin n= 61.7 +/- 20.9 nm. n= 60, 55, 223 and 19 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and γtubulin respectively. (**B**) Measurement of γtubulin length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, γtubulin= 207.5 +/- 62.1 nm. n= 246 and 72 centrioles from 3 independent experiments for tubulin and γtubulin respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and γtubulin (green). The merge channel show that γtubulin is present both inside and outside of the centriole and is mainly located in the central region. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of γtubulin (grey line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, γtubulin= 50 +/- 9 nm. n= 60, 55, 223 and 28 from 3 independent experiments for tubulin P, tubulin C, tubulin D and γtubulin respectively. (**E**) Radial and longitudinal positions of γtubulin relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 448 +/- 41 nm, γtubulin start= 130 +/- 56 nm, γtubulin end= 346 +/- 48. (**F**) Images of centriole during assembly and at mature stage stained for tubulin (magenta) and γtubulin (green). The frieze shows that γtubulin appears together with tubulin and disappears during late procentriole assembly before the cell enters in mitosis. Note an additional localization of γtubulin outside the centriole present only at mature stage (arrowhead). Scale bar: 200 nm. (**G**) Evolution of the start and end position of γtubulin relative to tubulin growth during procentriole assembly. (**H**) Diameter evolution of γtubulin during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

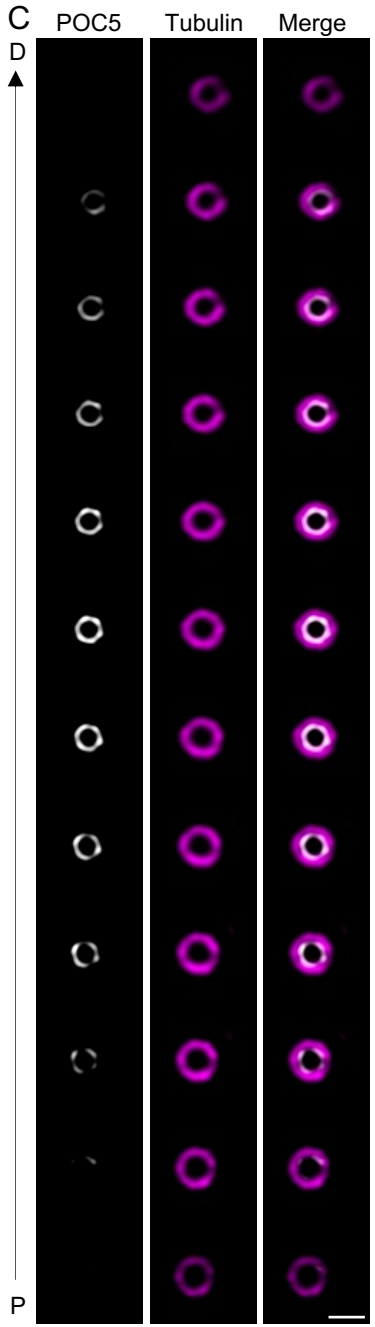
POC5

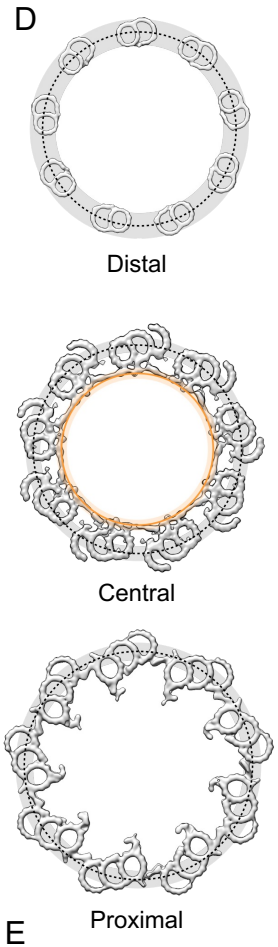
Localization
Central

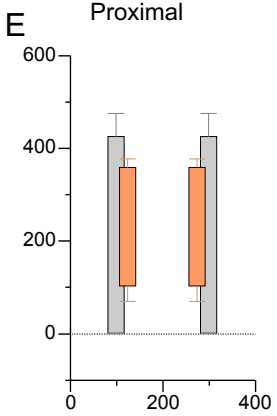
Special features
Appears during late procentriole assembly

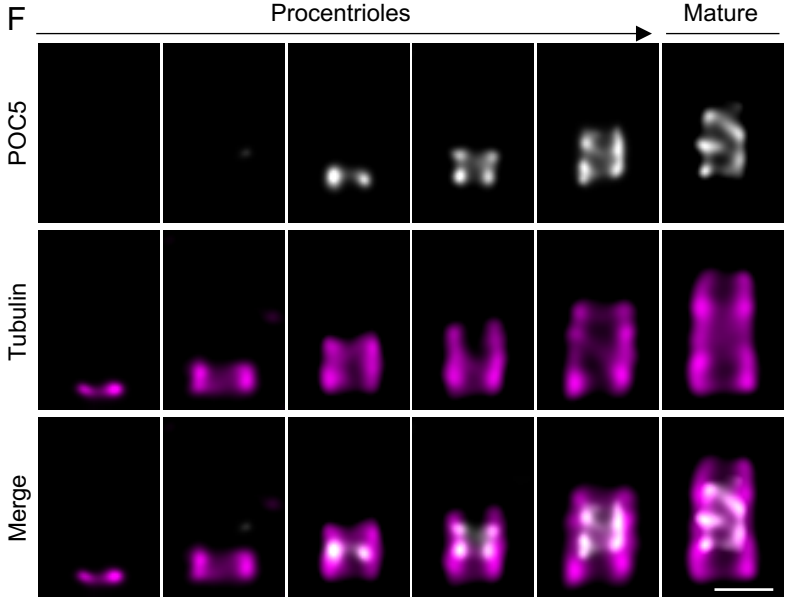


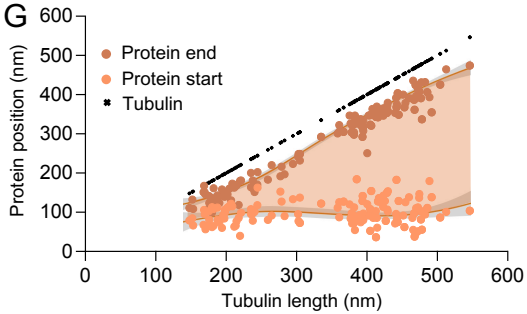


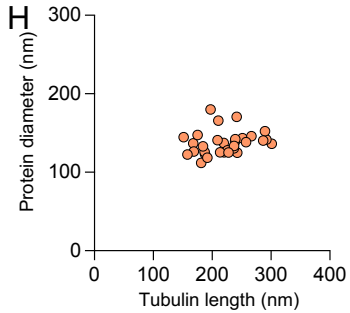


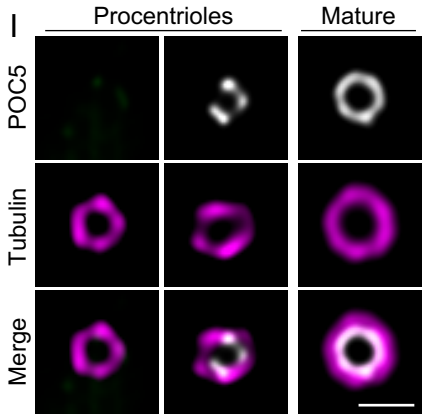










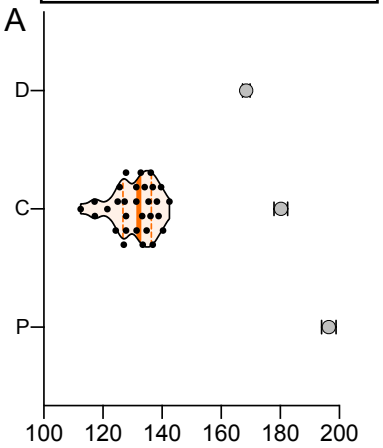


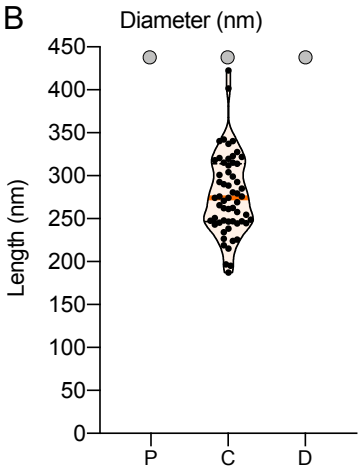
POC5. (**A**) Measurement of POC5 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, POC5= 130.8 +/- 8.8 nm. n= 60, 55, 223 and 30 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and POC5 respectively. (**B**) Measurement of POC5 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, POC5= 280.5 +/- 43 nm. N 246 and 58 centrioles from 3 independent experiments for tubulin and POC5 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and POC5 (grey). The merge channel shows that POC5 is lying on the internal part of the tubulin wall at the central region of the centriole. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of POC5 (orange line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, POC5= 131 +/- 9 nm. n= 60, 55, 223 and 30 from 3 independent experiments for tubulin P, tubulin C, tubulin D and POC5 respectively. (**E**) Radial and longitudinal positions of POC5 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 432 +/- 56 nm, POC5 start= 90 +/- 36 nm, 370 +/- 16 nm. (**F**) Images of centriole during assembly and at mature stage stained for tubulin (magenta) and POC5 (grey). The frieze shows that POC5 appears after tubulin during late procentriole assembly and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the start and end position of POC5 relative to tubulin growth during procentriole assembly. The growth of POC5 was represented as loess curve (orange lines). The peach region depicts the region of the centriole which is covered by POC5 signal. (**H**) Diameter evolution of POC5 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

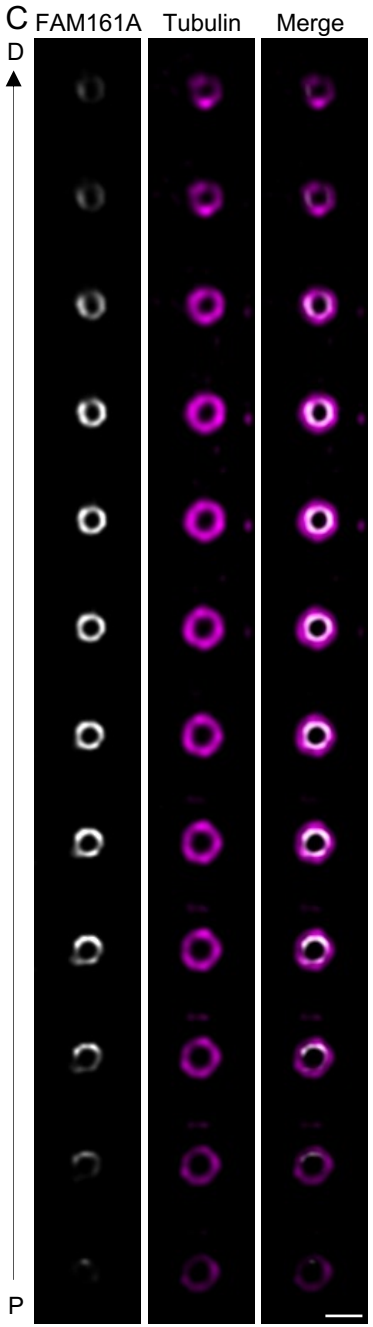
FAM161A

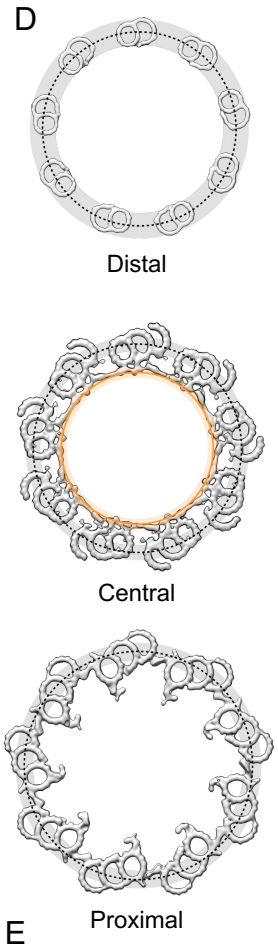
Localization
Central

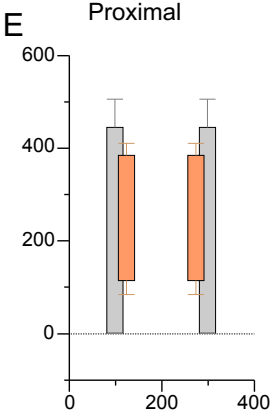
Special features
Appears during late procentriole assembly

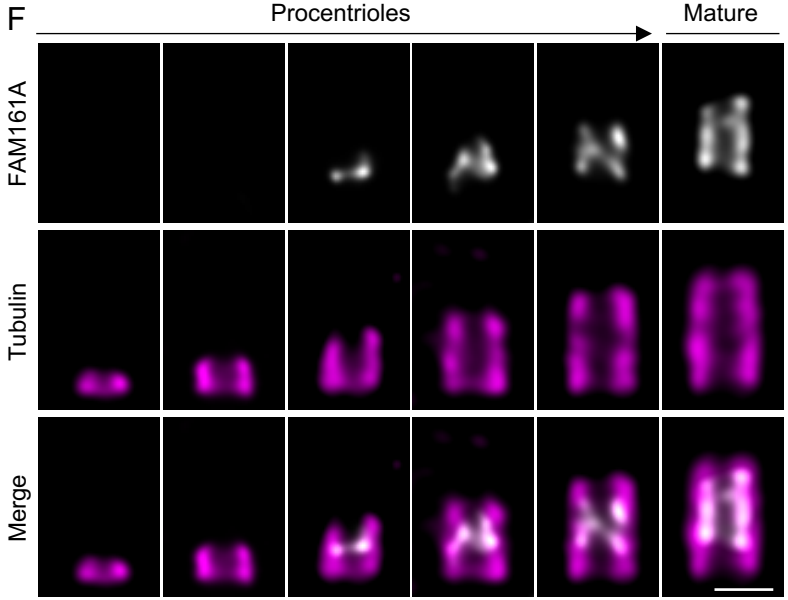


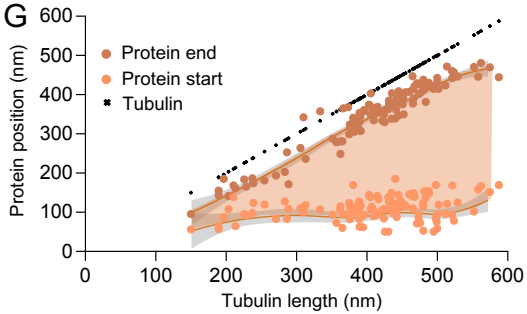


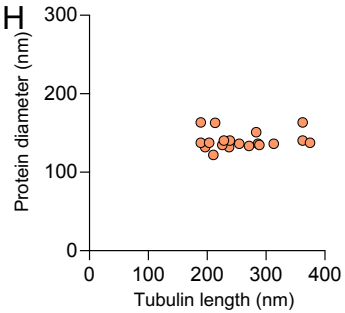


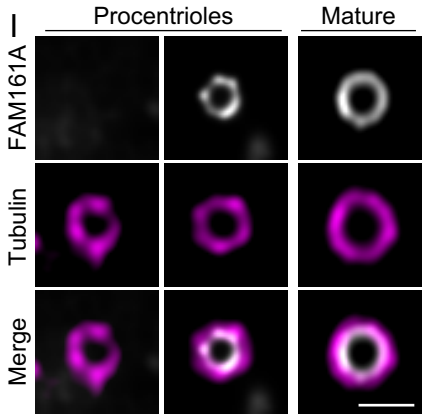










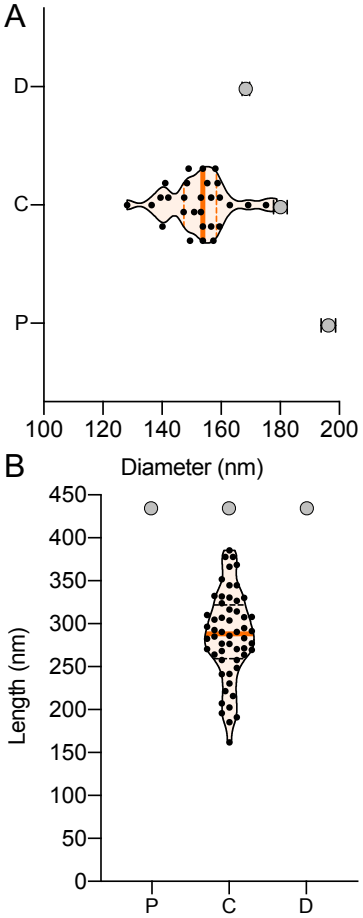


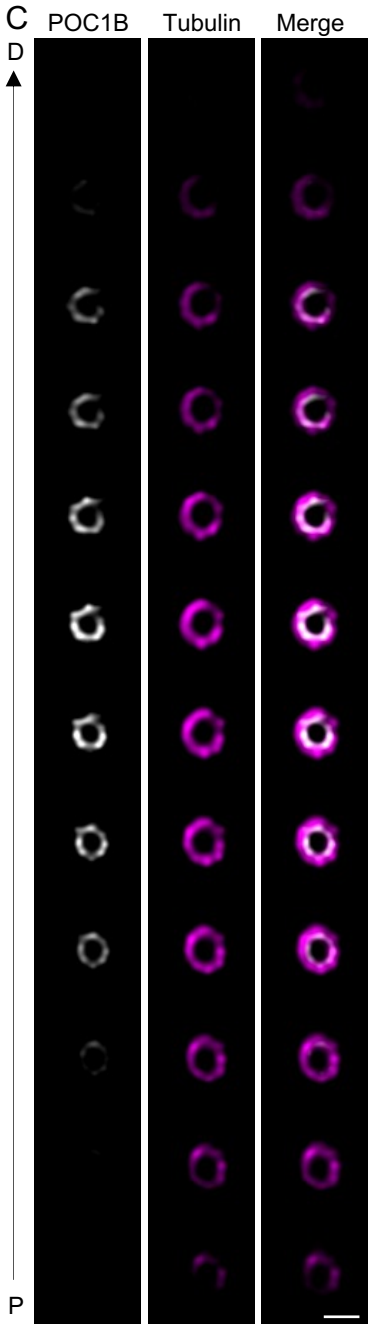
FAM161A. (**A**) Measurement of FAM161A diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, FAM161A= 130.8 +/- 7.4 nm. n= 60, 55, 223 and 30 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and FAM161A respectively. (**B**) Measurement of FAM161A length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, FAM161A= 277.3 +/- 46.3 n= 246 and 59 centrioles from 3 independent experiments for tubulin and FAM161A respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and FAM161A (grey). The merge channel shows that FAM161A is lying on the internal part of the tubulin wall at the central region of the centriole. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of FAM161A (orange line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, FAM161A= 131 +/- 7 nm. n= 60, 55, 223 and 30 from 3 independent experiments for tubulin P, tubulin C, tubulin D and FAM161A respectively. (**E**) Radial and longitudinal positions of FAM161A relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 432 +/- 56 nm, FAM161A start= 95 +/- 41 nm, 373 +/- 22 nm. (**F**) Images of centriole during assembly and at mature stage stained for Tubulin (magenta) and FAM161A (grey). The frieze shows that FAM161A appears after tubulin during late procentriole assembly and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the start and end positions of FAM161A relative to tubulin growth during procentriole assembly. The growth of FAM161A was represented as loess curve (orange lines). The peach region depicts the region of the centriole which is covered by FAM161A signal. (**H**) Measurement of the diameter evolution of FAM161A during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

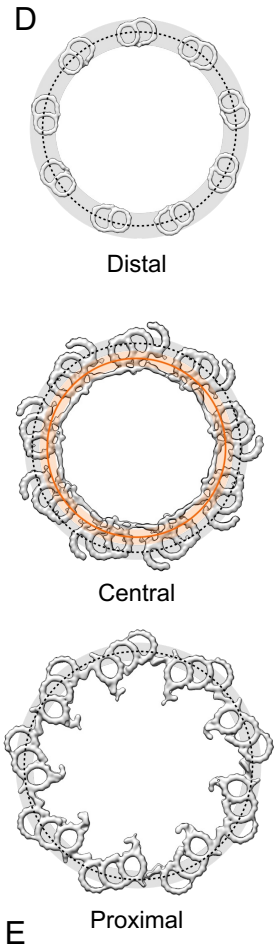
POC1B

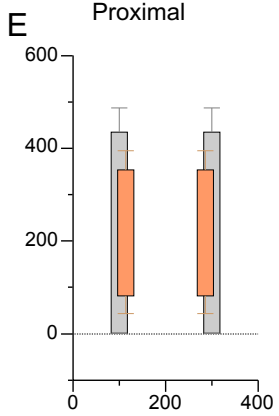
Localization
Central

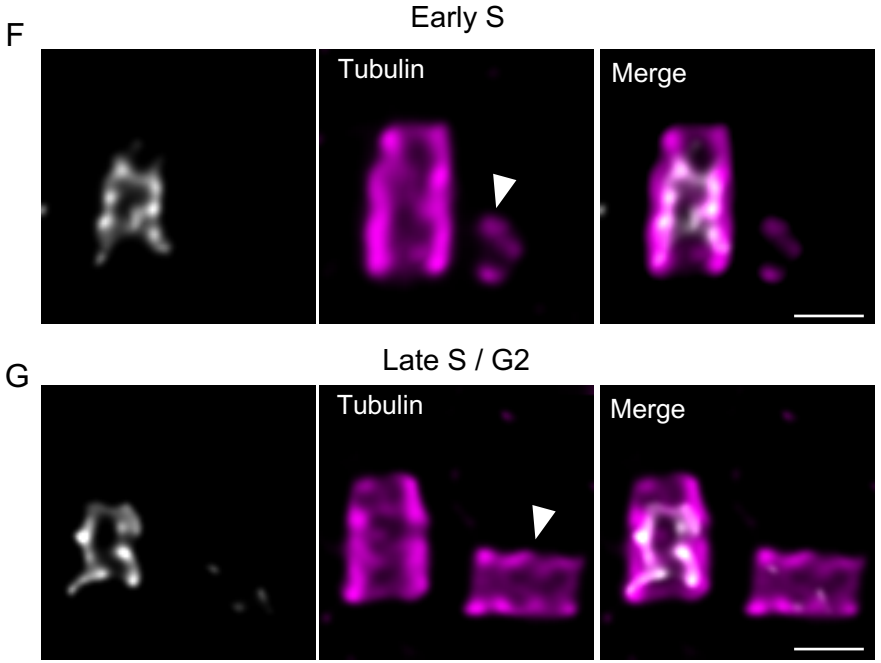
Special features
Appears only at mature centrioles

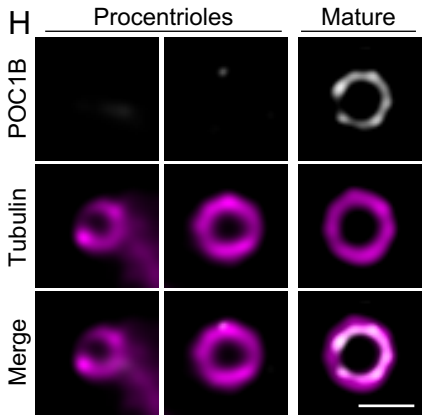










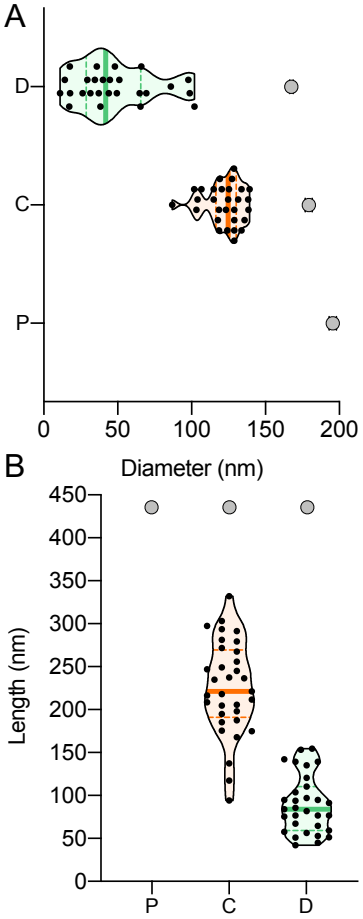


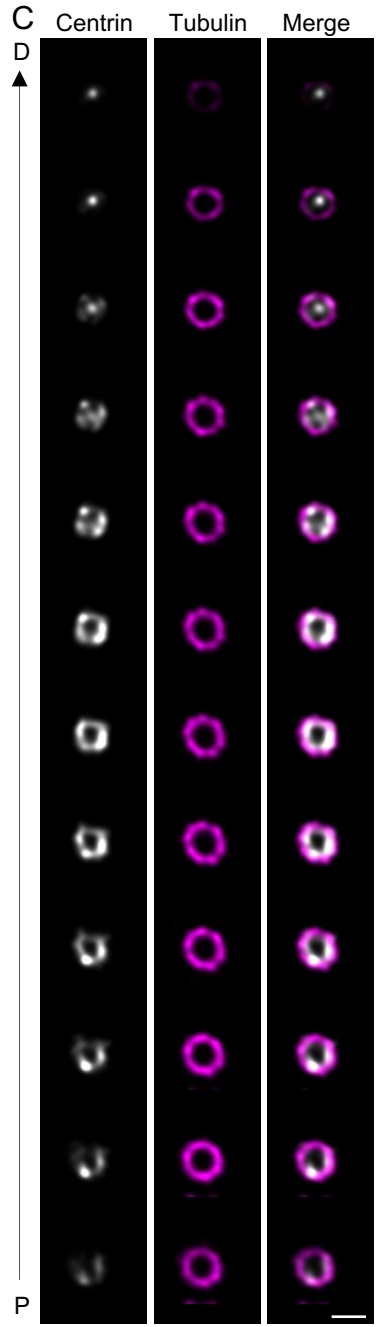
POC1B. (**A**) Measurement of POC1B diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, POC1B= 153 +/- 10.9 nm. n= 60, 55, 223 and 29 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and POC1B respectively. (**B**) Measurement of POC1B length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, POC1B= 286.1 +/- 51.3 nm. n= 246 and 56 centrioles from 3 independent experiments for tubulin and POC1B respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and POC1B (grey). The merge channel shows that POC1B is lying on the internal part of the tubulin wall at the central region of the centriole. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of POC1B (orange line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, POC1B= 153 +/- 12 nm. n= 60, 55, 223 and 29 from 3 independent experiments for tubulin P, tubulin C, tubulin D and POC1B respectively. (**E**) Radial and longitudinal positions of POC1B relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 432 +/- 56 nm, POC1B start= 67 +/- 37 nm, 356 +/- 40 nm. (**F, G**) Images of centriole at early procentriole assembly (Early S) and late procentriole assembly (Late S/G2) as well as mature stage stained for tubulin (magenta) and POC1B (grey). The images show that POC1B is absent from procentriole during assembly (arrowheads) and only appears at mature stages. Scale bar: 200 nm. (**H**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

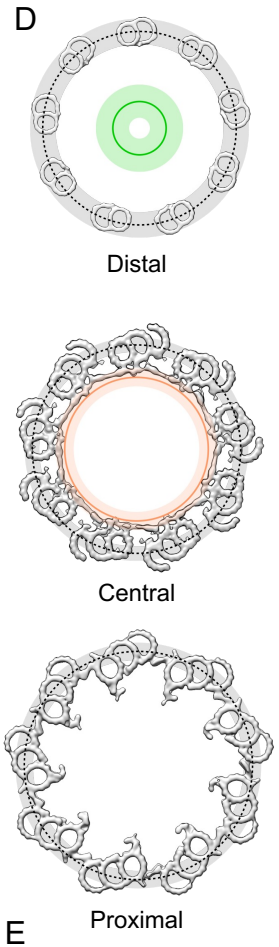
Centrin

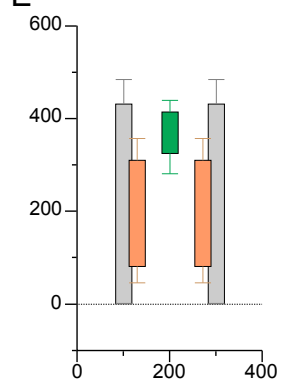
Localization
Central + Distal

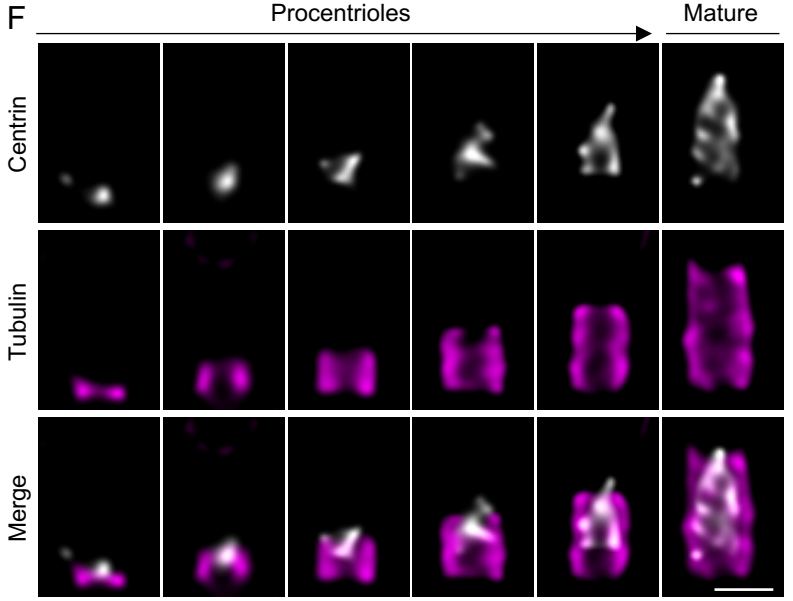
Special features
Appears with tubulin as distal dot

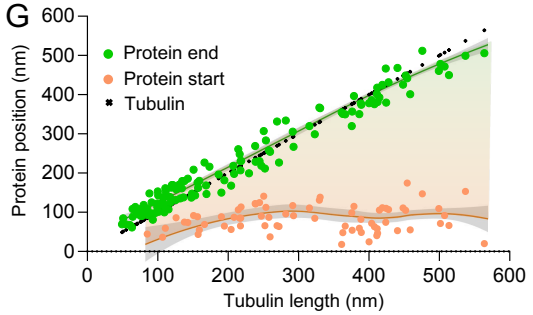


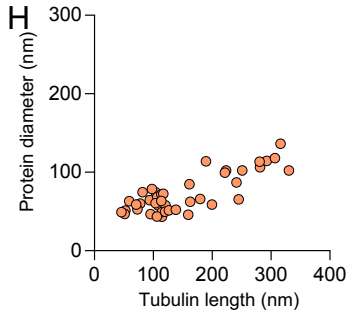


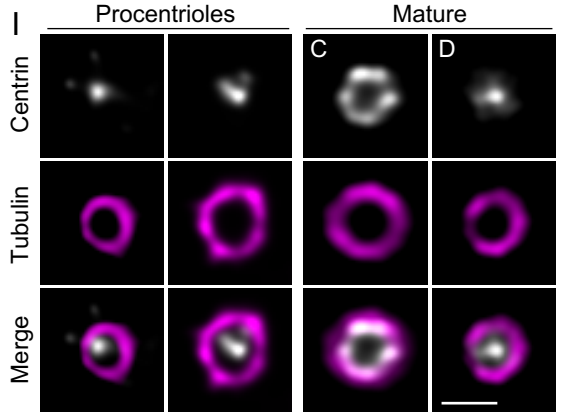












Centrin. (**A**) Measurements of centrin diameters in the proximal/central region (peach) and in the distal region (green) of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, centrin C= 122.3 +/- 12.5 nm, centrin D= 47.6 +/- 26.7 nm. n= 60, 55, 223, 29 and 26 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D, centrin C and centrin D respectively. (**B**) Measurements of centrin lengths in the proximal/central region (peach) and in the distal region (green) of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, centrin C= 225.5 +/- 54.6 nm, centrin D= 89.5 +/- 33.3 nm. n= 246, 33, 31 centrioles from 3 independent experiments for tubulin, centrin C and centrin D respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and centrin (grey). The merge channel shows that centrin is lying on the internal part of the tubulin wall at the central region of the centriole and as a luminal dot in the distal region. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of centrin at the central region (orange line) and at the distal region (green line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, centrin C= 122 +/- 16 nm, centrin D= 46 +/- 27 nm. n= 60, 55, 223, 29 and 27 from 3 independent experiments for tubulin P, tubulin C, tubulin D, centrin C and centrin D respectively. (**E**) Radial and longitudinal positions of centrin relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 431 +/- 54 nm, Centrin C start= 80 +/- 38 nm, centrin C end= 311 +/- 68 nm, Centrin D start= 325 +/- 64 nm, centrin D end= 413 +/- 5 nm. (**F**) Images of centriole during assembly and at mature stage stained for tubulin (magenta) and centrin (grey). The frieze shows that Centrin appears together with tubulin as a dot, spreads over the tubulin wall during procentriole assembly and persists until mature stage. Scale bar: 200 nm. (**G**) Evolution of the start (orange) and end (green) position of centrin relative to tubulin growth during procentriole assembly. The growth of Centrin was represented as loess curve (orange and green lines). The peach-to-green region depicts the region of the centriole which is covered by centrin signal. (**H**) Diameter evolution of central centrin during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

SFI1

Localization
Distal

Special features
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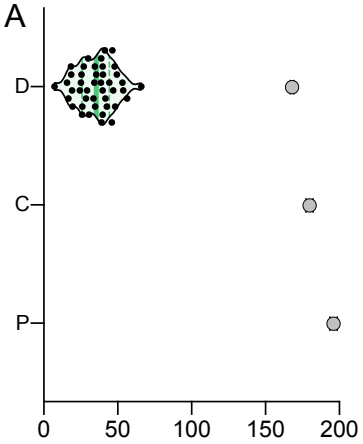
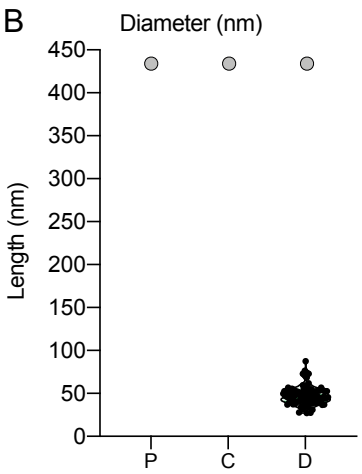
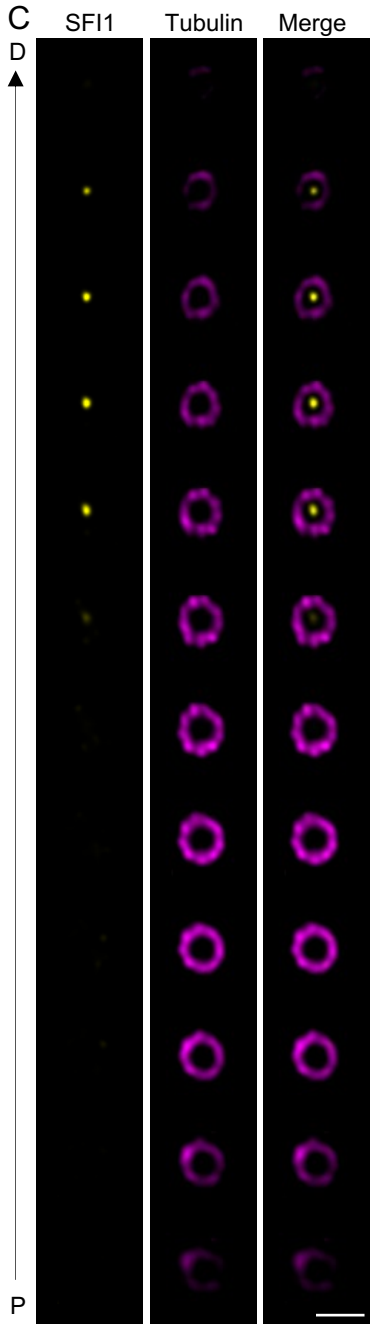
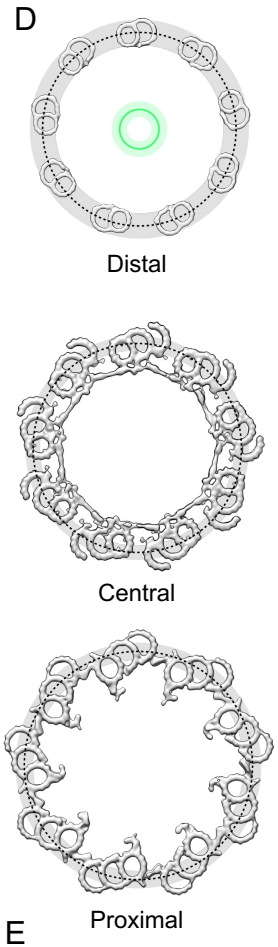
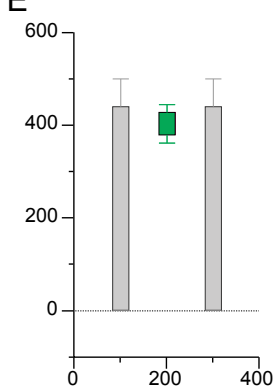
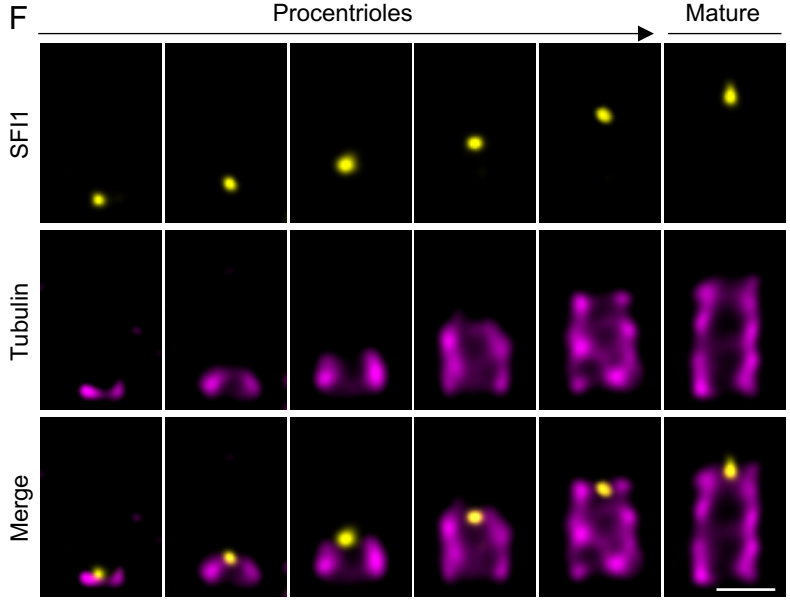


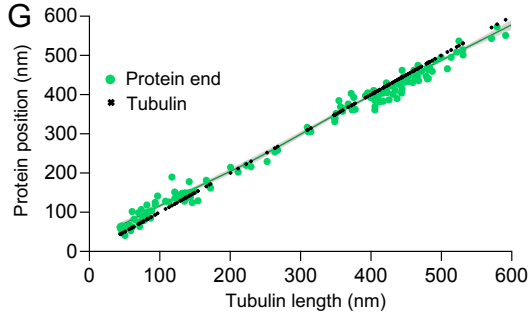


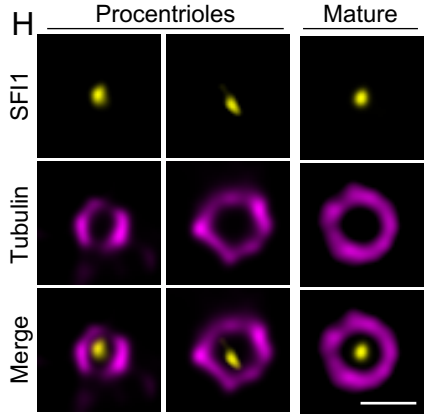










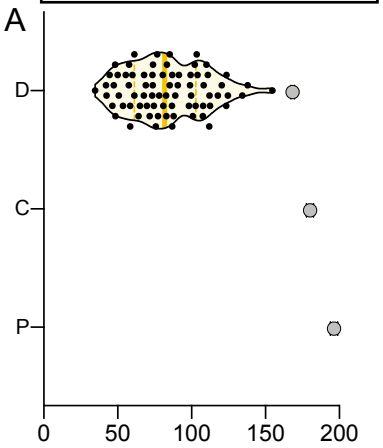


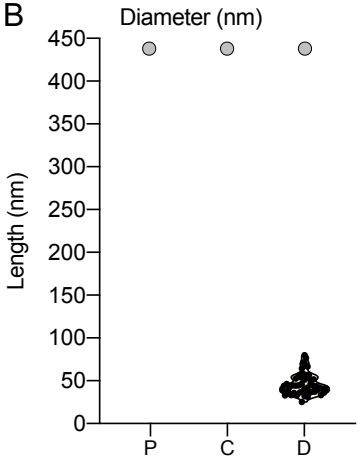
SFI1. (**A**) Measurement of SFI1 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, SFI1= 35.4 +/- 12.5 nm. n= 60, 55, 223 and 43 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and SFI1 respectively. (**B**) Measurement of SFI1 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, SFI1=47.8 +/- 11.2 nm. n= 246 and 86 centrioles from 3 independent experiments for tubulin and SFI1 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and SFI1 (yellow). The merge channel reveals that SFI1 is restricted to the distal region where it forms a luminal dot. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of SFI1 (green line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, SFI1= 35 +/- 13. n= 60, 55, 223 and 44 from 3 independent experiments for tubulin P, tubulin C, tubulin D and SFI1 respectively. (**E**) Radial and longitudinal positions of SFI1 relative to the normalized tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, tubulin end= 440 +/- 60 nm, SFI1 start=379 +/- 55, SFI1 end= 427 +/- 55 nm. (**F**) Images of centriole during assembly and at mature stage stained for tubulin (magenta) and SFI1 (yellow). The frieze shows that SFI1 appears together with tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the position of SFI1 relative to tubulin growth during procentriole assembly. The growth of SFI1 was represented as loess curve (green lines). (**H**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

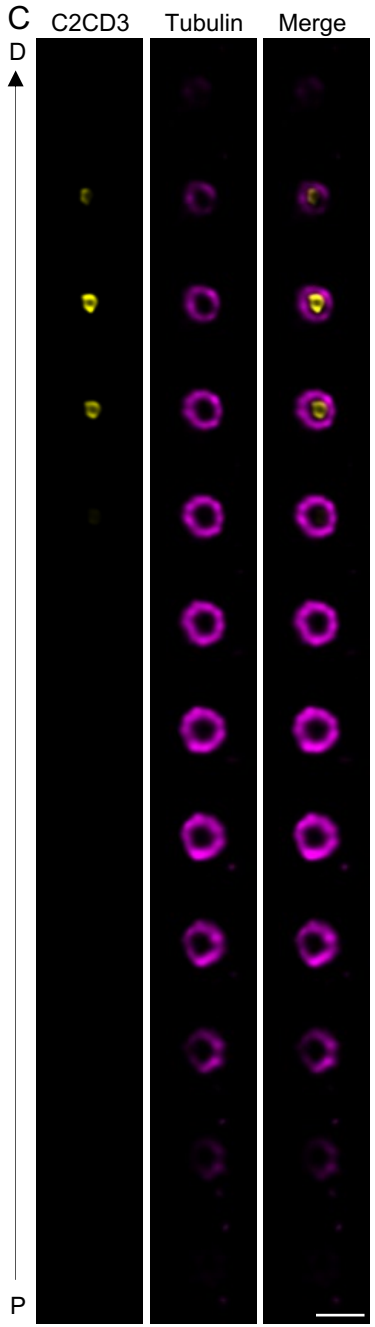
C2CD3

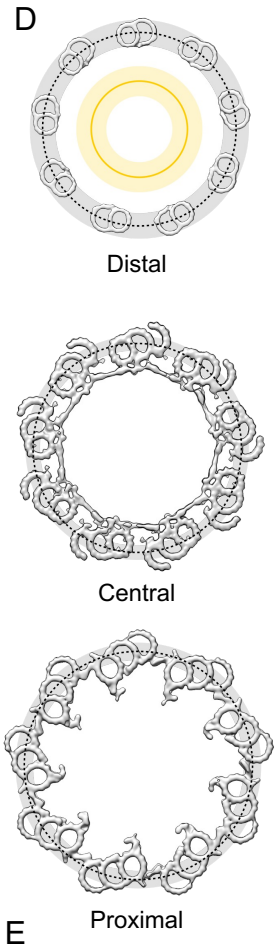
Localization
Distal

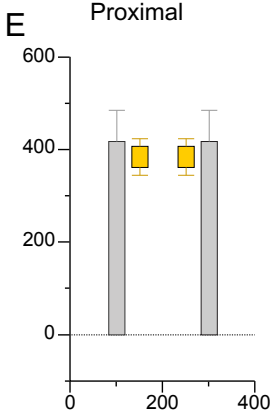
Special features
Luminal ring

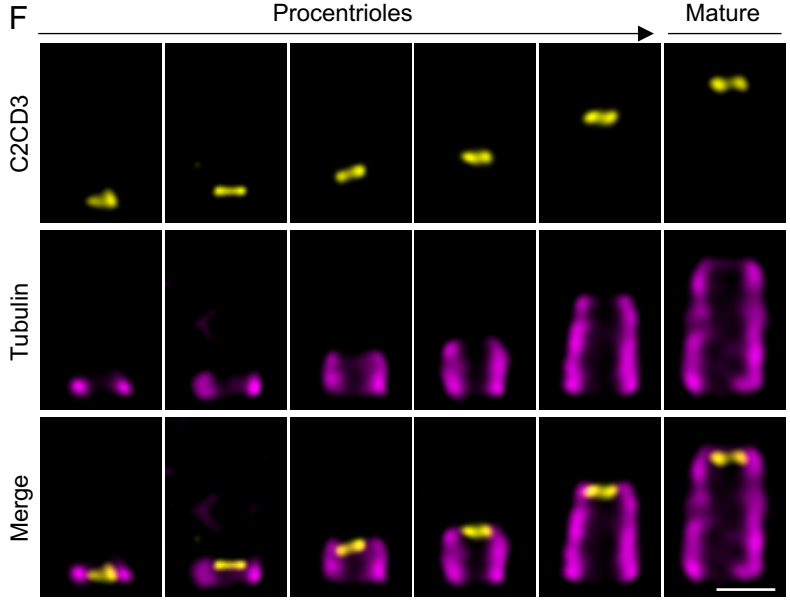


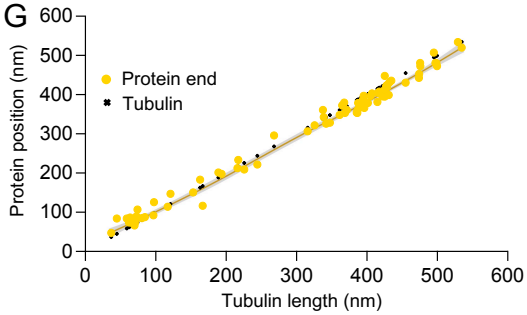


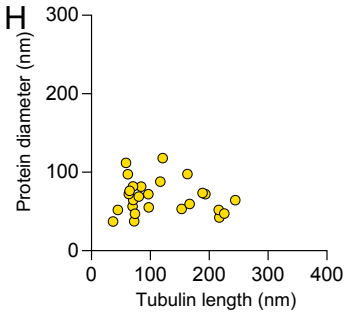


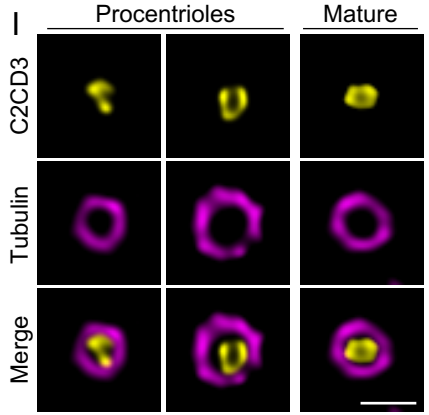












C2CD3. (**A**) Measurement of C2CD3 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, C2CD3= 83.2 +/- 26.1 nm. n= 60, 55, 223 and 74 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and C2CD3 respectively. (**B**) Measurement of C2CD3 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, C2CD3= 46 +/- 12.3 nm. N246 and 51 centrioles from 3 independent experiments for tubulin and C2CD3 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and C2CD3 (yellow). The merge channel shows that C2CD3 forms a ring in the lumen of the distal region of the centriole. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of C2CD3 (yellow line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, C2CD3= 83 +/- 26 nm. n= 60, 55, 223 and 74 from 3 independent experiments for tubulin P, tubulin C, tubulin D and C2CD3 respectively. (**E**) Radial and longitudinal positions of C2CD3 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 418 +/- 68 nm, C2CD3 start= 362 +/- 62 nm, C2CD3 end= 407 +/- 63 nm. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and C2CD3 (yellow). The frieze shows that C2CD3 appears together with tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the position of C2CD3 relative to tubulin growth during procentriole assembly. The growth of C2CD3 was represented as loess curve (yellow line). (**H**) Diameter evolution of C2CD3 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

CEP162

Localization
Distal

Special features
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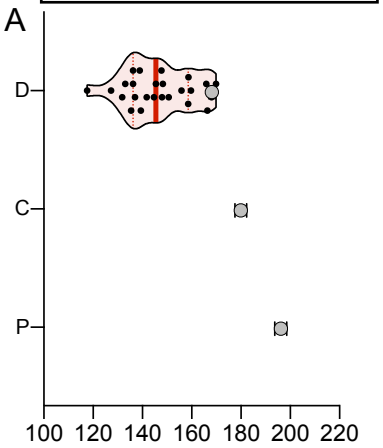

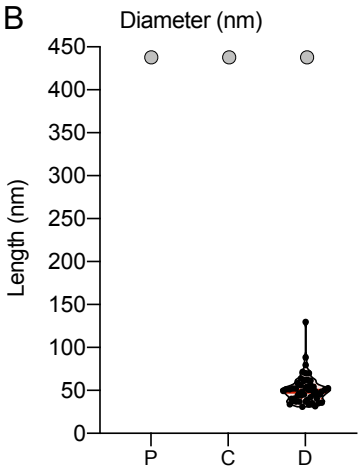

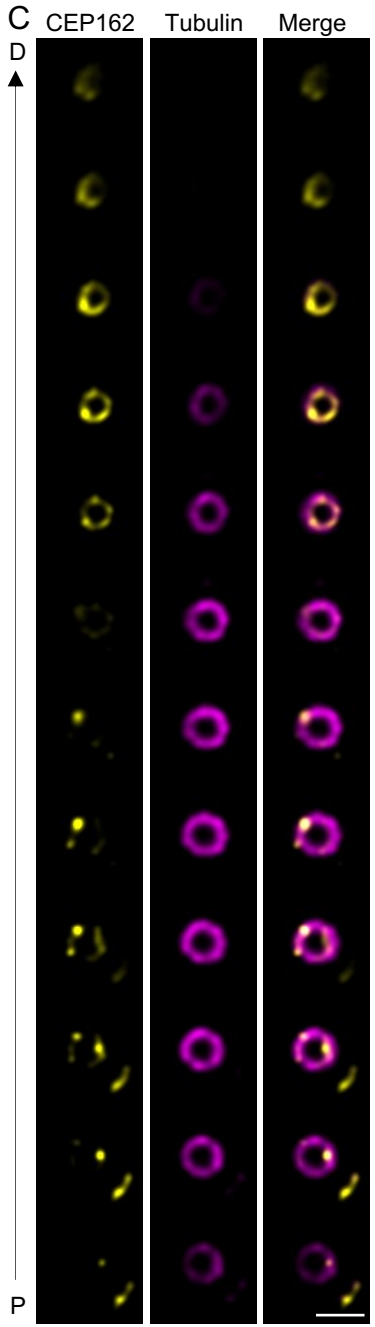

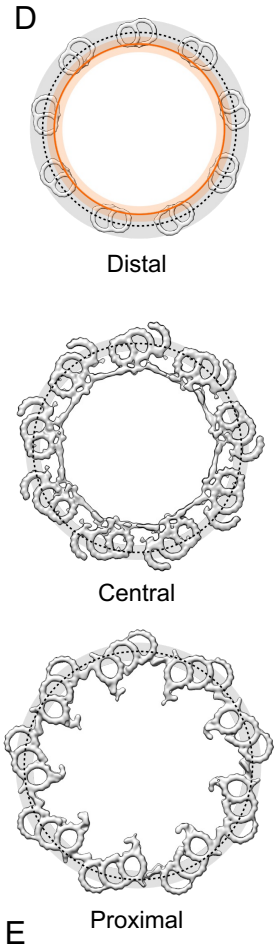

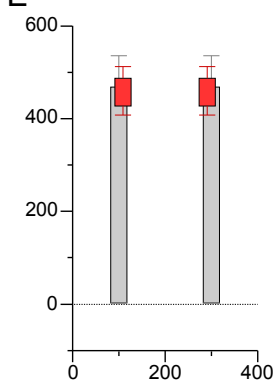

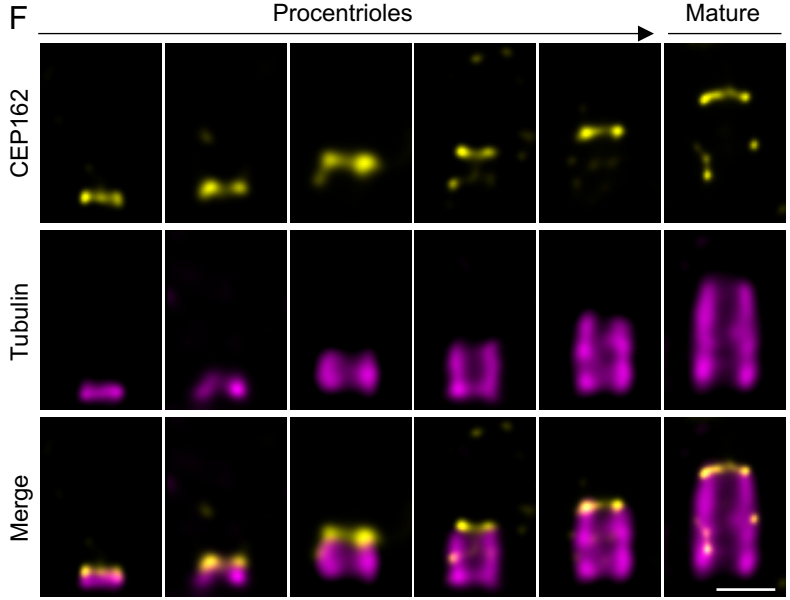

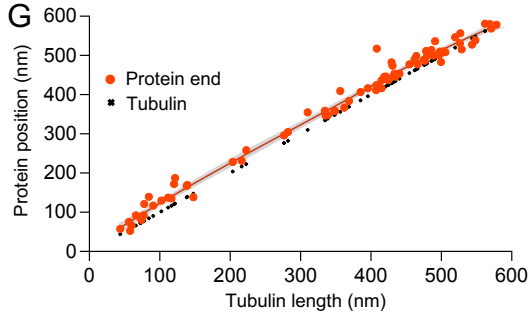

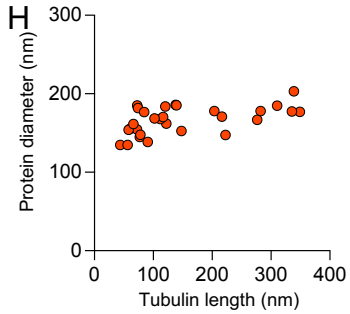

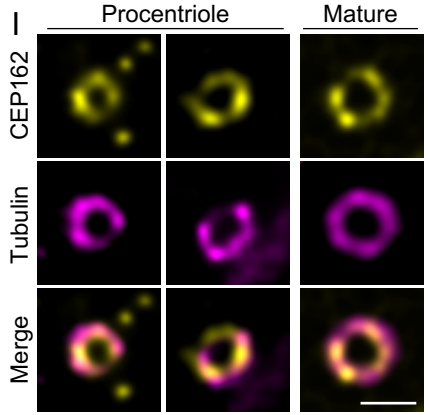

CEP162. (**A**) Measurement of CEP162 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP162= 146.5 +/- 13.8 nm. n= 60, 55, 223 and 25 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP162 respectively. (**B**) Measurement of CEP162 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CEP162= 51.2 +/- 16.6 nm. n= 246 and 52 centrioles from 3 independent experiments for tubulin and CEP162 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP162 (yellow). The merge channel show that CEP162 is restricted to the distal region where it caps the microtubule wall. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP162 (orange line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP162=147 +/- 14 nm. n= 60, 55, 223 and 25 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP162 respectively. (**E**) Radial and longitudinal positions of CEP162 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 460 +/- 60 nm, CEP162 start= 424 +/- 56 nm, CEP162 end= 477 +/- 57 nm. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and CEP162 (yellow). The frieze shows that CEP162 appears together with tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the position of CEP162 relative to tubulin growth during procentriole assembly. The growth of CEP162 was represented as loess curve (red line). (**H**) Diameter evolution of CEP162 during centriole assembly (relative to tubulin length). (**I**) Images of expanded procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

CEP97

Localization
Distal

Special features
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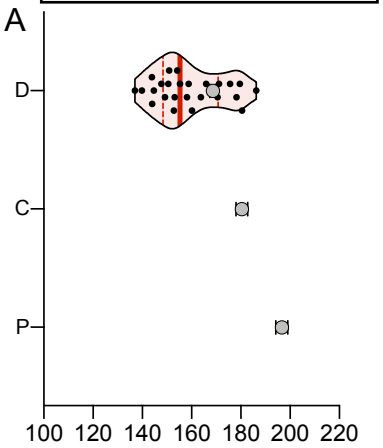
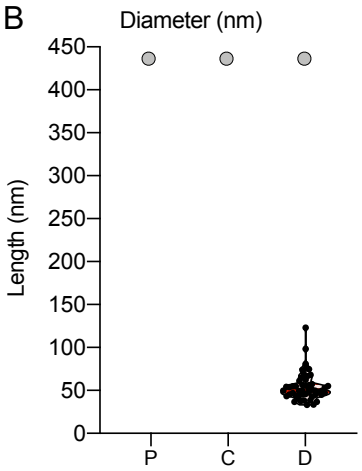
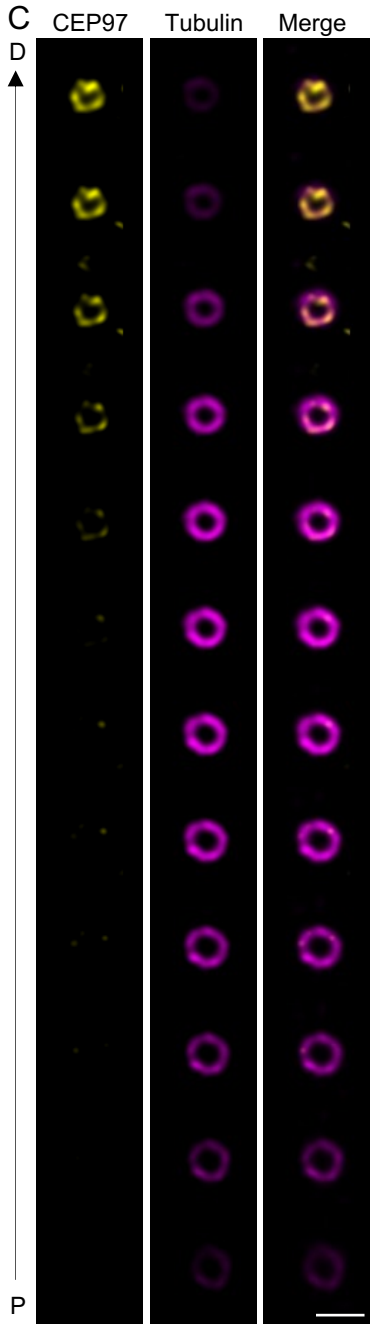
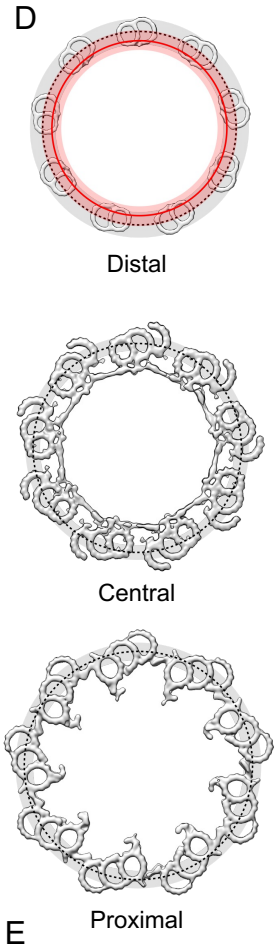
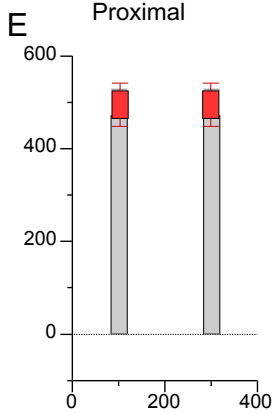
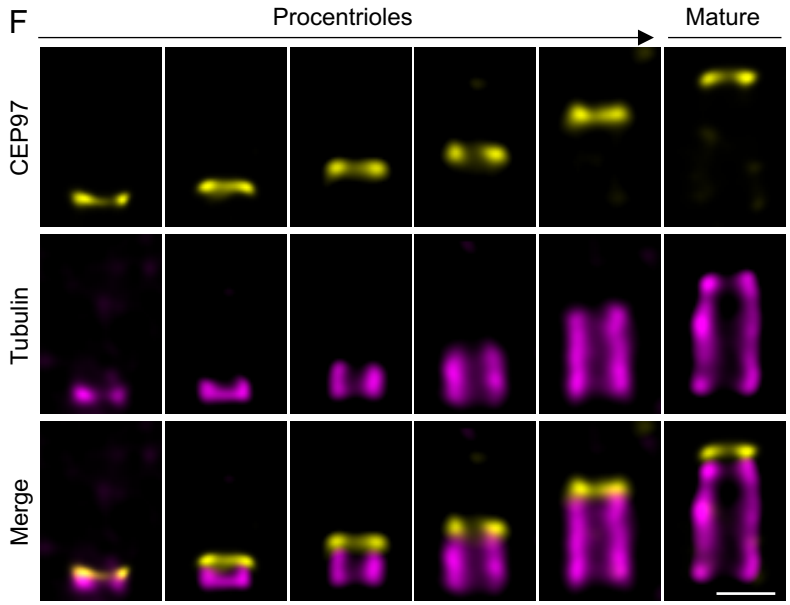


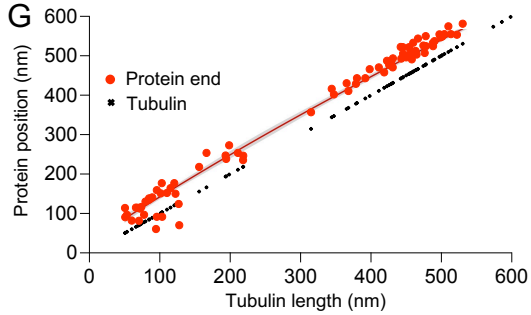


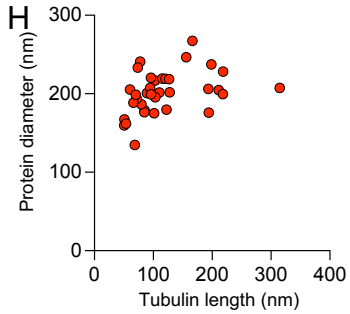


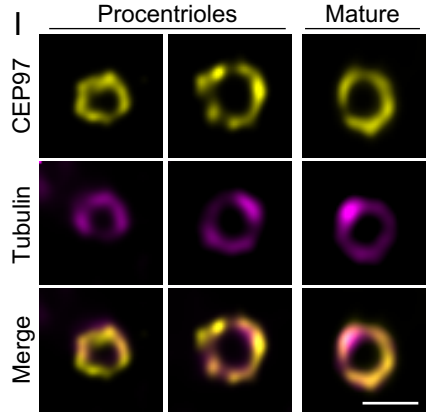










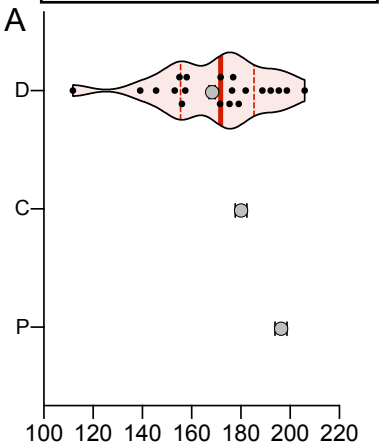


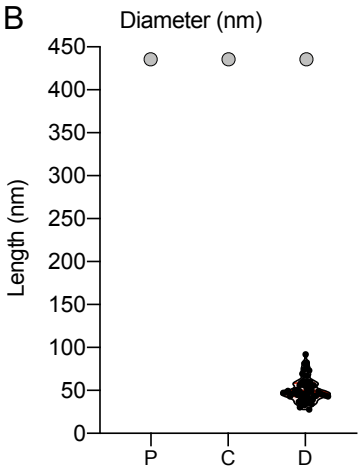
CEP97. (**A**) Measurement of CEP97 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP97= 158.9 +/- 13.9 nm. n= 60, 55, 223 and 25 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP97 respectively. (**B**) Measurement of CEP97 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CEP97= 54 +/- 16.2 nm. n= 246 and 51 centrioles from 3 independent experiments for tubulin and CEP97 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP97 (yellow). The merge channel shows that CEP97 is restricted to the distal region where it caps the microtubule wall. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP97 (red line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP97=161+/- 18 nm. n= 60, 55, 223 and 26 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP97 respectively. (**E**) Radial and longitudinal positions of CEP97 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 462 +/- 61 nm, CEP97 start= 457 +/- 55 nm, CEP97 end= 514 +/- 57 nm. (**F**) Images of centrioles during assembly and at mature stage stained for Tubulin (magenta) and CEP97 (yellow). The frieze shows that CEP97 appears together with tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the position of CEP97 relative to tubulin growth during procentriole assembly. The growth of CEP97 was represented as loess curve (red line). (**H**) Diameter evolution of CEP97 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

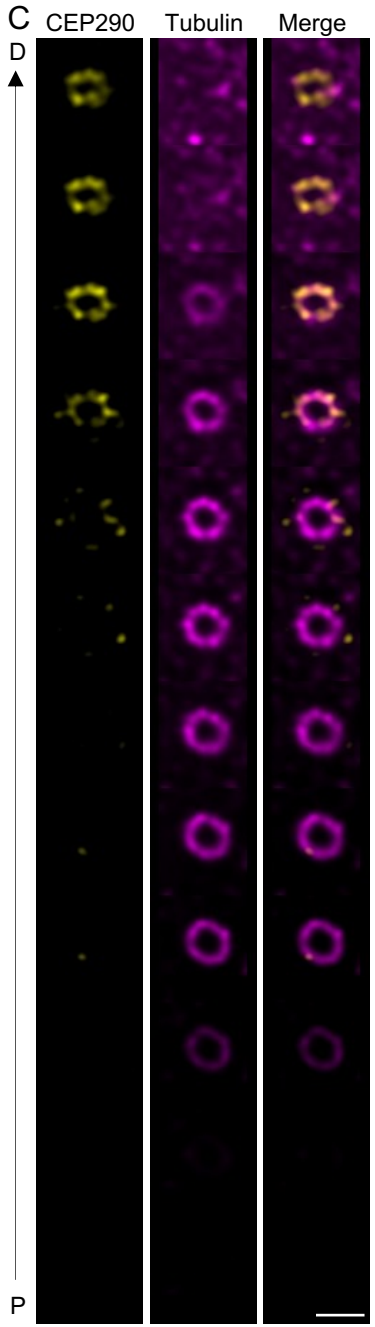
CEP290

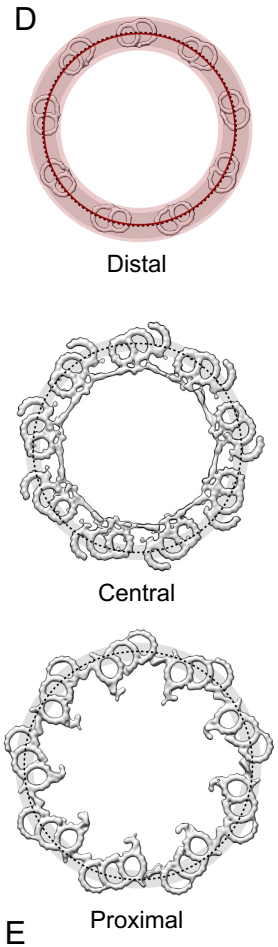
Localization
Distal

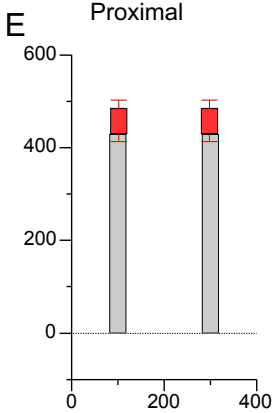
Special features
Additional localization at mature centrioles

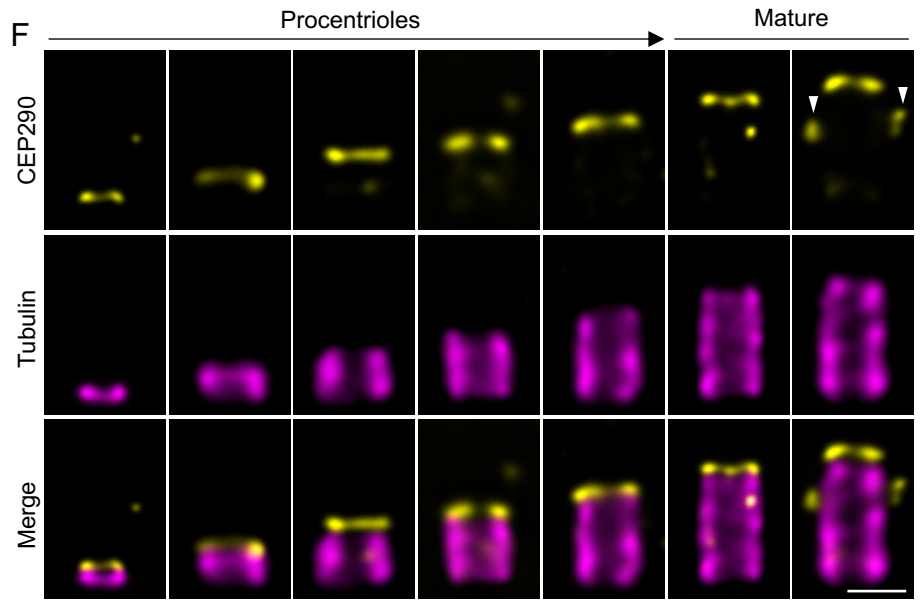


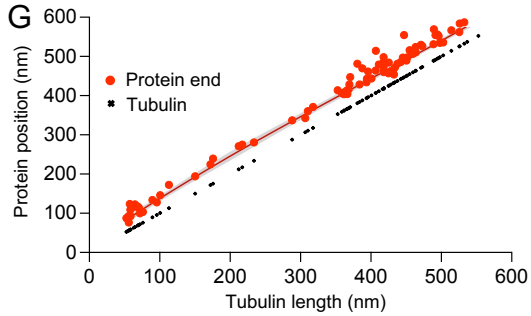


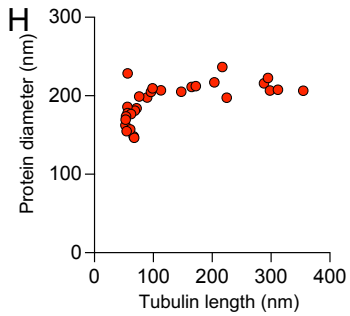


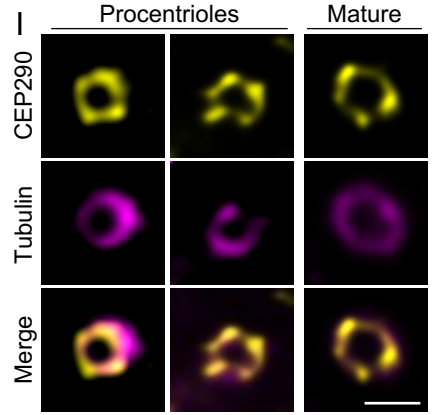










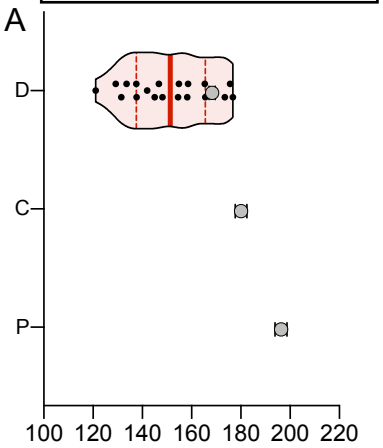


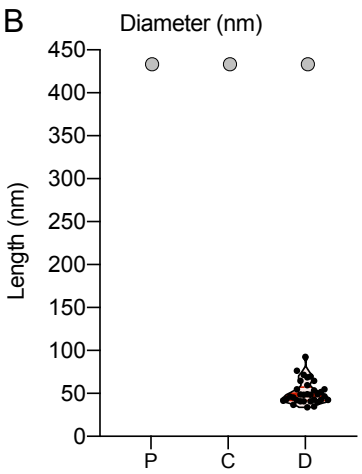
CEP290. (**A**) Measurement of CEP290 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP290= 169.6 +/- 22.2 nm. n= 60, 55, 223 and 21 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP290 respectively. (**B**) Measurement of CEP290 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CEP290= 51.1 +/- 13.9 nm. n= 246 and 55 centrioles from 3 independent experiments for tubulin and CEP290 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP290 (yellow). The merge channel show that CEP290 is restricted to the distal region where it caps the microtubule wall. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP290 (red line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP290=165+/- 30 nm. n= 60, 55, 223 and 22 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP290 respectively. (**E**) Radial and longitudinal positions of CEP290 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 437 +/- 52 nm, CEP290 start= 441 +/- 55 nm, CEP290 end= 493+/- 54 nm. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and CEP290 (yellow). The frieze shows that CEP290 appears together with tubulin and persists during procentriole assembly until mature stage. Note an additional distal localization of CEP290 present only at mature stage (arrowhead). Scale bar: 200 nm. (**G**) Evolution of the position of CEP290 relative to tubulin growth during procentriole assembly. The growth of CEP290 was represented as loess curve (red line). (**H**) Diameter evolution of CEP290 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

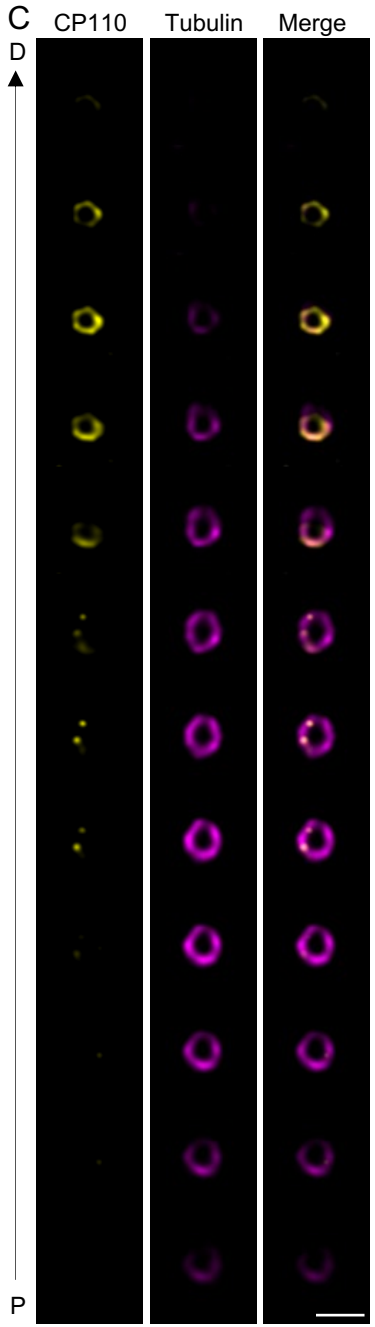
CP110

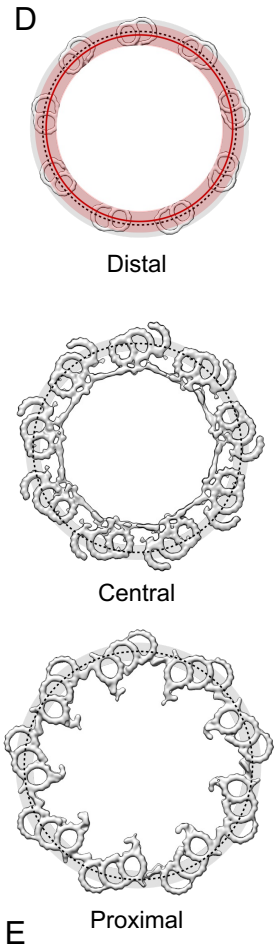
Localization
Distal

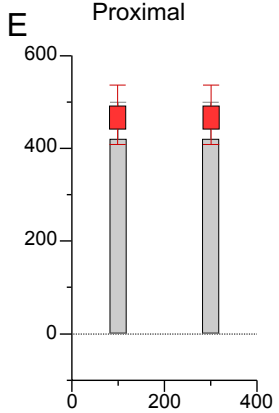
Special features
/

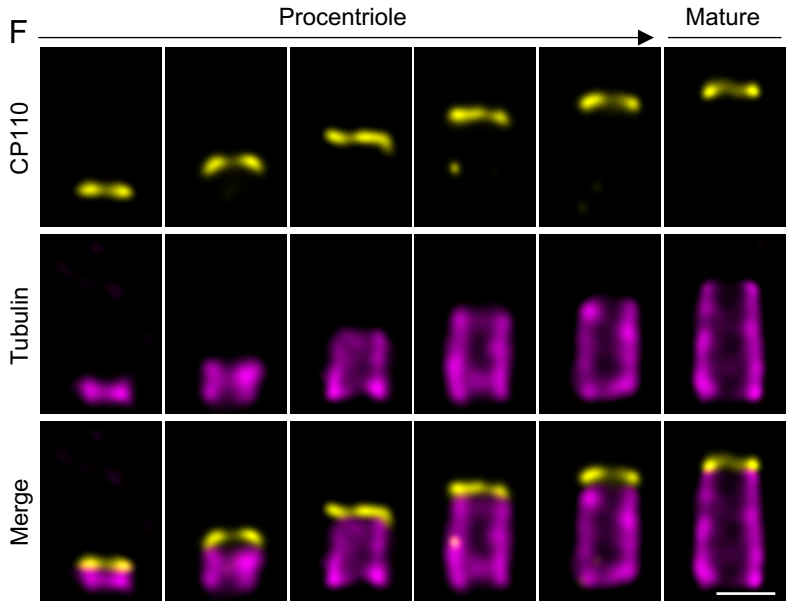


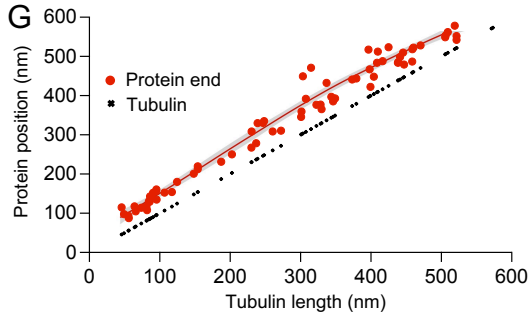


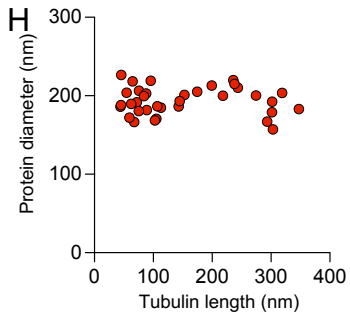


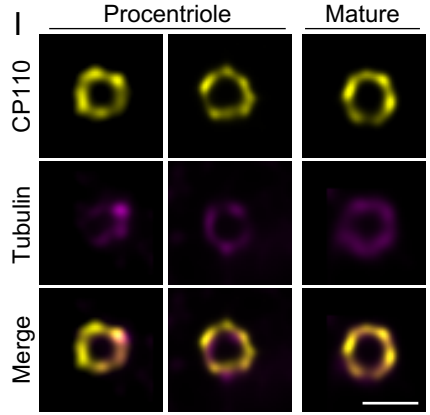










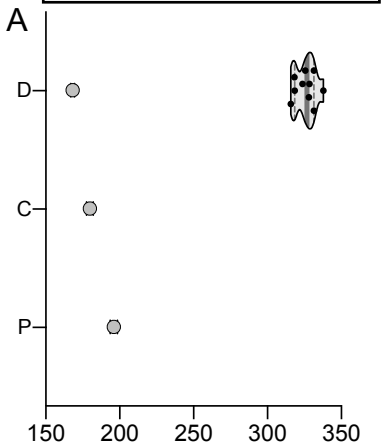


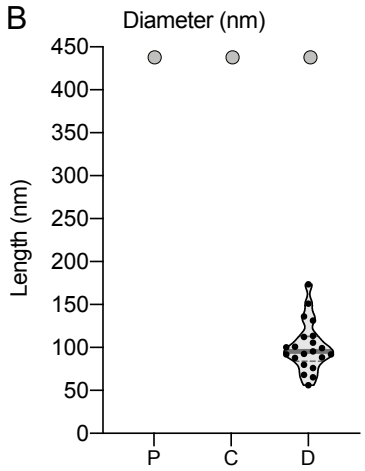
CP110. (**A**) Measurement of CP110 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CP110= 151.3 +/- 16.6 nm. n= 60, 55, 223 and 20 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CP110 respectively. (**B**) Measurement of CP110 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CP110= 51.1 +/- 13.3 nm. n= 246 and 33 centrioles from 3 independent experiments for tubulin and CP110 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CP110 (yellow). The merge channel shows that CP110 is restricted to the distal region where it caps the microtubule wall. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CP110 (red line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CP110=151 +/- 17 nm. n= 60, 55, 223 and 20 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CP110 respectively. (**E**) Radial and longitudinal positions of CP110 relative to the normalized tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 427 +/- 82 nm, CP110 start= 442 +/- 63 nm, CP110 end= 492 +/- 66 nm. (**F**) Images of centrioles during assembly and at mature stage stained for tubulin (magenta) and CP110 (yellow). The frieze shows that CP110 appears together with tubulin and persists during procentriole assembly until mature stage. Scale bar: 200 nm. (**G**) Evolution of the position of CP110 relative to tubulin growth during procentriole assembly. The growth of CP110 was represented as loess curve (red line). (**H**) Diameter evolution of CP110 during centriole assembly (relative to tubulin length). (**I**) Images of procentrioles and mature centrioles seen from top view. Scale bar: 200 nm.

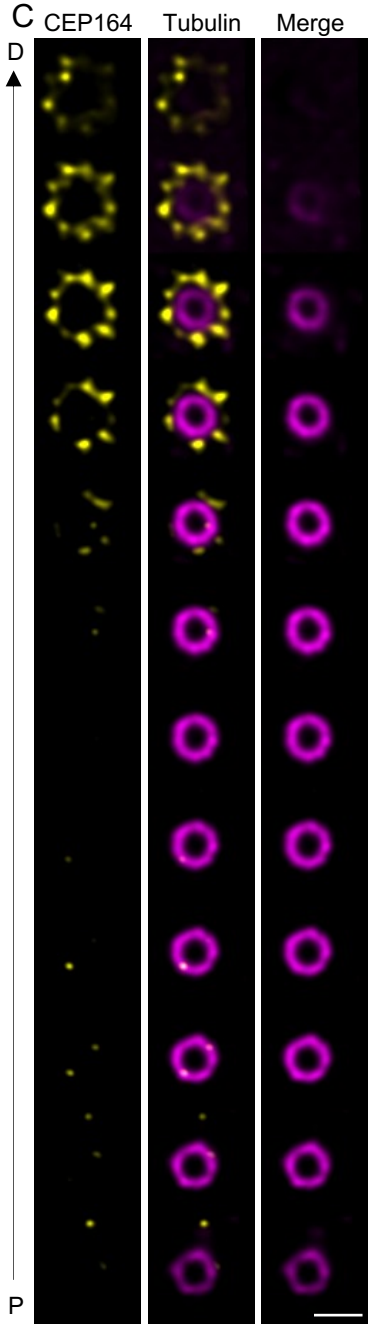
CEP164

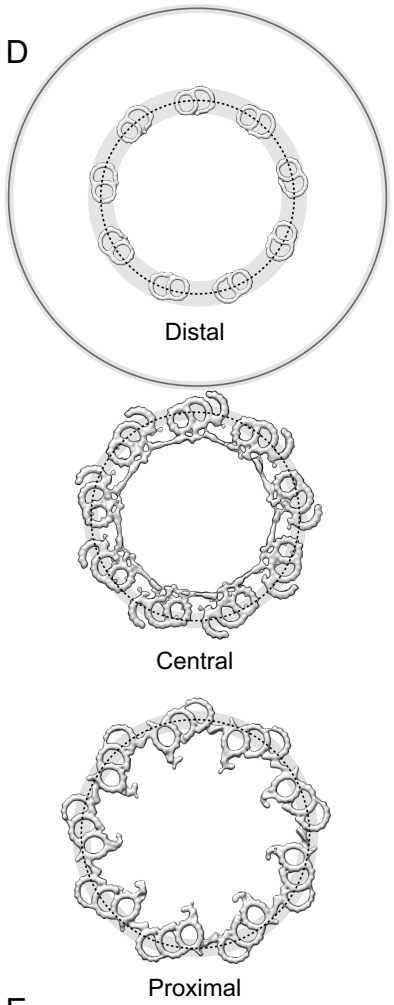
Localization
Distal

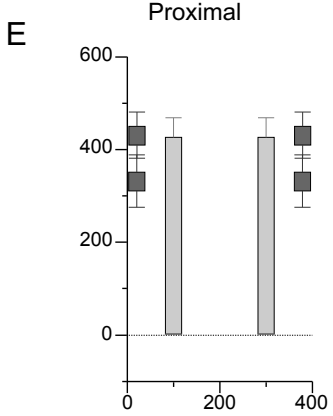
Special features
9-fold symmetry
Appears at mature centriole

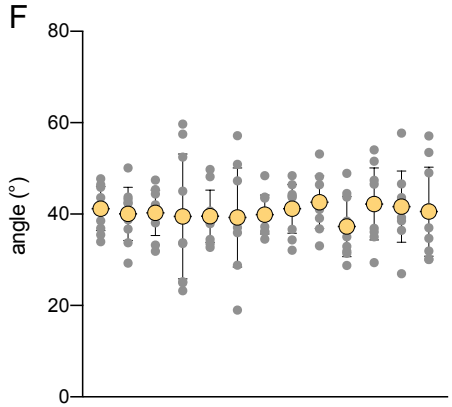


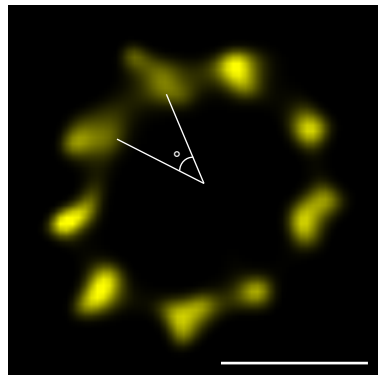


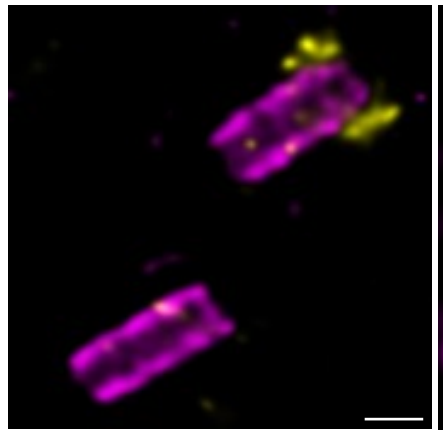


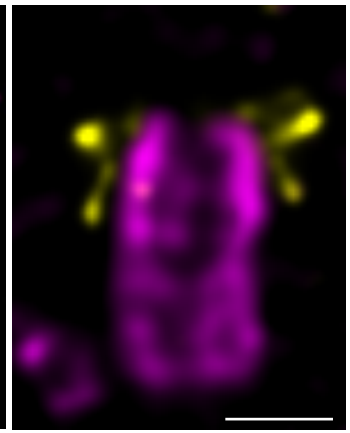




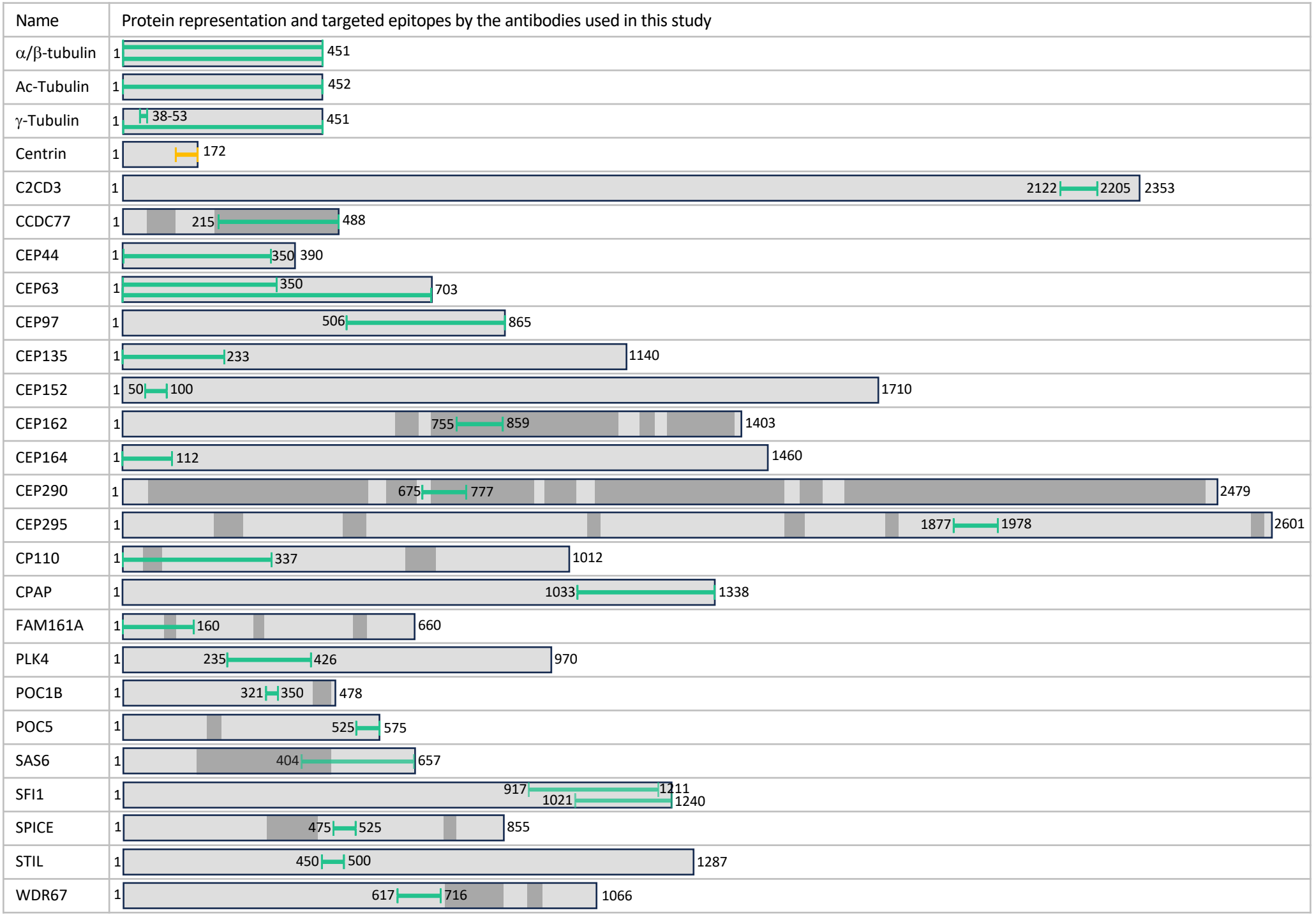








CEP164. (**A**) Measurement of CEP164 diameter in the indicated region of the centriole. Grey dots indicate the average diameter of the tubulin in the proximal (P), central (C) and distal (D) regions of mature centriole. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP164= 325.9 +/- 6.9 nm. n= 60, 55, 223 and 10 centrioles from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP164 respectively. (**B**) Measurement of CEP164 length in the indicated region of mature centrioles. Grey dots indicate the average length of the tubulin. Average +/- SD: Tubulin P, C, D= 432 +/- 56 nm, CEP164= 100.9 +/- 28.5 nm. n= 246 and 21 centrioles from 3 independent experiments for tubulin and CEP164 respectively. (**C**) Image montage through the z-axis of a top view mature centriole stained for tubulin (magenta) and CEP164 (yellow). The merge channel shows that CEP164 is restricted to the distal region where it is organized as 9 dots around the centriole. Scale bar: 200 nm. Z-step: 35 nm. (**D**) Representation of the radial position of CEP164 (grey line) relative to the tubulin signal, juxtaposed to a cryo-EM imaged of *chlamydomonas* centriole[10]. Black dotted circles indicate the tubulin signal, depicting the centriole diameter in the proximal, central and distal regions. These representations are based on measurements presented in B and normalized on the average tubulin diameter. Average +/- SD: Tubulin P= 196.3 +/- 18.8 nm, Tubulin C= 180.1 +/- 17.3 nm, Tubulin D= 168.3 +/- 18.8 nm, CEP164=326 +/- 7 nm. n= 60, 55, 223 and 10 from 3 independent experiments for tubulin P, tubulin C, tubulin D and CEP164 respectively. (**E**) Radial and longitudinal positions of CEP164 relative to tubulin signal. Grey histograms represent the tubulin signal, depicting the centriole length. Average +/- SD: Tubulin start= 0+/- 0 nm, Tubulin end= 432 +/- 56 nm, CEP164 center of mass 1= 334 +/- 37 nm, CEP164 center of mass 2= 435 +/- 30 nm. (**F**) Angle measurement between each CEP164 dot from top view centrioles stained for Tubulin (not shown) and CEP164 (yellow). Scale bar : 200 nm. Average +/- SD: 41.2 +/- 4.8, 40.0 +/- 5.8, 40.3 +/- 4.9, 39.5 +/- 13.7, 39.5 +/- 5.7, 39.3 +/- 10.8, 39.9 +/- 4.3, 41.2 +/- 5.3, 42.6 +/- 5.8, 37. 3 +/- 6.6, 42.2 +/- 7.9, 41.6 +/- 7.8, 40.6 +/- 9.7. n=13 centrioles from 3 independent experiments. (**G**, **H**) Images of centrosome stained for tubulin (magenta) and CEP164 (yellow) showing that CEP164, a canonical marker for distal appendages, is only present at one of the two centrioles. Note that we can distinguish the two localizations as described in literature. Scale bars : 200 nm.


Name
Protein representation and targeted epitopes by the antibodies used in this study
α/β-tubulin
1
451
Ac-Tubulin
1
452
γ-Tubulin
1
38-53
451
Centrin
1
172
C2CD3
1
2122
2205
2353
CCDC77
1
215
488
CEP44
1
350
390
CEP63
1
350
703
CEP97
1
506
865
CEP135
1
233
1140
CEP152
1
50
100
1710
CEP162
1
755
859
1403
CEP164
1
112
1460
CEP290
1
675
777
2479
CEP295
1
1877
1978
2601
CP110
1
337
1012
CPAP
1
1033
1338
FAM161A
1
160
660
PLK4
1
235
426
970
POC1B
1
321
350
478
POC5
1
525
575
SAS6
1
404
657
SFI1
1
917
1211
1021
1240
SPICE
1
475
525
855
STIL
1
450
500
1287
WDR67
1
617
716
1066

Targeted epitopes of the antibodies used in this study. Each light grey bar represents the full length protein studied in this article. Dark grey blocks depict the position of coil-coiled regions. Green bars indicate the specific region targeted by the antibodies listed in table S1. The yellow bar indicates the C-ter region of centrin targeted by the antibody, but the exact number of amino acids is not known.