

# Molecular basis for the activation of outer dynein arms in cilia

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In the format provided by the  
authors and unedited

## Supplementary Figure 1

### Dnaaf9-GFP sequence (only partial sequence of GFP shown)

(yellow: DNAAF9 sequence; green: part of GFP tag sequence;  
red: synonymous mutation)

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ATCCCATCGATTCTGAATTC AAGGCTCTCGAGCCATGCTTTCTAAATACCAAACAACGAACATGGCTGCTATAAG
GAAAAACAAATCTTCTATAATGACCGCTGCCGTAAGCTGCTCCCGCTTACGACAGGTCCAGGCTCTTCTAAGGGA
TGATGTCAATACAGCTCCAGATGGCATCCTTTGCTCCCTGGGTATTGACAGCCGCTACAATGAAGGCTGCAGTGA
GCTGGCCAGCTACCTTTTCTGCGGTTTGTACAACCACAACCATTTTGTGACATGGAGCAGATTCCAGAGGATTTCCC
TGAGGAAGTACTGGATGATGTGATCATCCTTATTAAGGCAGAGTGTGTGCATTTGTACTGCAACCCAGTGAATTA
TGGGTACCTGCTTCCCTATGTATCTCACTGGAGGAATTTACAACCTTCATTGTCTGACTGAAACAGAGTACGAGGA
TGAAGAGGTTGCAGAGGAATTTAAGATCTCCAGTTTTGTGTCCATGGTTCAAGATTGCCATTGTATTGGAATCCC
CTACAGTTCTCATGGACACGTTTCAAGATTCGATATGTTTCATGTTGGAGAAAATGGCCCATTCATTAGGCATTTGC
CTTGGAAGGAATTGGAGCTGGACTGTTTTTACCATTGAAATATAAGCTCAAAGATGTAAGTCAGAGACTCTGGCA
AGTCTACAGCAGATTGGACCCTGTGTCTCTGGACTGCCTTCTCAATGAGGACCTTCAGTTGTTTGAAAGACAATG
GAGCTGTTTGTCTCCAGTATGGAAATTGAAAGTGCTCTGTCCATGCAGGAGCTGTCAGAGGCCAAGTTGCAGA
GCCTTTTCAAGACATATTATTTCGCATGGTCTTATTTCCAGCAATATTACAGACAAGAGTAAAAGCAGGCAGCCATT
TGTCTTGTGTGGAAGTCACTCCACTAAGGAAGATTTGGAAAGCTATTGTTTCACCTTCCCCTCTGAAGGCCATCA
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GGCCTGTGCTCGAACCTATTTTTTTTGGAAACACACATGTCCCATACTTGGGAAATAACAACACTCAGCAGAGGAG
GACAGATCTCCAGGTGCTTTTACATATCTACTCAGCGGCAATTCAGTCTGTACTAGCAGGAATCAAATGTTTTTC
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TGAGCGCTTTAACAGAGAGGTGGACCTGCAGCCACACGCTGACCTCTTCGACCCAATCTAGATGAGTAAAGGAGA
ACTTTTCACTGGAGTTGTCCCAATTCTTGTGTAATTAGATGGTGATGTAAGGCC
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**Translated DNAAF9 protein sequence with c-terminal GFP tag**

SHRFEFKASRAMLSKYQTTNMAAIRKNKSSIMTAAVSCSRLRQVQALLRDDVNTAPDGILCSLGIDSR  
YNEGCSELASYLFCGLYNHNFDMEQIPEDFPPEVLDDVILILIKAECVHLYCNPVNYGYLLPYVSHWR  
NLQLHCLTETEYEDEEVAAEEFKISSFVSMVQDCHCIGIPYSSHGHVQKFDMMLEKWPIIQAFALGI  
GAGLFFTMKYKLKDVSQRLWQVYSRLDPVSLDCLLNEDLQLFERQWSCLFSSMEIESALSMQELSEAQ  
VAEPFRITYYSHGLISSNITDKSKSRQPFVLEFGSHSTKEDLESYCFTFPSEGHQVRNTGPSGGVAKHML  
LQCVAPKGPLACARTYFFGNTHVPYLGNNNTQQRRDLDLQVLSHIYSAAIQSVLAGIKCFSINSSASKA  
KDVAQDTFQLALESFGLIQYKGALRSKAVFSIQAVNNKGSIVPLSDEDSHFLVKTASMMVYDIPDLQC  
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TCLGIPITVRDSAYMFSNSLLSTPEEGKLVFFSEGLFVHPHGSITLSMSHINSIKLYDGASLSDIS  
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KSMYFRLLKLHETHAVPANHRVVLRTAYPQLPEQDRFLQHFAISSSVDEESVCSDHLSTVFSDTIPES  
TKPEPKKKVVLTIAGLPGSHKENLCDFLMEVNQNSSRWEVFCPALEGSGEFSASHLQRFLLSLLAKQ  
RETDMNSTRVLLIPGYTDIMDVIQAITAHPDPQVHSQVTVGAVSACVNPLTSFIKHRLLFPKLLQEC  
SQGIVSNVVFTGLTMEQKHPLQLHMQQLIRAANLSTAFISAEKGAVRRTEDLRLILNDSSFSQPHMVN  
ARYLLYPGWWEGRFVSGSGSLSMSQHRVEFSRPLERLALFLQRCKALKSSLKPSPTGNIYHISGKVL  
SDNDRQMVVNCNSISGNVTVAPDQGTTHGLWTTNNCYLMFHGVGLTQEGKDWLRHCAKQKIVKKVKK  
NQRTLTTEEIKYIHLKRHLDPPLPGYFYNGHHFVSFFGEKQNFHPLMDRFIDEYVQDANKEIERFNRE  
VDLQPHADLFDPSRMSKGELFTGVVPILVELDGDVRP

## Dnaaf9-myc sequence (5xmyc tag, only partial sequence of myc tag shown)

(yellow: DNAAF9 sequence; light blue: part of myc tag sequence; red: synonymous mutation)

GAGCTCTGGTTCTTTTTGCGAGATCCCATCGAACCATGCTTTCTAAATACCAAACAACGAACATGGCTGCTATAA  
GGAAAAACAAATCTTCTATAATGACCGCTGCCGTAAGCTGCTCCCGCTTACGACAGGTCCAGGCTCTTCTAAGGG  
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CTGAGGAAGTACTGGATGATGTGATCATCCTATTAAGGCAGAGTGTGTGCATGTGACTGCAACCCAGTGAATT  
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TTGGGGAGAAGCAAAACTTCCATCCTCTGATGGATCGATTTCATCGATGAATACGTGCAGGACGCCAATAAGGAGA  
TTGAGCGCTTTAACAGAGAGGTGGACCTGCAGCCACACGCTGACCTCTTCGACCCAATCGATTCTAAAGCTATGG  
AGCAAAAGCTCATTTCTGAAGAGGACTTGAATGAAATGGAGCAAAAGCTCATTTCTGAAGAGGACTTGAATGAA

Translated DNAAF9 protein sequence with c-terminal 5xmyc tag

ALVLFAGSHRTMLSKYQTTNMAAIRKNKSSIMTAAVSCSRLRQVQALLRDDVNTAPDGILCSLGIDSR  
YNEGCSELASYLFCGLYNHNHFDMEQIPEDFPEEVLDDEVIIILIKAECVHLYCNPVNYGYLLPYVSHWR  
NLQLHCLTETETEYEDEEVAEEFKISSFVSMVQDCHCIGIPYSSHGHVQKFDMFMLEKWPIIQAFALEGI  
GAGLFFTMKYKLDVSRQLWQVYSRLDPVSLDCLLNEDLQLFERQWSCLFSSMEIESALSMQELSEAQ  
VAEPFRTYYSHGLISSNITDKSKSRQPFVLFSGHSTKEDLESYCFTFPSEGHQVRNTGPSGGVAKHML  
LQCVAPKGPLACARTYFFGNTHVPYLGNNNTQQRRTDLQVLSHIYSAAIQSVLAGIKCFSINSSASKA  
KDVADQTFQLALESFGLIQYKGALRSKAVFSIQAVNNKGSIVPLSDEDSHFLVKTASMMVYDIPDLQC  
GGNLGSVVFSESFLESSVYIQQRD GALSSDSCFTVLTSSI PRYVSWLVDEAEVRMSEQAQHLLKAEDS  
TCLGIPITVRDSAYMFSNSLLSTPEEGKLVFFSEGLFVHPHGSITLSMSHINSIKLYDGASLSDIS  
MLFIEYQTSLLPHLPFPLHSSDFSLAVALLPRTKSYKSFYSQVLPAWRKSESGLRVQHVLNDQLSPEH  
KSMYFRLLKLHETHAVPANHRVVLRTAYPQLPEQDRFLQHFAISSSVDEESVCSDDLSTVFSDTIPES  
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RETD MN SFRVLLIPGYTDIMDVIQAITAHPDPQVHSQVTVGAVSACVNPLTSFIKHRLLFPKLLQEQ  
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ARYLLYPGWWEGRFVSGSGSLSMSQHRVEFSRPLERALFLQRCKALKSSLKPSPTGNIYHISGKVL  
SDNDRQM VVNCNSISGNVTVAPDQGTHHGLWTTNNCYLMFHGVGLTQEGLDWLRHCAKQKIVKKVKK  
NQRTLTTETEEKYIHLKRHLDP LPPGYFYNGHHFVSFFGEKQNFHPLMDRFIDEYVQDANKEIERFNRE  
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