

sy680 is a novel allele of *pkd-2*

Allyson Whittaker¹, Gary Schindelman¹, Shala Gharib¹ and Paul W. Sternberg^{1,2§}

¹Division of Biology and Biological Engineering, California Institute of Technology, Pasadena, California, USA

²Howard Hughes Medical Institute, California Institute of Technology, Pasadena, California, USA

[§]To whom correspondence should be addressed: pws@caltech.edu

A.

```

N2:                F G Y
N2:                TGCATTGCGCACAGTTTGGATATTTGTGCTT
sy680:            TGCATTGCGCACAGTTTAGATATTTGTGCTT
sy680:                F R Y
    
```

B.

```

C. elegans PKD-2  TKTGVNVRVNSVIENGLTNAPFDDVTSSSENSYLNIAKACVVVFVAWVKVFKFISVNKTMSQLS 438
H. sapiens PKD2  TSN-VEVLLQFLEDQNTFFPNFEHLAYWQIQFNIAAVTVFFVWIKLKFIFNFRNTMSQLS 587
                *..*:::..*: * *::: :.:** * .**.*:*:*****. *:*****

C. elegans PKD-2  STLTRSAKDIGGFAVMFAVFFFAFAQFGYLCFGTQIADYSNLYNSAFALLRLLILGDFNFS 498
H. sapiens PKD2  TTMSRCAKDLFGFAIMFFIIFLAYAQLAYLVFGTQVDDFSTFQECIFTQFRIILGDINFA 647
                *:*:*.***: ***:** :*:*:*:*.** *****: *:*.: :. *: :*:*****:***:

C. elegans PKD-2  ALESCNRFFGPAFFIAYVFFVSFILLNMFLAIINDSYEVVKAELARKKDGEGILDWFMNK 558
H. sapiens PKD2  EIEEANRVLGPIYFTTFFVFFMFFILLNMFLAIINDTYSEVKSDLAQQKAEMELSDLIRKG 707
                :*..**.:** :* :*:***: *****:***:***:***: * : * : :
    
```

A. The position of lesion in the *pkd-2* DNA sequence. B. Location of lesion in an alignment of *C. elegans* and human proteins. Position of substitution shown in red.

Description

Summary a new allele of *pkd-2* was isolated in a behavioral genetic screen for male mating defects, and found to result in a substitution of Arginine for Glycine in the equivalent of human PKD2 alanine 615.

Article

The *C. elegans* ortholog of polycystin-2 is encoded by *pkd-2* (Barr et al., 2001). From an EMS screen of a *plg-1*; *him-5* strain for male mating defective mutants and a secondary behavioral screen for defects in discrete steps of male mating behavior, namely response to contact to hermaphrodites and vulval location (described in Schindelman et al., 2006), we identified a new allele of *pkd-2* based on mapping and complementation. *sy680* fails to complement *pkd-2(sy606)* for defects in response to contact with hermaphrodite and vulval location. Here we report the sequence of this allele. PCR amplification and sequencing of *pkd-2* exons indicated that there was a c→t transition in the transcribed DNA strand (g→a in the *pkd-2* sense strand; Figure 1A). This change leads to an altered codon, a Glycine to Arginine substitution the PKD-2 protein. This position corresponds to A615 of the human protein (Figure 1B).

Reagents

Strains:

PS7518 *plg-1(e2001d)* III; *pkd-2(sy680)* IV; *him-5(e1490)* V

PS3400 *pkd-2(sy606)*

References

9/28/2017 - Open Access

Barr MM, DeModena J, Braun D, Nguyen CQ, Hall DH, Sternberg PW. The *Caenorhabditis elegans* autosomal dominant polycystic kidney disease gene homologs *lov-1* and *pkd-2* act in the same pathway. *Curr Biol*. 2001 Sep 4;11(17):1341-6. PMID: 11553327.

Schindelman G, Whittaker AJ, Thum JY, Gharib S, Sternberg PW. Initiation of male sperm-transfer behavior in *Caenorhabditis elegans* requires input from the ventral nerve cord. *BMC Biol*. 2006 Aug 15;4:26. DOI: 10.1186/1741-7007-4-26 | PMID: 16911797. | PMCID: PMC156441.

Funding: Supported by the Howard Hughes Medical Institute (047-101), with which PWS is an investigator.

Reviewed By: [Bob O'Hagan](#)

History: Received September 13, 2017 Accepted September 28, 2017 Published September 28, 2017

Copyright: © 2017 by the authors. This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International (CC BY 4.0) License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Citation: Whittaker, A; Schindelman, G; Gharib, S; Sternberg, PW (2017). *sy680* is a novel allele of *pkd-2*. *microPublication Biology*. <https://doi.org/10.17912/W2SW9M>