



**HAL**  
open science

## Cancer and loneliness in *Drosophila*

Ana R Rivero

► **To cite this version:**

Ana R Rivero. Cancer and loneliness in *Drosophila*. Peer Community In Evolutionary Biology, 2017, pp.100030. 10.24072/pci.evolbiol.100030 . hal-01597914

**HAL Id: hal-01597914**

**<https://hal.science/hal-01597914>**

Submitted on 29 Sep 2017

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NoDerivatives 4.0 International License



## Cancer and loneliness in *Drosophila*

Ana Rivero

MIVEGEC, CNRS -- Montpellier, France  
[ana.rivero@cnrs.fr](mailto:ana.rivero@cnrs.fr)  
doi: [10.24072/pci.evolbiol.100030](https://doi.org/10.24072/pci.evolbiol.100030)

Cite as: Rivero A. 2017. Cancer and loneliness in *Drosophila*. *Peer Community in Evolutionary Biology*, 100030. doi: [10.24072/pci.evolbiol.100030](https://doi.org/10.24072/pci.evolbiol.100030)

### Open Access

### A recommendation of

Dawson E, Bailly T, Dos Santos J, Moreno C, Devilliers M, Maroni B, Sueur C, Casali A, Ujvari B, Thomas F, Montagne J, Mery F. 2017. **An interaction between cancer progression and social environment in *Drosophila***. *BiorXiv*, 143560, ver. 3 of 19th September 2017. doi: [10.1101/143560](https://doi.org/10.1101/143560)

Published: 20th September  
2017

Copyright: This work is licensed  
under the Creative Commons  
Attribution-NoDerivatives 4.0  
International License. To view a  
copy of this license, visit  
<http://creativecommons.org/licenses/by-nd/4.0/>

*Drosophila* flies may not be perceived as a quintessentially social animal, particularly when compared to their eusocial hymenopteran cousins. Although they have no parental care, division of labour or subfertile caste, fruit flies nevertheless exhibit an array of social phenotypes that are potentially comparable to those of their highly social relatives. In the wild, *Drosophila* adults cluster around food resources where courtship, mating activity and oviposition occur. Recent work has shown not only that social interactions in these clusters condition many aspects of the behaviour and physiology of the flies [1] but also, and perhaps more unexpectedly, that social isolation has a negative impact on their fitness [2].

Many studies in humans point to the role of social isolation as a source of stress that can induce and accelerate disease progression. The ultimate proof of the connection between social interaction and disease is however mired in confounding variables and alternative explanations so the subject, though crucial, remains controversial. With a series of elegant experiments using *Drosophila* flies that develop an inducible form of intestinal cancer, Dawson et al [3] show that cancer progresses more rapidly in flies maintained in isolation than in flies maintained with other cancerous flies. Further, cancerous flies kept with non-cancerous flies, fare just as badly as when kept alone. Their experiments suggest that this is due to the combined effect of healthy flies avoiding contact with cancerous flies (even though this is a non-contagious disease), and of cancerous flies having higher quality interactions with other cancerous flies than with healthy ones. Perceived isolation is therefore as pernicious as real isolation when

it comes to cancer progression in these flies. Like all good research, this study opens up as many questions as it answers, in particular the why and wherefores of the flies' extraordinary social behaviour in the face of disease.

## References

- [1] Camiletti AL and Thompson GJ. 2016. *Drosophila* as a genetically tractable model for social insect behavior. *Frontiers in Ecology and Evolution*, 4: 40. doi: [10.3389/fevo.2016.00040](https://doi.org/10.3389/fevo.2016.00040)
- [2] Ruan H and Wu C-F. 2008. Social interaction-mediated lifespan extension of *Drosophila* Cu/Zn superoxide dismutase mutants. *Proceedings of the National Academy of Sciences, USA*, 105: 7506-7510. doi: [10.1073/pnas.0711127105](https://doi.org/10.1073/pnas.0711127105)
- [3] Dawson E, Bailly T, Dos Santos J, Moreno C, Devilliers M, Maroni B, Sueur C, Casali A, Ujvari B, Thomas F, Montagne J, Mery F. 2017. An interaction between cancer progression and social environment in *Drosophila*. *BiorXiv*, 143560, ver. 3 of 19th September 2017. doi: [10.1101/143560](https://doi.org/10.1101/143560)

## Appendix

Reviews by Ana Rivero and Silvie Huijben: <http://dx.doi.org/10.24072/pci.evolbiol.100030>