MedicalXpress

A study on cell migration provides insights into the movement of cancer cells

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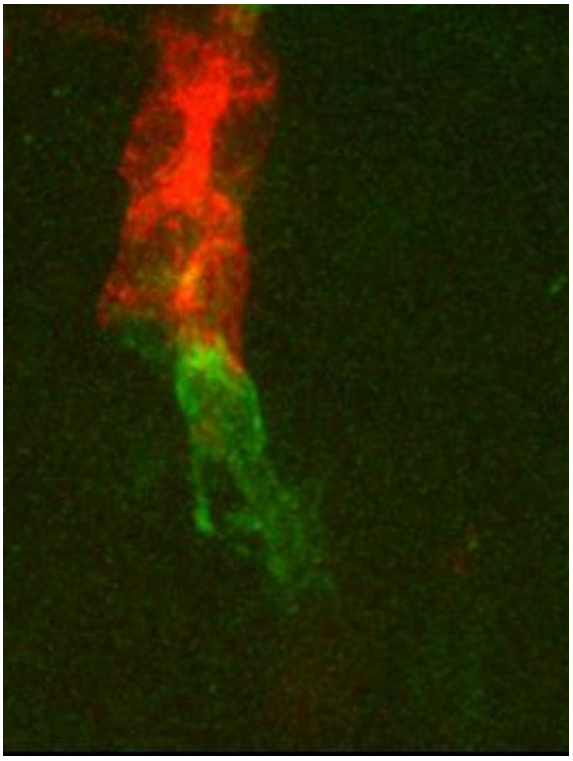


This image shows trachea development in the *Drosophila* fly; the leading cell (Green) is dragging the group of six cells (red). Credit: Gaëlle Lebreton, IRB Barcelona

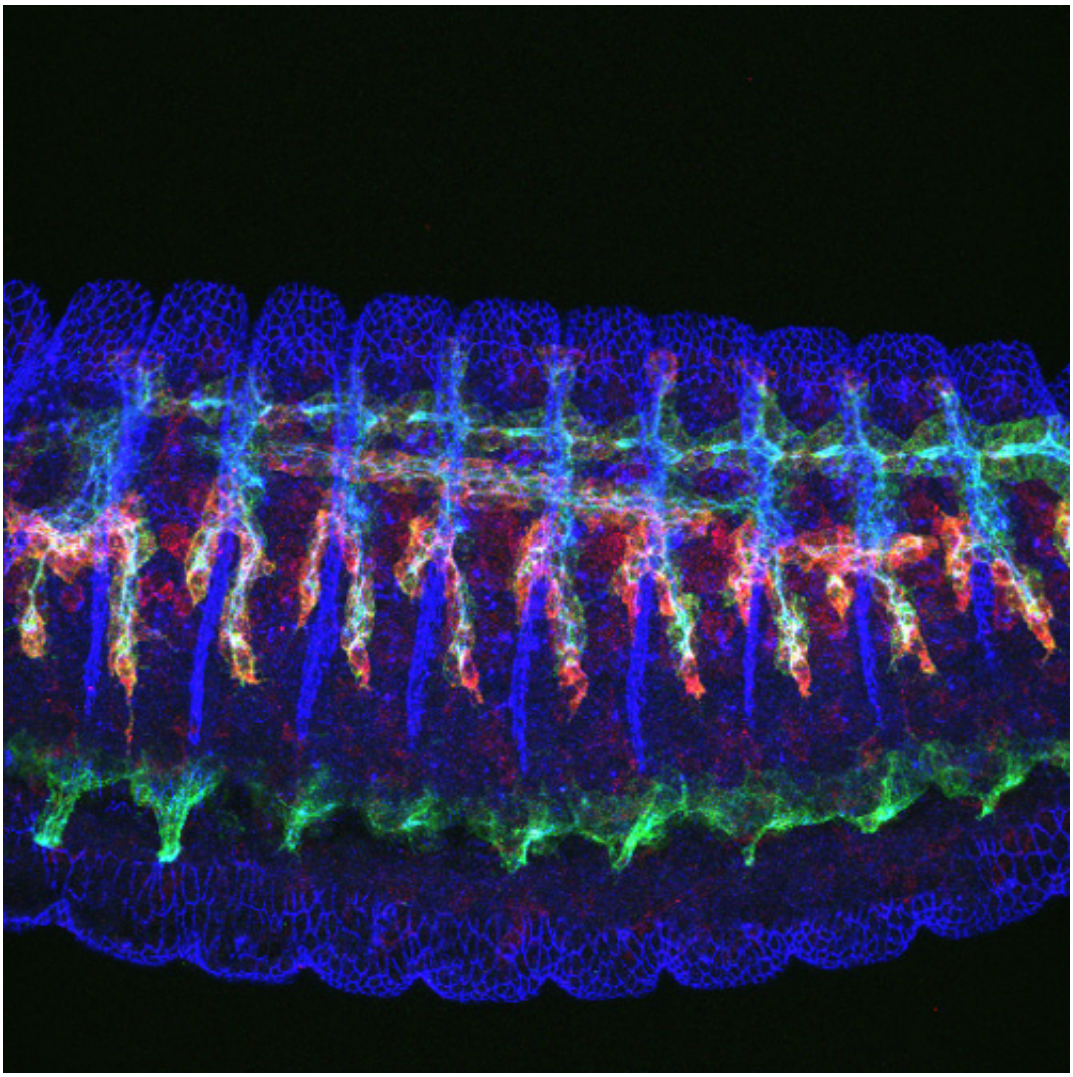
Jordi Casanova, head of the "Morphogenesis in *Drosophila*" lab at IRB Barcelona and CSIC research professor, and Gaëlle Lebreton, postdoctoral fellow in the same group, have published a study performed using *Drosophila melanogaster* in the *Journal of Cell Science*. This work

reveals that in a multiple movement, a single cell can act as the leader and can drag the rest with it. The scientists have studied the tracheal development of *Drosophila* in vivo and describe the morphological characteristics of the leading cell and provide molecular details about how it drives the movement.

"Cancer researchers are keen to know how cells are organized to achieve migration and to form new capillaries to feed an expanding cancerous tumor," explains Gaëlle Lebreton, first author of the article. "Our study gives new data about how angiogenesis might arise," comments the French scientist at IRB Barcelona. Angiogenesis or the formation of new blood vessels is a critical process in the context of cancer because it is one of the steps that mark the transformation of a benign tumour into a malignant one. The formation of new blood vessels involves the synchronized movements of groups of cells. In this regard, understanding how these groups work will open up new research lines on angiogenesis.

Over seven hours, the scientists tracked a group of seven cells that form one of the tracheal branches of the fly *Drosophila melanogaster* in its first hours of development. The leading cell is the only one that has receptors for the growth factor FGF. The FGF signal stimulates a cascade of reactions in this cell in order to generate sufficient energy and to turn it into the promoter of motility.

"This is a novel piece of work because we monitored the entire process in vivo and because it is the first time we have seen, in an experimental context, that a single cell can lead this multiple migration," says Casanova.



This is an image of a *Drosophila* embryo showing the tracheal branches in green. Credit: Gaëlle Lebreton, IRB Barcelona

It is important to note that the development of trachea in the *Drosophila* fly is similar to that of bronchia in humans. Consequently, this development is also of biomedical interest in order to unravel the basic processes involved in the formation of new tissue.

More information: Specification of leading and trailing cell features during collective migration in the Drosophila trachea Lebreton G,

Casanova J. *Journal of Cell Science*, 2013.