

doi: 10.1387/ijdb.113384ps

SUPPLEMENTARY MATERIAL

corresponding to:

**Bimodal distribution of motility and cell fate
in *Dictyostelium discoideum***

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The complete paper associated with this Supplementary Material can be found at: <http://dx.doi.org/10.1387/ijdb.113384ps>

Accepted: 22 December 2011. *Final, author-corrected PDF published online:* 16 January 2012. *Edited by:* Mieke Van Lijsebettens.

Supplementary Movies for this paper are available at: <http://dx.doi.org/10.1387/ijdb.113384ps>

Supplementary Movie M1:

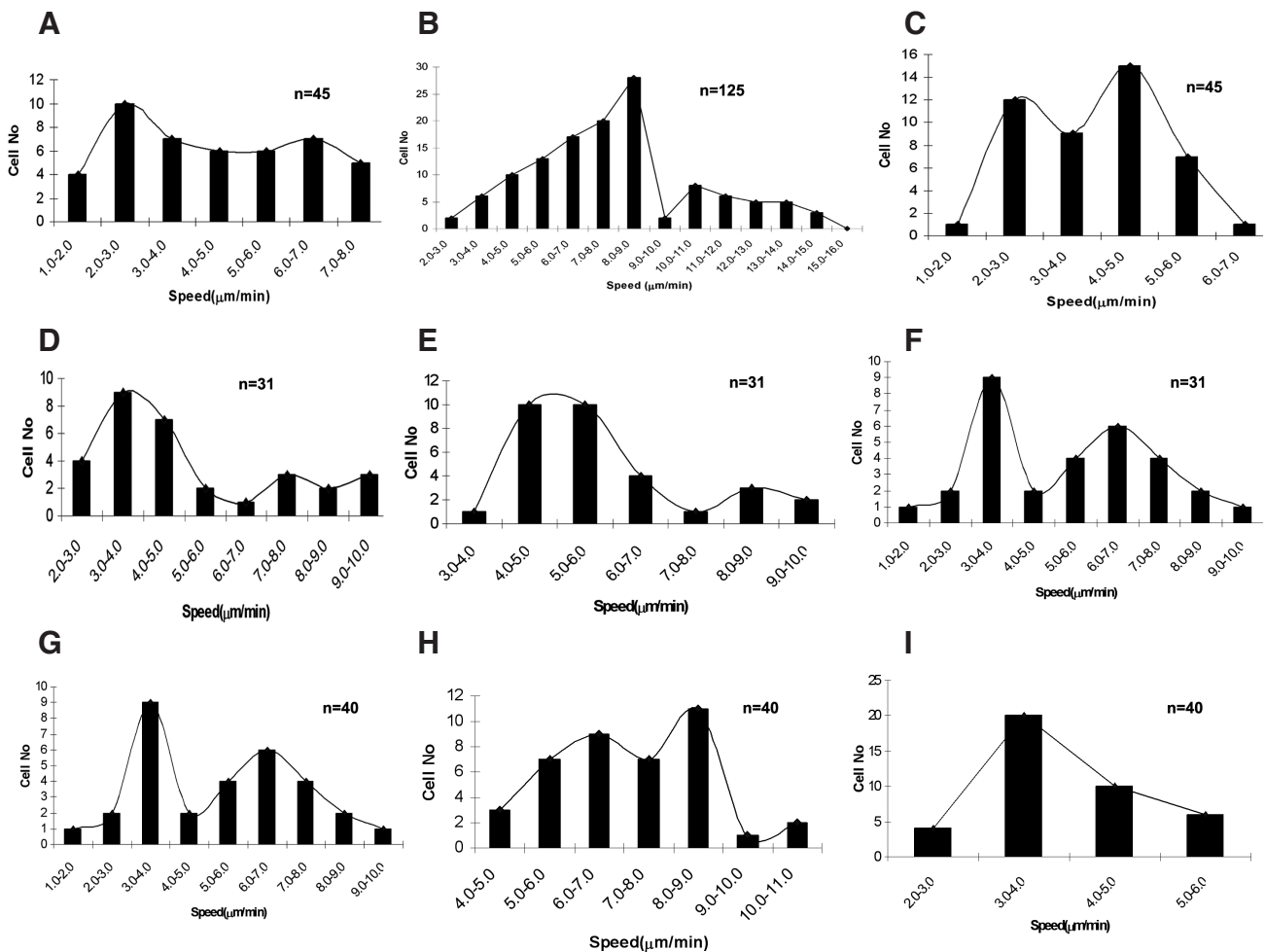
Time lapse movies of *D. discoideum* cells (20X) in nutrient medium, during early starvation and in replaced nutrient medium.

Supplementary Movie M2:

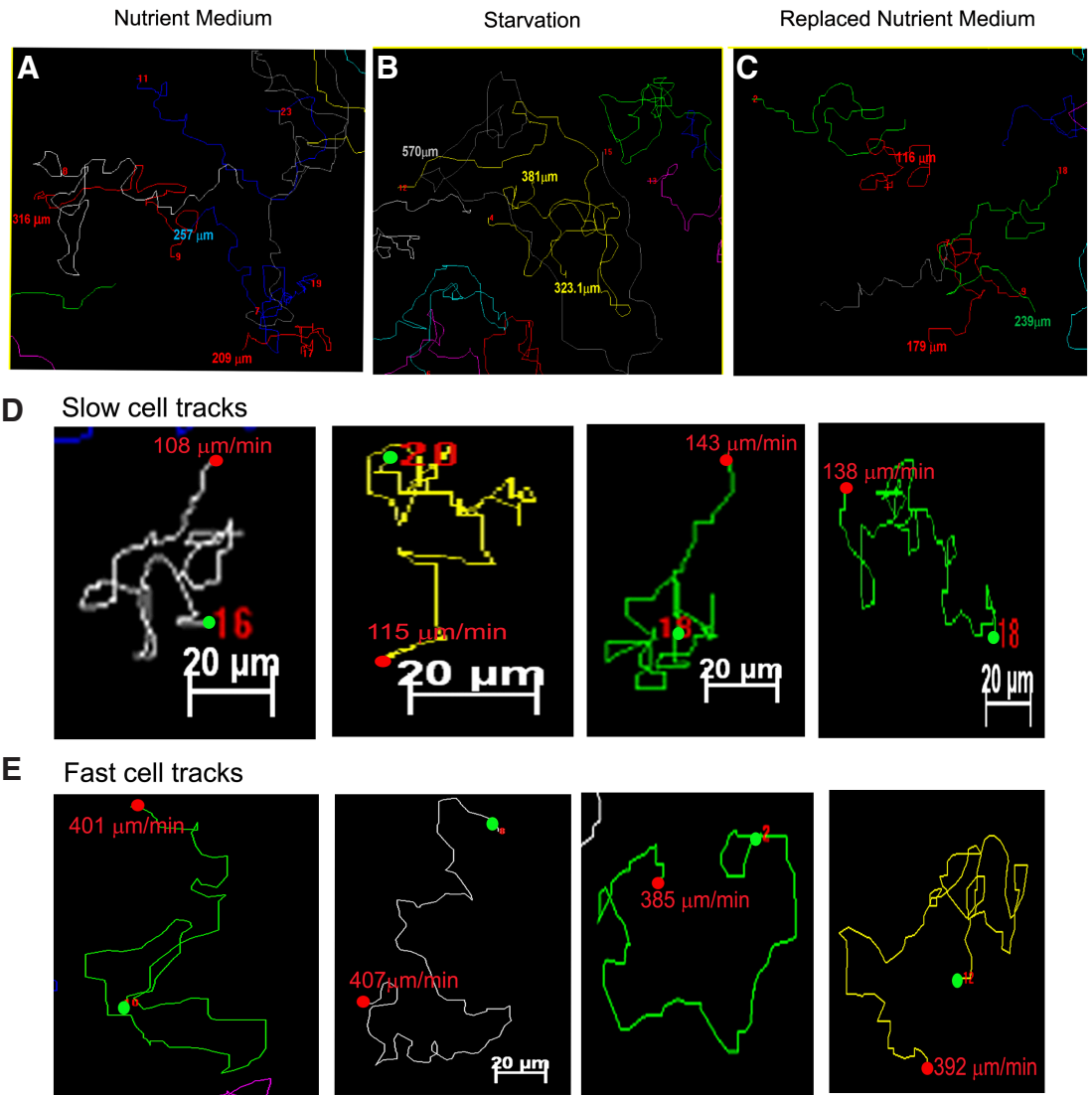
Time lapse movie of both linear moving and wriggling cells. White circle represents linear cell and black circle represents wriggling cell.

Supplementary Movie M3:

Time lapse movies of *D. discoideum* cells at a higher magnification (40X) in nutrient medium, during early starvation and in replaced nutrient medium.

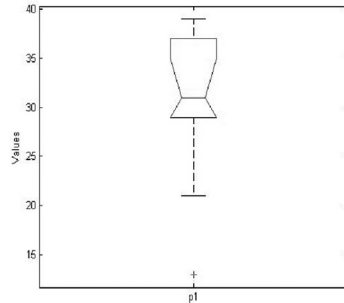


Supplementary Fig. S1. Bimodal distribution of cell motility in *AX2*, *Polysphondylium pallidum* and *Trishanku (triA)* cells under different nutrient conditions. Distribution of the speed of *AX2*, *Polysphondylium pallidum* and *Trishanku (triA)* cell motility under nutrient conditions (A,D,G), during starvation (B,E,H) and after replacement of the nutrient medium (C,F,I). Note the distinct bimodal distribution of the speed of cell motility during starvation in *AX2* cells (B) (n=125). 'n' represents the number of cells in each condition. During nutrient rich conditions, bimodality was not distinct. The results for these were obtained from the cell motility analyses for *AX2* shown in Fig. 1A. About 45 cells in each condition were analysed for the variation in cell motility.



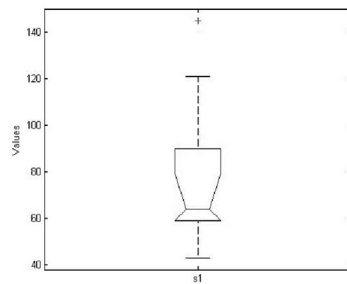
Supplementary Fig. S2. Images and tracks from cell motility movies of *D. discoideum* (AX2). (A-C) Cell motility tracks of AX2 cells in nutrient, starvation and replaced nutrient medium respectively. Images are taken from the final frame of the corresponding movie. The corresponding speed (μm) values are given along with the tracks. (D,E) Cell motility track overlays of calcium sorted slow and fast cells. Scale bar, 20 μm .

**A Mean Square Displacement:
Nutrient media**



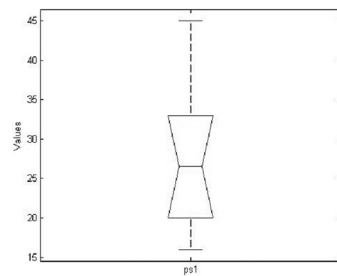
Source	SS	df	MS	F	Prob>F
Groups	595.6	9	66.1778		0
Error	0	0	NaN		
Total	595.6	9			

B Starvation



Source	SS	df	MS	F	Prob>F
Groups	9612	9	1068		0
Error	0	0	NaN		
Total	9612	9			

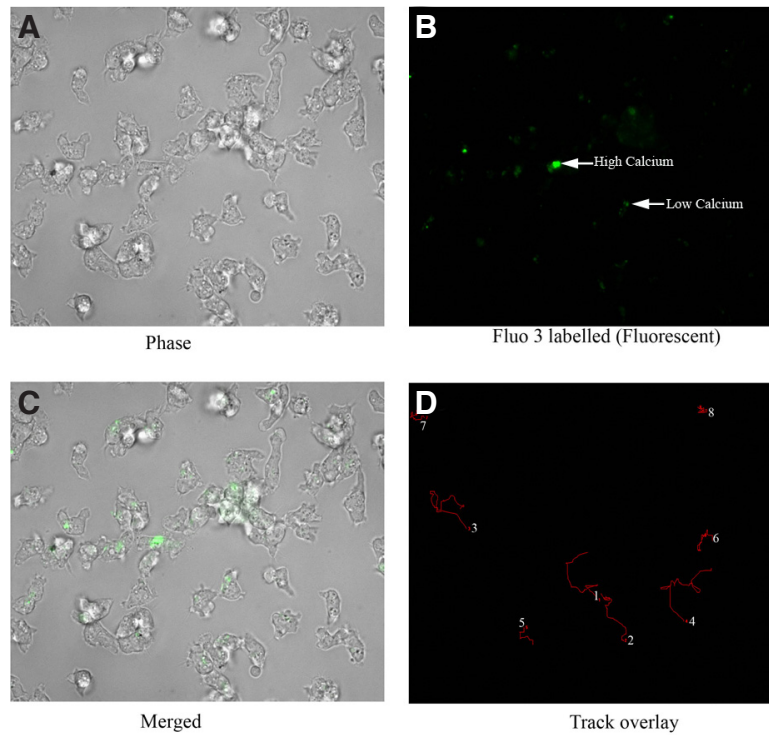
C Replaced Nutrient media



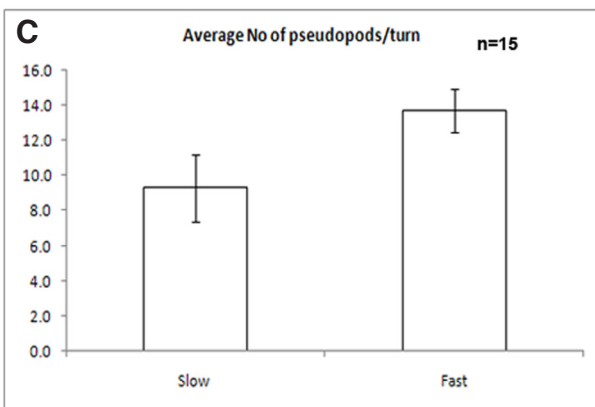
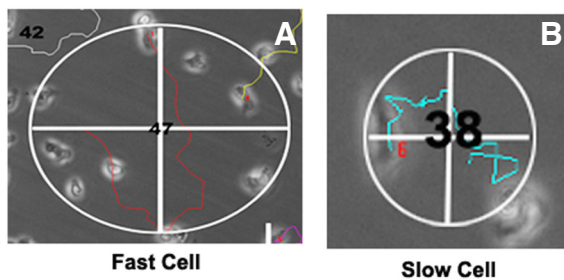
Source	SS	df	MS	F	Prob>F
Groups	662.5	9	73.6111		0
Error	0	0	NaN		
Total	662.5	9			

SS: Sum of Squares
df: Degree of freedom
MS: Mean Square.

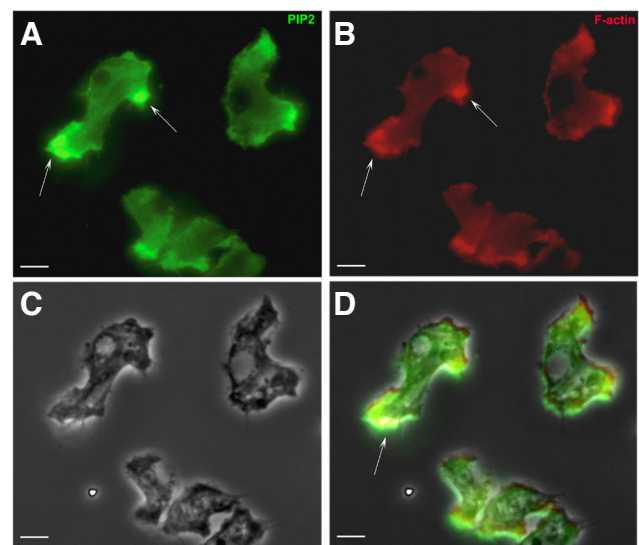
Supplementary Fig. S3. Mean square displacement. Mean square displacement of cells during nutrient condition (A), starvation (B) and replaced nutrient medium (C).



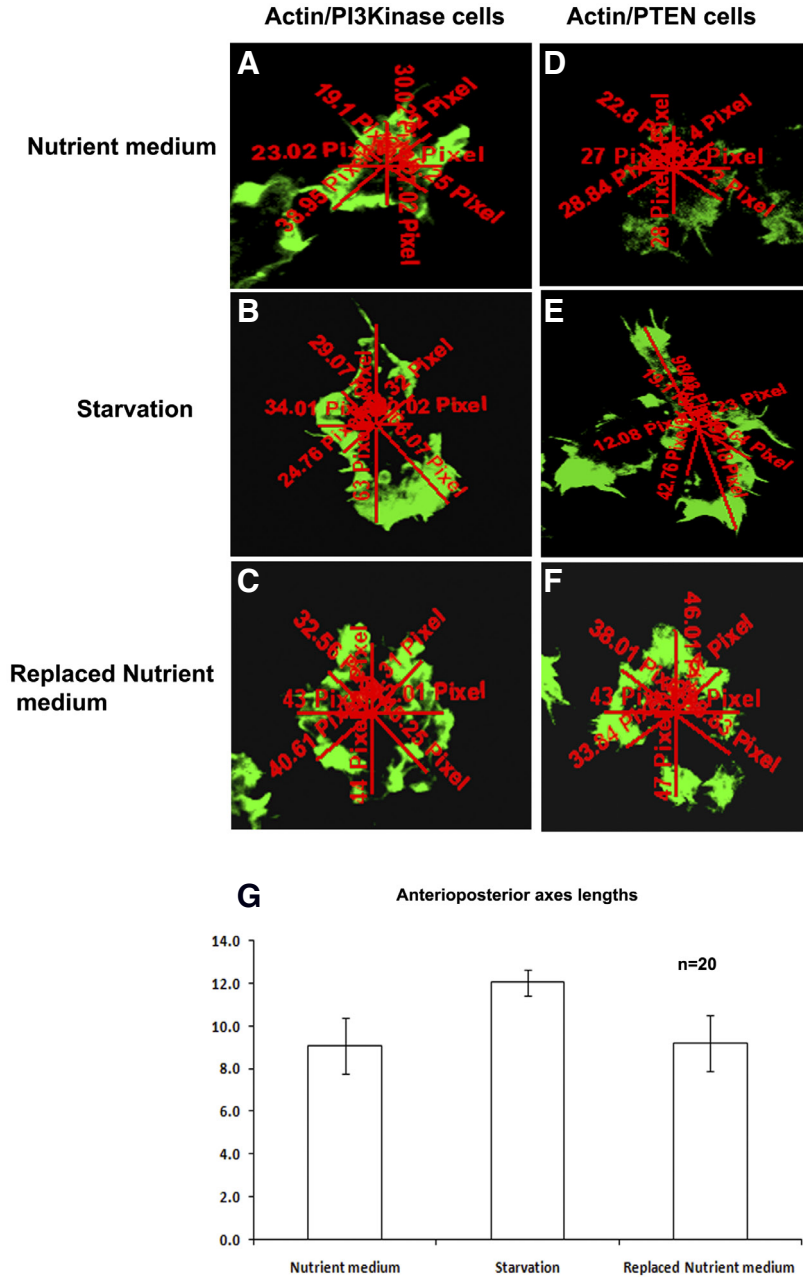
Supplementary Fig. S4. Images and tracks from Fluo-3 labelled and unlabelled cell motility movies of *D. discoideum* (AX2). (A-C) Fluo-3 labelled and unlabelled cells. (D) The tracks of Fluo-3 labelled cells (Track No: 1-4) that were longer and unlabelled cells showed wiggling type of motility (Track No: 5-8).



Supplementary Fig. S5 (Left). Average number of pseudopods/turn in AX2 cells. The representative tracks for Fast and Slow cells are shown in (A,B). (C) The average number of pseudopods/turn in both Fast and Slow category of cells. 'n' represents the number of cells analysed.



Supplementary Fig. S6 (Right). Localization of PIP2 and F-actin in the starved AX2 cells. Fluorescent images of PIP2 (green) (A) and F-actin by Rhodamine Phalloidin staining (red) (B) in the starved cells of AX2 strain. The phase contrast and the merged images are shown in (C,D) respectively. The arrow in (D) points to the co-localization of PIP2 and F-actin. Scale bar, 20 μ m.



Supplementary Fig. S7. Dimensions of *D. discoideum* cells under different nutrient conditions. Dimensions of cells stained with Actin/PI3Kinase and Actin/PTEN in nutrient medium (A,D), Starvation (B,E) and in replaced nutrient medium (C,F). Anterio-posterior axes lengths of AX2 cells under different nutrient conditions (G). 'n' indicates the number of cells analysed under each condition.

SUPPLEMENTARY TABLE 1

**DISPLACEMENT OF INDIVIDUAL AX2 CELLS
UNDER DIFFERENT NUTRIENT CONDITIONS**

Nutrient medium		
Cell No	Total Distance moved (μm)	Displacement from origin (μm)
1	71.8	12.9
2	77.7	21.4
3	94.0	28.8
4	101.4	29.3
5	105.0	29.7
6	107.2	32.2
7	113.7	32.6
8	119.7	36.7
9	149.7	38.6
10	155.0	39.2

Starvation		
Cell No	Total Distance moved (μm)	Displacement from origin (μm)
1	115.5	42.8
2	119.6	50.1
3	121.3	58.7
4	122.6	59.6
5	145.3	62.0
6	147.8	65.9
7	157.8	83.7
8	162.8	90.2
9	185.3	120.6
10	191.8	144.7

Replaced Nutrient medium		
Cell No	Total Distance moved (μm)	Displacement from origin (μm)
1	36.4	15.9
2	43.5	18.9
3	49.3	19.8
4	51.9	24.5
5	52.1	26.1
6	52.5	26.6
7	54.4	32.2
8	55.8	33.0
9	61.2	33.3
10	78.0	44.6

Data has been taken from the Movie shown in Supplementary Movie M1 and represents the movement during first 10 minutes of the movie.