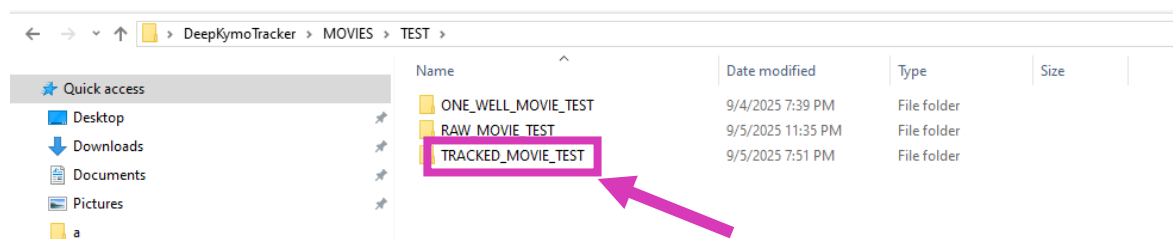


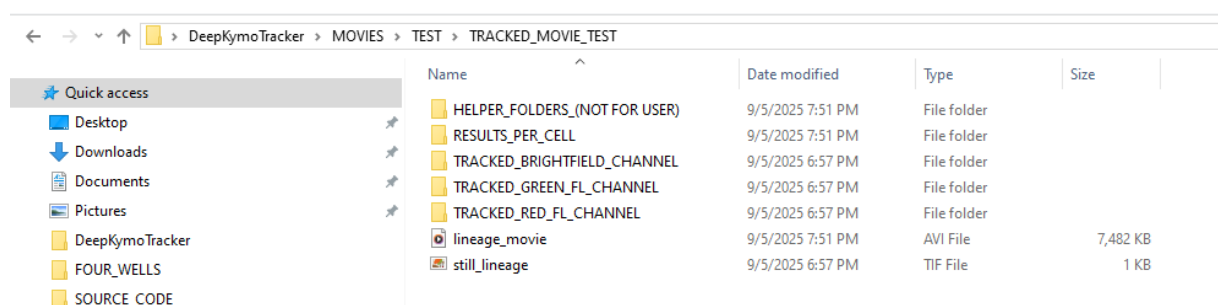
5. OUTPUT LAYOUT EXPLANATION

(User Guide)

Here is what to expect after applying the whole pipeline of DeepKymoTracker to an example movie named ONE_WELL_MOVIE_TEST. The output is stored in MOVIES\ TEST\ **TRACKED_MOVIE_TEST** folder:

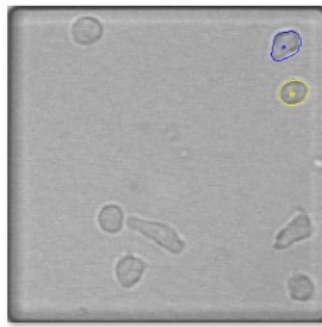


Inside this folder, you will see a number of subfolders. Their contents will be described below. Also, you will see **linage_movie.avi** whose name speaks for itself: this is an animated output cell movie (brightfield channel) coupled with the cell lineage changing dynamically. The file **still_lineage.tif** is just an image of the whole lineage.

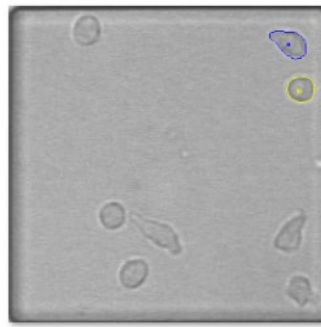


The folder **TRACKED_BRIGHTFIELD_CHANNEL** contains frames with the tracked and segmented cells represented in the brightfield channel. In our example movie ONE_WELL_MOVIE_TEST, we tracked only 2 cells, their names are **a** and **b**.

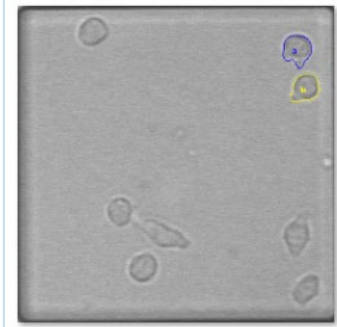
TEST > TRACKED_MOVIE_TEST > TRACKED_BRIGHTFIELD_CHANNEL



exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3417_ch02



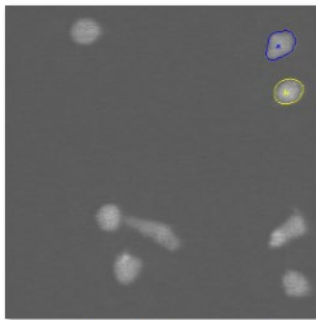
exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3418_ch02



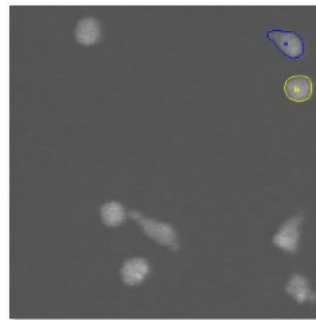
exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3419_ch02

The folder **TRACKED_GREEN_FL_CHANNEL** contains frames with the tracked and segmented cells represented in the green fluorescent channel:

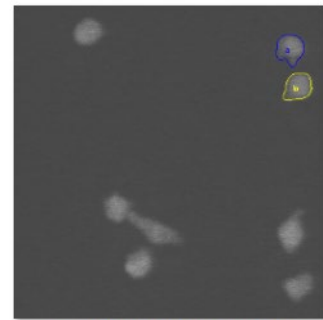
TEST > TRACKED_MOVIE_TEST > TRACKED_GREEN_FL_CHANNEL



exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3417_ch00



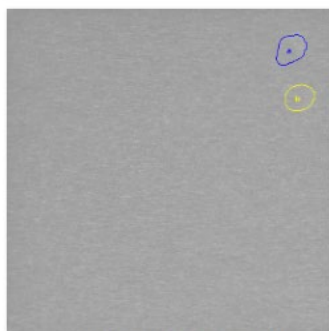
exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3418_ch00



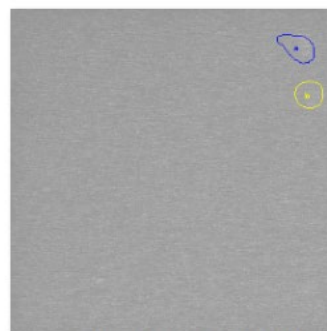
exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3419_ch00

The folder **TRACKED_RED_FL_CHANNEL** contains frames with the tracked and segmented cells represented in the red fluorescent channel:

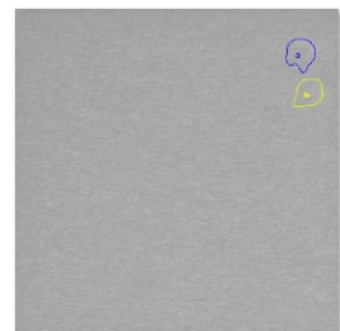
TEST > TRACKED_MOVIE_TEST > TRACKED_RED_FL_CHANNEL



exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3417_ch01

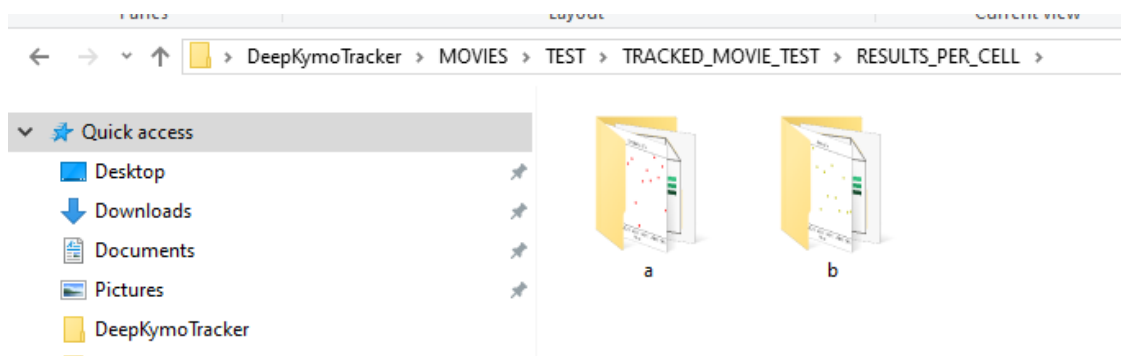


exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3418_ch01



exp_130705 UFGP OT1 DCS IL2 PE62L
microman_Pos0202_t3419_ch01

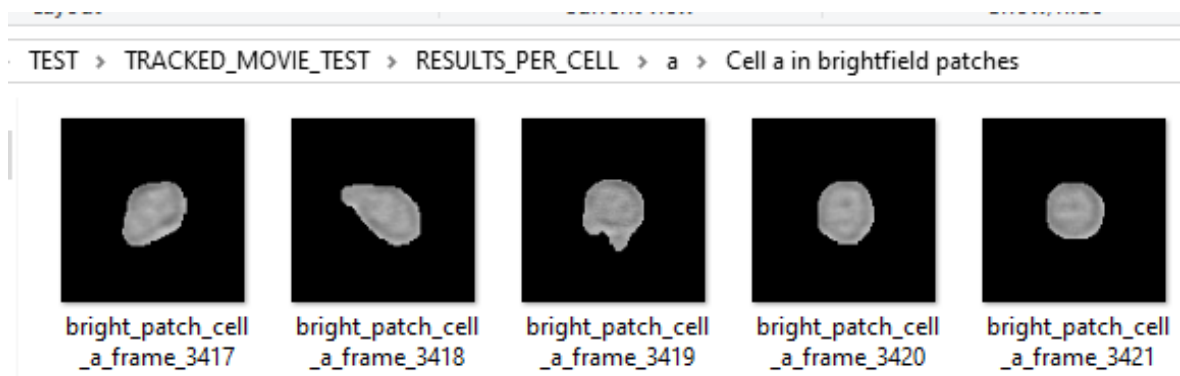
Let us walk through the contents of **RESULTS_PER_CELL** folder. As can be seen from the screenshot below, it contains a separate folder for each cell – in our case, these are folders named **a** and **b**, according to the cell names.



Let us take a look inside folder **a**. As you can see, it contains a number of folders and files:

TEST > TRACKED_MOVIE_TEST > RESULTS_PER_CELL > a >				
Name	Date modified	Type	Size	
Cell a in brightfield patches	9/5/2025 7:51 PM	File folder		
Cell a in green fluor patches	9/5/2025 7:51 PM	File folder		
Cell a in red fluor patches	9/5/2025 7:51 PM	File folder		
Cell a in segmented frames	9/5/2025 7:51 PM	File folder		
Cell a in segmented patches	9/5/2025 7:51 PM	File folder		
a	9/5/2025 7:51 PM	Microsoft Excel W...	34 KB	
Cell a areas diagram	9/5/2025 7:51 PM	PNG File	10 KB	
Cell a circularities diagram	9/5/2025 7:51 PM	PNG File	10 KB	
Cell a perimeters diagram	9/5/2025 7:51 PM	PNG File	10 KB	

Cell a in brightfield patches: these are patches with the cell (cell **a** in our example), where the body of the cell is taken from the brightfield channel and the background is black.



Cell a in green fluor patches: these are patches with the cell (cell **a** in our example), where the body of the cell is taken from the green fluorescent channel and the background is black.

TEST > TRACKED_MOVIE_TEST > RESULTS_PER_CELL > a > Cell a in green fluor patches



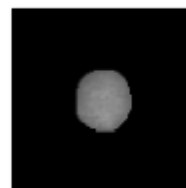
fluor_patch_cell_
a_frame_3417



fluor_patch_cell_
a_frame_3418



fluor_patch_cell_
a_frame_3419



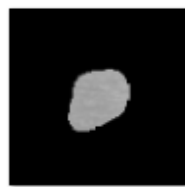
fluor_patch_cell_
a_frame_3420



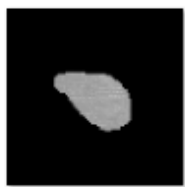
fluor_patch_cell_
a_frame_3421

Cell a in red fluor patches: these are patches with the cell (cell **a** in our example), where the body of the cell is taken from the red fluorescent channel and the background is black

TEST > TRACKED_MOVIE_TEST > RESULTS_PER_CELL > a > Cell a in red fluor patches



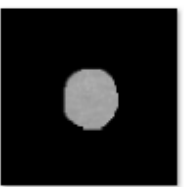
red_patch_cell_a_
frame_3417



red_patch_cell_a_
frame_3418



red_patch_cell_a_
frame_3419



red_patch_cell_a_
frame_3420



red_patch_cell_a_
frame_3421

Cell a in segmented frames: black frame where only segmented cell **a** is represented.

TEST > TRACKED_MOVIE_TEST > RESULTS_PER_CELL > a > Cell a in segmented frames



segm_frame_cell_a_frame_3417



segm_frame_cell_a_frame_3418



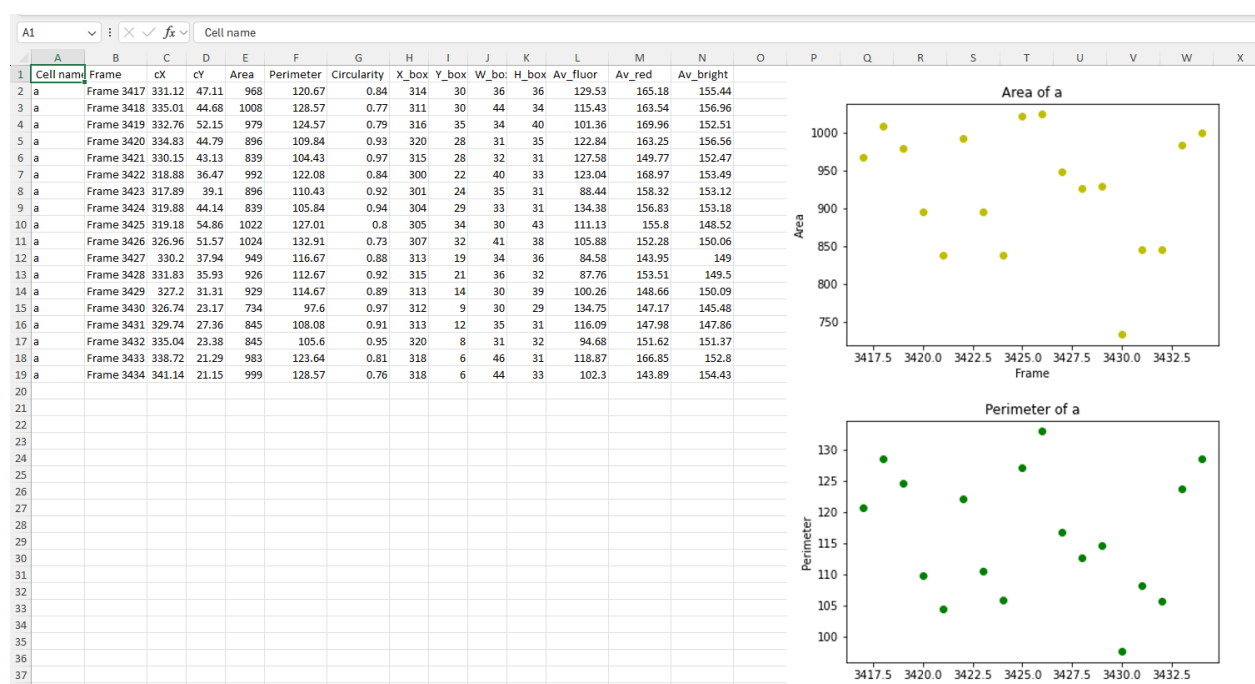
segm_frame_cell_a_frame_3419

Cell a in segmented patches: patches with segmented cell **a** in the centre.

segm_patch_cell_
a_frame_3417segm_patch_cell_
a_frame_3418segm_patch_cell_
a_frame_3419segm_patch_cell_
a_frame_3420segm_patch_cell_
a_frame_3421

a. .xlsx : this Excel file contains the numerical information about cell **a** in each frame:

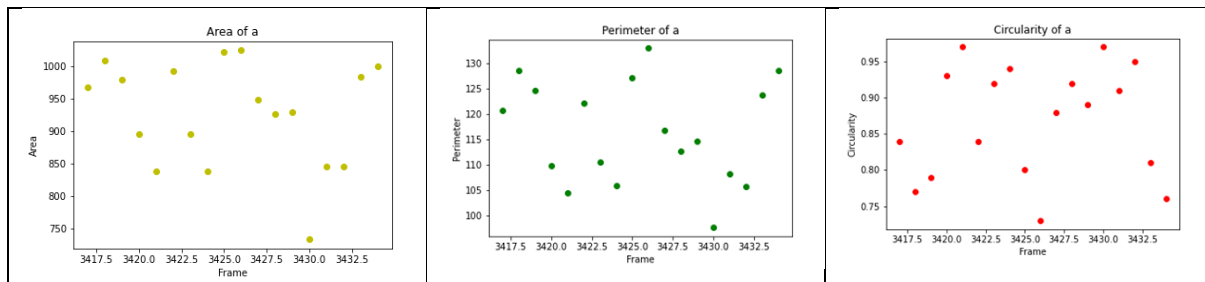
- **(cX, cY)** – coordinates of cell centroid;
- **(X_box, Y_box, W_box, H_box)**–the parameters of the bounding box for cell **a**, namely,
 X_box, Y_box are the coordinates of the top left corner of the bounding box,
 W_box, H_box – are the width and the height of the bounding box;
- **Av_fluor, Av_red, Av_bright** are the average intensities of the cell body in the green, red and brightfield channels, respectively.



The files **Cell a areas diagram.png**, **Cell a perimeters diagram.png** and

Cell a circularities diagram.png are the diagrams as shown below:

Cell a areas diagram:	Cell a perimeters diagram:	Cell a circularities diagram:
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Finally, if you for some reason prefer to extract the numerical information about each cell from .pkl file (rather than .xlsx), you can find **lineage_per_cell.pkl** file inside **HELPER_FOLDERS_(NOT FOR USER)**:

TEST > TRACKED_MOVIE_TEST > HELPER_FOLDERS_(NOT FOR USER) >				
Name	Date modified	Type	Size	
CLEANED_PATCHES	9/5/2025 6:57 PM	File folder		
IMAGES_FOR_FINAL_MOVIE	9/5/2025 6:57 PM	File folder		
LINEAGE_IMAGES	9/5/2025 6:57 PM	File folder		
MASKS	9/5/2025 6:57 PM	File folder		
VISUALISATION_HELPERS	9/5/2025 7:51 PM	File folder		
changeble_movie_parameters_history.pkl	9/5/2025 6:57 PM	PKL File	2 KB	
constant_movie_parameters.pkl	9/5/2025 6:55 PM	PKL File	4 KB	
lineage_per_cell.pkl	9/5/2025 7:51 PM	PKL File	1,109 KB	
lineage_per_frame.pkl	9/5/2025 7:51 PM	PKL File	48,421 KB	

In Python, you can extract the lineage_per_cell with the snippet of code below:

```

import pickle
outpath=r"C:\Users\helina\Desktop\DeepKymoTracker\MOVIES\TEST\TRACKED_MOVIE_TEST\HELPER_FOLDERS_(NOT FOR USER)"
pedigree_path=os.path.join(outpath,"lineage_per_cell.pkl")
with open(pedigree_path, 'rb') as handle:
    lineage_per_cell = pickle.load(handle)

```

Lineage_per_cell is a dictionary with cell names as the keys (in our example, there are “a” and “b”):

Lineage_per_cell={"a": [cell_a_params_for_frame_1, ... , cell_a_params_for_frame_k, ...],

"b": [cell_b_params_for_frame_1, ... ,cell_b_params_for_frame_k, ...]).

where

cell_a_params_for_frame_k=[cell_name, frame_number, patch_with_cell_in_colour, [cX,cY], area, perimeter, circularity, colour, bounding_box, av_fluor, av_red, av_bright].

Here

- bounding_box=X_box, Y_box, W_box, H_box
- colour=[r,g,b]
- patch_with_cell_in_color:

