

## SUPPLEMENTARY MATERIAL

corresponding to:

### ***In vivo* imaging of *Drosophila* wing heart development during pupal stages**

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**Supplementary movie M01:** Time-lapse movie illustrating the reshaping of the newly formed adult epidermis between 33 h to 52 h after puparium formation (APF) leading to the constriction between thorax and abdomen, the formation of the scutellum and the scutellar arm. Additionally, bristles grow out from large bristle cells. Between 45-50 h APF the surface of the scutellum is folded into two longitudinal and one transverse fold. From about 41 h APF brightly fluorescence cells are visible in the forming scutellar arms. The developing wing hearts are labeled by handC-DsRed (red channel) and all other cells including the epidermal cells by actin5C-Gal4>UAS-eGFP (green channel).

**Supplementary movie M02:** Time lapse movie illustrating the formation of the scutellum and the scutellar arms. UAS-eGFP, driven by act5C-Gal4, was used to label all cells of the scutellum and adjacent tissues (green channel). Wing heart cells are visualized using UAS-DsRed, driven by hand-Gal4 (red channel). The bottom section of the movie shows corresponding optical sections to illustrate tube formation within the scutellar arms.

**Supplementary movie M03:** Time-lapse movie showing the movement of wing heart precursor cells in relation to the engrailed expressing epidermal cells in thoracic segment T3 between 15 h to 31 h after puparium formation (APF). Wing heart cells are labeled by handC-DsRed (red channel). Engrailed expression is visualized by engrailed-Gal4>UAS-eGFP (green channel). Beside the epidermal engrailed expressing cells (stripe like expression) additional cells, likely macrophages, are labelled. The lower section of the movie shows the red channel (wing heart precursor movement) only.

**Supplementary movie M04:** Time lapse movie to illustrate wing heart and trachea development. Tracheal development was visualized by using UAS-eGFP, driven by breathless-Gal4 (green channel), and wing heart cells were visualized by handC-DsRed (red channel).

**Supplementary movie M05:** Time lapse movie to illustrate wing heart muscle and wing heart epithelium formation. This movie was used to assemble Figure 6. Wing heart cells were visualized by using UAS-mCD8::GFP driven by handC-Gal4.

**Supplementary movie M06:** Time lapse movie illustrating the movement of nuclei in the wing heart muscle cells. The nuclei are labeled by handC-GFP and the cytoplasm of wing heart cells by handC-DsRed. This movie covers 2 h of development (40 h APF - 42 h APF). Note that the nuclei move into both directions.

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