

## Drosophila Wing Imaginal Disc – Quantitative Data

Parameter	Value	Source (DOI or PMID)
Adhesion	E-cadherin	
Apical-basal polarity of Cadherin	Single layer organization	10.1038/nature01295
Apical cell area variation	Increasing from center to periphery	10.1242/dev.090878
Area dependence	Positively associated with G1-S transition probability	10.1073/pnas.1323016111
Apical cell surface area with rel. distance from center (pouch)	4-5 $\mu\text{m}^2$ (early), 4-6 $\mu\text{m}^2$ (mid 3 <sup>rd</sup> instar pouch), 3.2-5.8 $\mu\text{m}^2$ (late 3 <sup>rd</sup> instar)	10.1242/dev.082800
Apical wing disc area	90 $\mu\text{m}^2$ (1 <sup>st</sup> instar), 80,000 $\mu\text{m}^2$ (late 3 <sup>rd</sup> instar)	10.1371/journal.pone.0047594
Average growth rate of the wing disc	500 $\mu\text{m}^2/\text{h}$	10.1371/journal.pone.0047594
Average apical cell surface area	4.97 $\mu\text{m}^2$ (which dev. stage?)	10.1126/science.1200037
Cadherin-dependent cell-cell adhesion force	50-200 pN (how many adhesive junctions??), murine S180 cells	10.1242/jcs.151472
Cell density	Only minor increase during wing growth	10.1126/science.1200037
Cell division condition	50% increase of Dpp	10.1242/dev.105650
Cell division rate	Negatively associated with cell size, power law (4- to 5-fold).	10.1016/S0092-8674(00)81462-2
Cell elongation direction	In young discs almost random, whereas peripheral cells in later discs are preferentially elongated in the tangential direction wrt cell area gradient.	10.1242/dev.082800
Cell junction resting length	~ 0.03 $\mu\text{m}$	10.1002/jez.1402160107
Cell junction rate	Every 6-15 min	10.1016/j.devcel.2005.10.016
Cell number (wing disc)	30-50 – 50,000 (within 4-5d)	10.1016/j.semcd.2014.06.018,
Cell cycle time	Increases during development, ~8.5 hrs during exponential phase	
Cell number doubling time	To orders of magnitude increase (hours)	10.1242/dev.082800
Cellular rearrangements	moderate	10.1016/j.semcd.2014.06.018
Cell shape	40% pentagons, 40% hexagons, 20% heptagons	10.1016/j.devcel.2005.10.016
Compartments	Independent proliferation of pouch, hinge, notum.	10.4161/fly.4.3.11516
Compression	compression in the center of the disc correlates with disc size	
Cortical tension	Highest conc. Of actomyosin at the apical surface	
Cytome	Long range signaling proposed (Hh), very dynamic	10.1038/ncb2856
Death rate	Average 1.4% (early wing imaginal discs), single or average clusters of 3.4 cells	9159134
Dpp amplitude increase	Dpp source widening, decreasing degradation rate $k \sim 1/A$ . $C_0 \sim A(t)^\beta$ , $\beta=0.59$	10.1126/science.1200037
Dpp gradient	highest concentrations along the anteroposterior compartment boundary and lowest concentrations in the lateral regions	10.1242/dev.082800
Dpp gradient scaling	$\lambda/L = \text{constant}$ (decay length $\lambda$ , tissue width $L$ )	10.1126/science.1200037
Growth direction	Cell division parallel to direction of higher tension	10.1016/j.cell.2010.12.035
Growth feedback	Mechanical stress increases	10.1016/j.mod.2009.09.002
Growth rate	$g=(dA/dt)/A$ , homogeneous. Exponential phase followed by a decrease at the end of the growth phase (increasing cell doubling time $\theta \approx \ln 2/g$ due to lengthening of G2-phase)	10.1126/science.1200037 10.1242/dev.082800
Pouch shape	central oval (3 <sup>rd</sup> instar)	10.1016/j.semcd.2014.06.018
Spring constant of wing disc	5(1) N/m (considerably higher than the values for other embryonic tissues in the literature and lies more in the range of adult tissues or muscle)	10.1140/epje/i2010-10580-8
Stress distribution	Inhomogeneous, maximum compression in the centre of the wing pouch	10.1016/j.mod.2009.09.002
Stress-induced cell changes	Polarization of acto-myosin cortex,	10.1073/pnas.1323016111
Tissue final size	Less variable	
Tissue packing	Positively associated with distance from geometric center of wing pouch	
Tension at cell membrane	Positively associated with distance from geometric center of wing pouch	10.1242/dev.090878
Tissue elasticity	Young's modulus at order of $1\text{E}5$	9159134
Tissue surface tension	increases linearly with the expression level of adhesion molecules such as cadherins	10.1038/nrm2222
Wg gradient	perpendicular to the Dpp gradient with the highest concentrations at the dorsoventral compartment boundary	10.1242/dev.082800
Wing disc growth	1 <sup>st</sup> larval instar ~25 hrs (moderate, no division), 2 <sup>nd</sup> instar ~ 23 hrs (exponential), early 3 <sup>rd</sup> instar ~78 hrs (exponential)	10.1002/dvdy.24255