

Figure S1

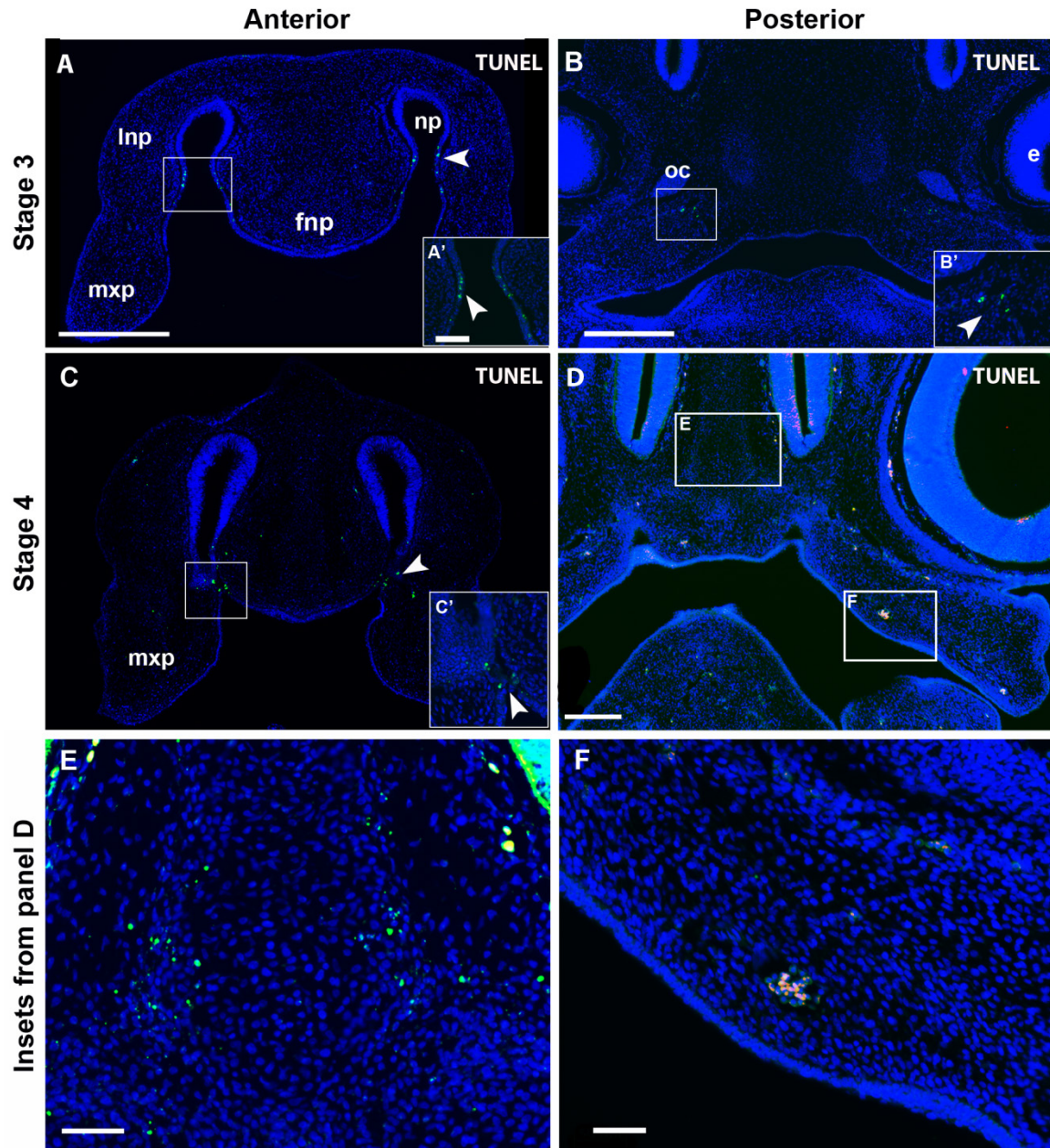


Figure S1 Apoptosis during *E. subglobosa* maxillary prominence development.

Fluorescence TUNEL reaction carried out using FITC labeled Dig-dUTP on transverse sections of turtle embryos. A, A') At stage 3, apoptotic cells are detected in the nasal pit epithelium (see inset). B, B') positive cells are present in the optic chiasma (inset). C, C') At stage 4, apoptotic cells are present in the fusion zone (inset). D) A posterior section just past the choanae. E) Apoptosis is observed in the nasal septal cartilage and perichondrium (F). No apoptotic cells were seen in the medial maxillary mesenchyme. Pink cells in F are blood cells which are autofluorescent. Key: e, eye; fnp, frontonasal prominence; Inp, lateral nasal prominence; np, nasal pit; mxp, maxillary prominence; mc, Meckel's cartilage. Scale bars = 400 μ m for low magnifications and 100 μ m for insets

Figure S2

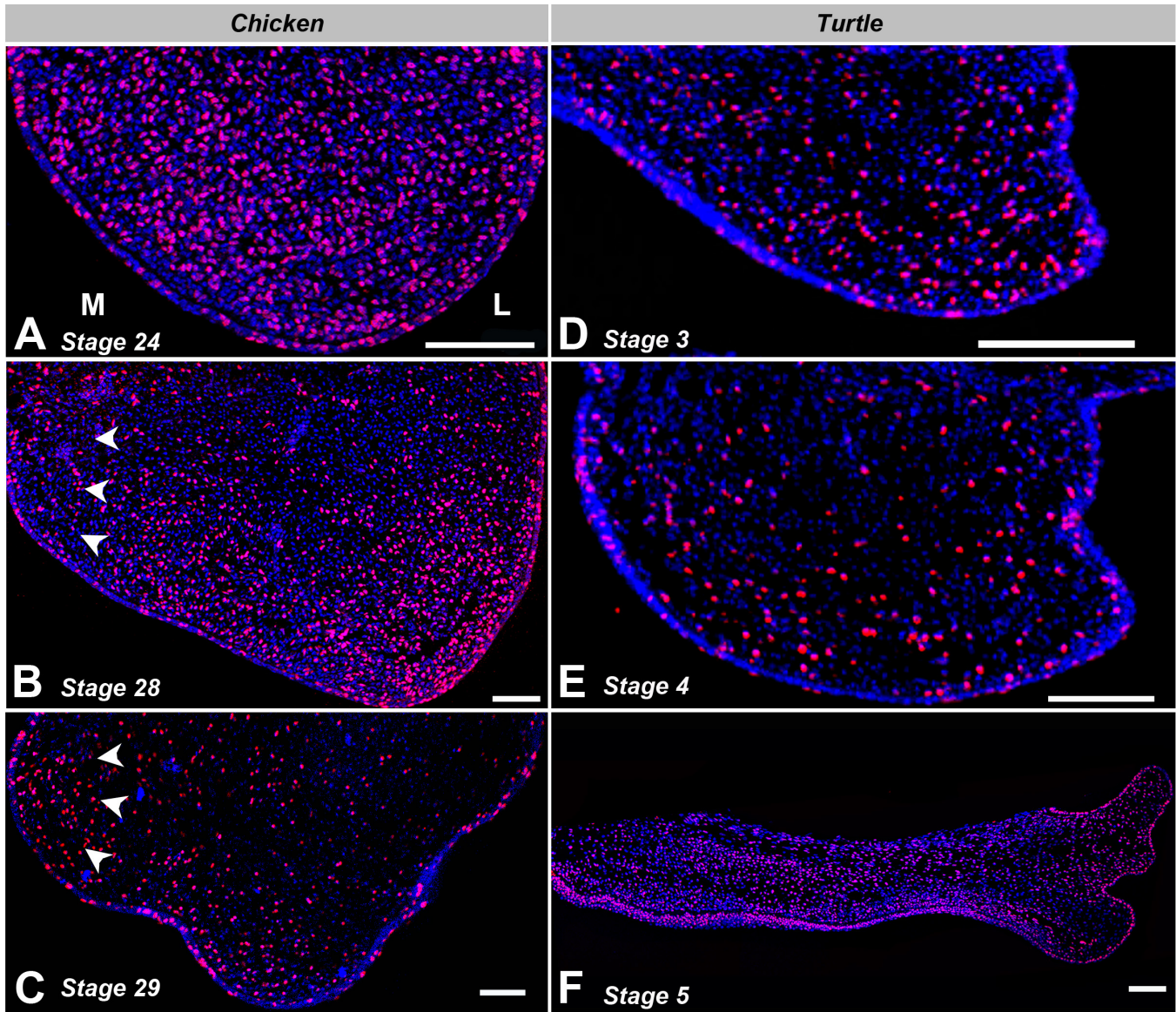


Figure S2. BrdU labeling patterns in developing maxillary prominences

Transverse sections stained with BrdU for proliferation cells and DAPI for nuclei. A) Proliferation patterns in maxillary prominence in chicken are relatively even at stage 24. B) Fewer cells are labeled in the cranial parts of the mesenchyme. C) Highest proliferation is seen medially. White arrowheads in panels B and C indicate regions of palatine process outgrowths. D) In turtle, proliferation is relatively even throughout the mesenchyme. E) Relatively fewer cells are labeled in the centre of the prominence F) The greatest growth has occurred in a medial axis. BrdU was used in panels A-E and PCNA in panel F. M, medial; L, lateral Scale bars = 100 μ m

Figure S3

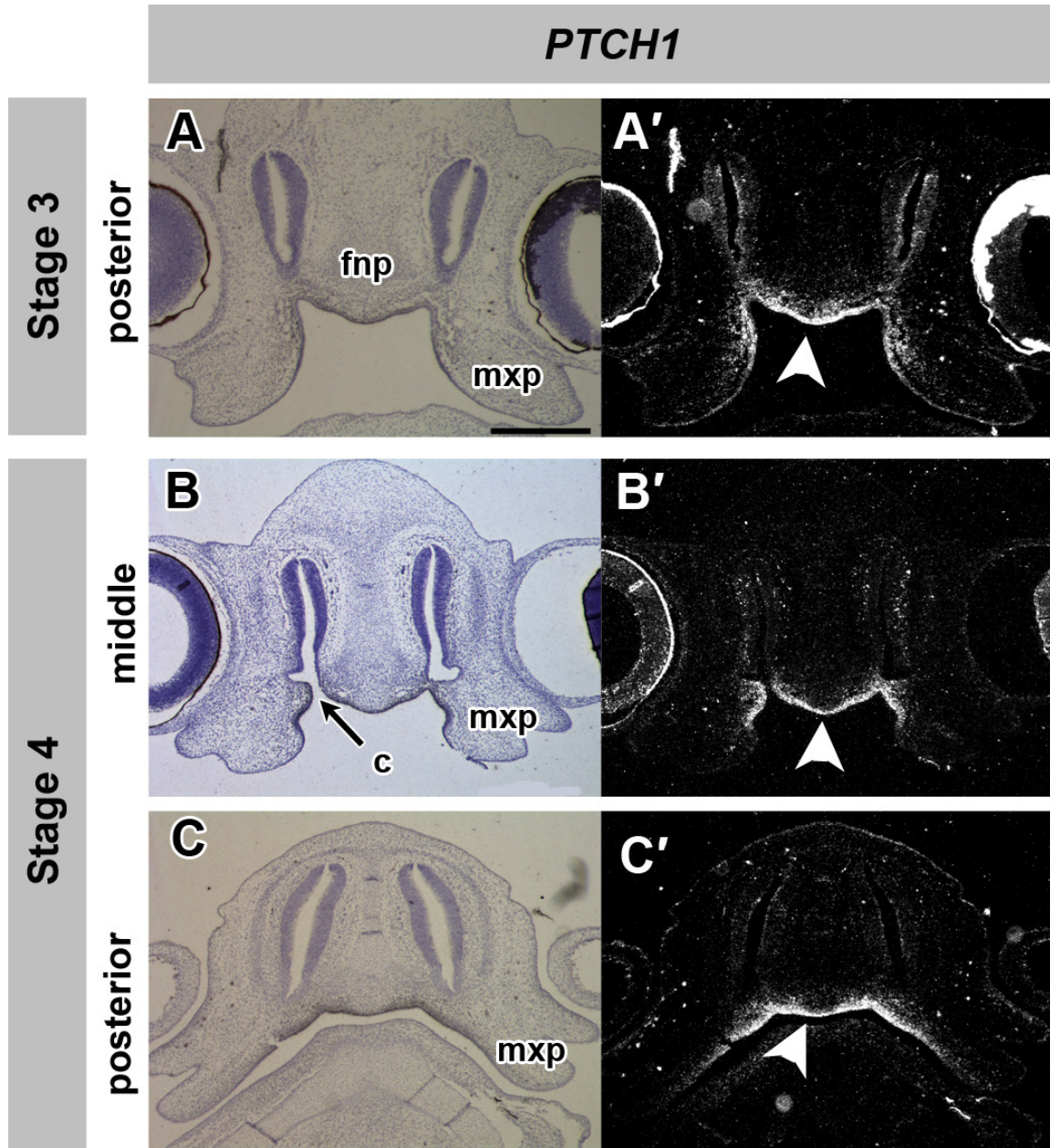


Figure S3 Expression of *PTCH1*

Radiolabeled antisense probe to *E. subglobosa PTCH1* was used to hybridize frontal sections of the head either posterior to the choana or through the choana (middle). The left column are brightfield views and the right hand column are darkfield views of the same sections. A) *PTCH1* expression is strongly restricted to epithelium and mesenchyme of the stomodeal roof at (A' arrowhead). B,C) At stage 4 expression persists in the stomodeal epithelium (arrowheads in B',C'). Key: fnp, frontonasal process; mxp, maxillary process. Scale bar = 500 μ m.

Figure S4

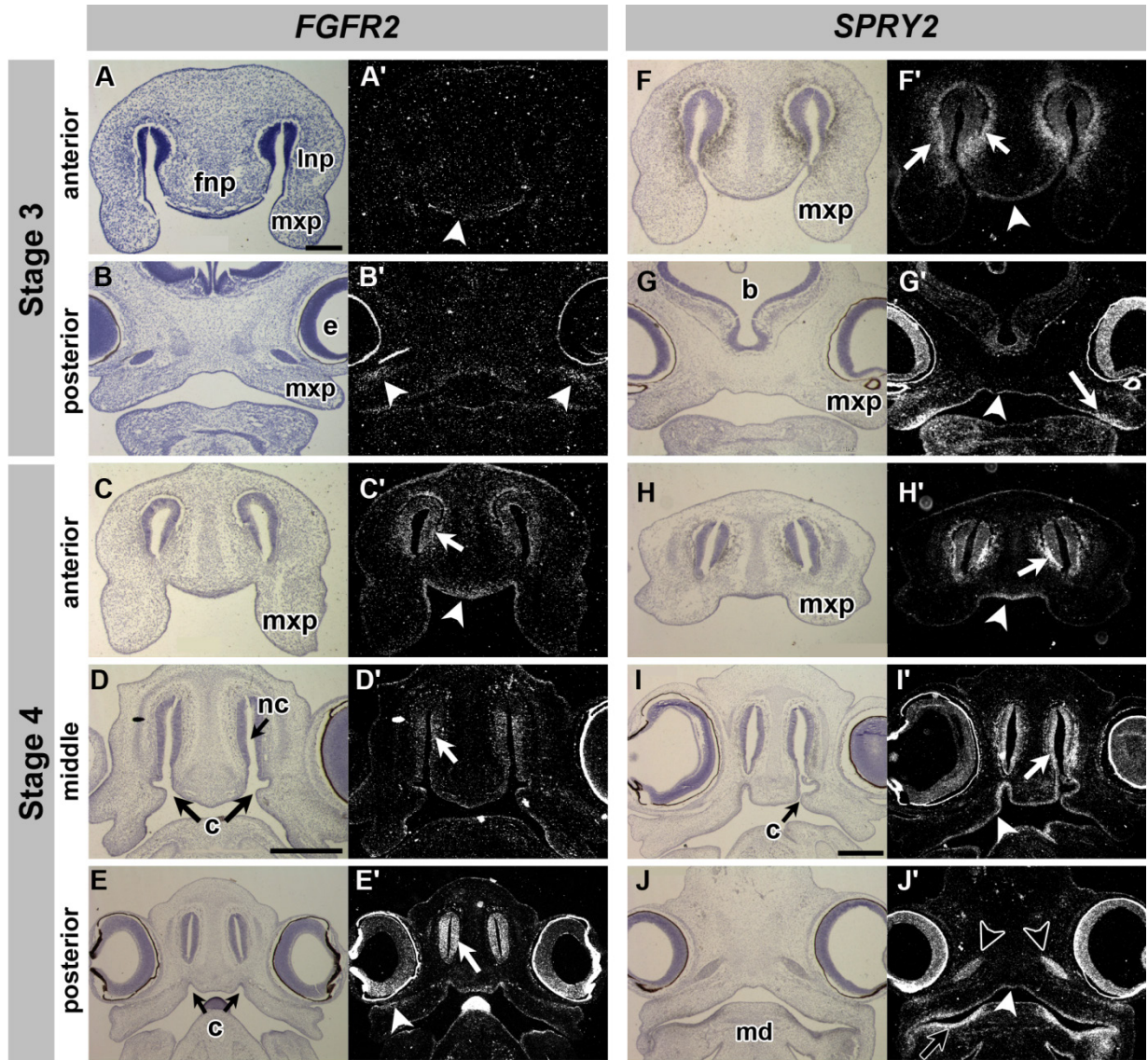


Figure S4 RNA expression of *FGF* pathway genes *FGFR2* and *SPRY2* in *E. subglobosa* embryos. Transverse sections through primary palate (anterior) and as well as middle and posterior of the choanae of *E. subglobosa* at stages 3 and stage 4. Columns 1 and 3 are bright field views of the same sections as in columns 2 and 4. A, A') *FGFR2* expression is weak, and limited to the oral epithelium of the frontonasal prominence. B, B') Mesenchymal expression is visible in the lateral maxillary prominence (white arrowheads). C, C') By stage 4 expression is present in the stomodeal roof (arrowhead). There is also strong expression in the epithelium and mesenchyme comprising the nasal passages (white arrow with tail). D, D') There is light expression in the olfactory epithelium (arrow with tail). E, E') Expression is highest in the nasal pit epithelium (arrow with tail). There is also a stripe of expression in the maxillary prominence (black arrowhead). F, F') There is strong expression surrounding the nasal pits in both the frontonasal and lateral nasal prominences (white arrows with tails). G, G') In posterior sections, expression is present in the caudal maxillary mesenchyme (arrow with tail) and stomodeal ectoderm (arrowhead). H, H') Similar facial expression of *SPRY2* is observed surrounding the nasal passages (arrow with tail) and in the stomodeum (arrowhead). I, I') Expression continues to be present in the nasal passage mesenchyme (arrows with tails) and choana epithelium (arrowhead). J, J') Strong expression in the olfactory nerve (black arrowheads), stomodeal epithelium (white arrowhead), cranial mandibular mesenchyme (black arrow with tail). Key: c, choanae; fnp, frontonasal prominence; lnp, lateral nasal prominence; md, mandibular prominence; mxp, maxillary prominence; nc, nasal cavity. Scale bars: A (200 μ m) applies to A', B, B', F, F', G, and G'. Scale bar in D (500 μ m) applies to D, D', E, E', H, H'. Scale bar in I (500 μ m) applies to I, I', J, and J'.

Table S1. Statistical analysis using Analysis of Variance (ANOVA) followed by Tukey's Post hoc testing on percent labeled cells/total cell number on chicken maxillary prominences

Stage 24	Region 1 Avg- 55 STDV-8.8	Region 2 Avg- 55.9 STDV-5.7	Region 3 Avg-62.3 STDV-7.6	Region 4 Avg- 69.7 STDV-4.6	Region 5 Avg- 61.9 STDV-8.5	Region 6 Avg- 72.9 STDV-11.4
Region 1		0.999954	0.627916	0.038065	0.681742	0.007210
Region 2	0.999954		0.748156	0.060037	0.795863	0.011992
Region 3	0.627916	0.748156		0.606145	0.999999	0.235378
Region 4	0.038065	0.060037	0.606145		0.551412	0.983197
Region 5	0.681742	0.795863	0.999999	0.551412		0.201607
Region 6	0.007210	0.011992	0.235378	0.983197	0.201607	

Stage 28	Region 1 Avg- 24.5 STDV-5	Region 2 Avg- 22 STDV-7	Region 3 Avg- 27 STDV-6	Region 4 Avg- 48.5 STDV-6.3	Region 5 Avg- 45.2 STDV-6.5	Region 6 Avg- 48.6 STDV-6.1
Region 1		0.989477	0.981372	0.000187	0.000476	0.000174
Region 2	0.989477		0.783260	0.000147	0.000205	0.000144
Region 3	0.981372	0.783260		0.000452	0.002103	0.000370
Region 4	0.000187	0.000147	0.000452		0.977801	0.999996
Region 5	0.000476	0.000205	0.002103	0.977801		0.957330
Region 6	0.000174	0.000144	0.000370	0.999996	0.957330	

Stage 29	Region 1 Avg- 35.5 STDV-2.6	Region 2 Avg- 31 STDV-3.7	Region 3 Avg- 27.8 STDV-2.4	Region 4 Avg- 24.6 STDV-2.9	Region 5 Avg- 23.2 STDV-.64	Region 6 Avg- 19.8 STDV-.6
Region 1		0.273683	0.022258	0.001677	0.000676	0.000198
Region 2	0.273683		0.635133	0.067783	0.021826	0.001418
Region 3	0.022258	0.635133		0.605125	0.269259	0.016758
Region 4	0.001677	0.067783	0.605125		0.981531	0.231805
Region 5	0.000676	0.021826	0.269259	0.981531		0.545184
Region 6	0.000198	0.001418	0.016758	0.231805	0.545184	

Table S2. Statistical analysis using Analysis of Variance (ANOVA), followed by Tukey's Post hoc testing on percent labeled cells/total cell number for turtle maxillary prominences

Stage 3	Region 1 Avg- 28.2 STDV-8.9	Region 2 Avg- 26.7 STDV-11	Region 3 Avg- 40.1 STDV-10.1	Region 4 Avg- 53.8 STDV-12.3	Region 5 Avg- 42.2 STDV-7.5	Region 6 Avg- 43.7 STDV-7.3
Region 1		0.999957	0.684452	0.068188	0.538772	0.433111
Region 2	0.999957		0.575885	0.049756	0.435687	0.341510
Region 3	0.684452	0.575885		0.557716	0.999817	0.997132
Region 4	0.068188	0.049756	0.557716		0.703255	0.806078
Region 5	0.538772	0.435687	0.999817	0.703255		0.999952
Region 6	0.433111	0.341510	0.997132	0.806078	0.999952	

Stage 4	Region 1 Avg- 30.9 STDV-9	Region 2 Avg- 13.9 STDV-6.8	Region 3 Avg- 28.77 STDV-6.1	Region 4 Avg- 47.56 STDV-9.2	Region 5 Avg- 28.4 STDV-7.9	Region 6 Avg- 33.65 STDV-3.1
Region 1		0.100680	0.998899	0.112321	1.000000	0.898843
Region 2	0.100680		0.179798	0.001038	0.102653	0.018049
Region 3	0.998899	0.179798		0.061448	0.999060	0.727144
Region 4	0.112321	0.001038	0.061448		0.110178	0.480126
Region 5	1.000000	0.102653	0.999060	0.110178		0.894509
Region 6	0.898843	0.018049	0.727144	0.480126	0.894509	

Stage 5	Region 1 Avg- 60.6 STDV-4.2	Region 2 Avg- 66.1 STDV-8.9	Region 3 Avg- 74.8 STDV- .91	Region 4 Avg- 79.5 STDV- 2.4	Region 5 Avg- 91.8 STDV-3.8	Region 6 Avg- 72.3 STDV-8.3
Region 1		0.826969	0.074220	0.013206	0.000329	0.179224
Region 2	0.826969		0.437076	0.098642	0.001272	0.746330
Region 3	0.074220	0.437076		0.898940	0.026717	0.992387
Region 4	0.013206	0.098642	0.898940		0.145668	0.622815
Region 5	0.000329	0.001272	0.026717	0.145668		0.010551
Region 6	0.179224	0.746330	0.992387	0.622815	0.010551	