# Squamous Cell Carcinoma (SCC) Across Species:
## Preliminary Findings from a multi-institutional survey of SCC in birds

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## Background

- **First large scale multi-institutional survey to collect treatment and outcome data on avian SCC**
- **Results to support evidence-based clinical guidelines for the treatment of SCC in avian species and provide comparative medical understanding of SCC**
- **Preliminary results indicate important similarities across species**

### In Avian Species

- Second most common type of tumor found in Order Galliform and Order Psittaciformes[3]
- Common lesion locations: skin, oral cavity, choana, beak, uropygial gland
- Most common type of neoplasm in cockatiel, budgerigar, African grey and rosella, Guinea fowl, and chicken



### In Humans

- Second most common type of skin cancer and accounts for nearly 20% of cutaneous malignancies[2]
- Common lesion locations: skin, head and neck, esophagus, lungs, prostate, bladder, cervix
- Cutaneous lesions more common in people with fair skin, certain genetic conditions or an impaired immune system


www.mja.com.au/journal/2009/190/5

http://en.wikipedia.org/wiki/Squamous-cell_carcinoma

http://www.cancerjournal.net/text.asp?2010/6/3/370/73364

### Similarities between Human & Avian SCC

**Common Risk Factors/Concurrent Disease:** Hypovitaminosis A, chronic infection or inflammation
**Similar Lesion Locations:** Dermis, head and neck
**Similar Treatments:** Surgical excision, cryosurgery, laser surgery, radiation therapy, photodynamic therapy, chemotherapy, topical medications, debulking (common in avians with hard to resect tumors)

### Differences between Human & Avian SCC

**Mortality:** high in avians vs. low in humans
**Metastasis**
- Avian: rare, tumors extremely locally invasive
- Human: tumors >2cm more likely to metastasize

**Diagnostic Tools:** biopsy common to both
- Avian: fine needle aspirate (FNA), radiograph
- Human: CT, MRI

### Assessing the Avian Model

- Spontaneous avian SCC is a potential model to study safety and efficacy of therapies prior to mammalian / human clinical trials.
- Rapid cancer progression in avians shortens duration to clinically significant findings.

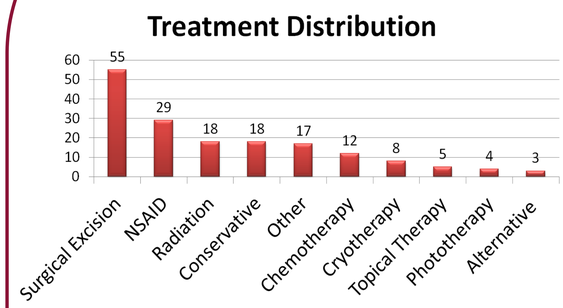
*To better assess the effectiveness of avian models:*
- compare avian/human tumor genome for mutational landscape and identify altered signaling pathways affected
- comparison of known biomarkers in human SCC (ex: COX-2 expression)

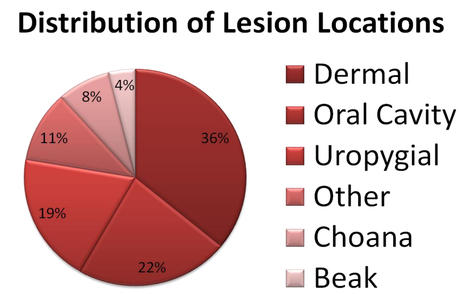
### SCC Studies for Potential Avian Trials

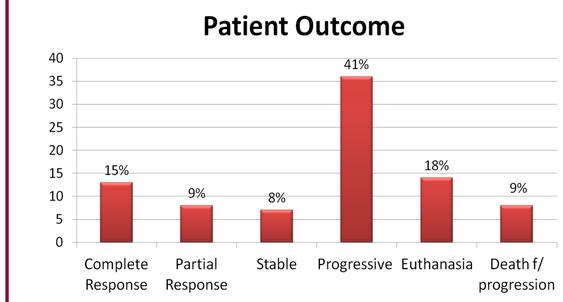
- Antiproliferative effects of citrus flavonoids on human SCC *in vitro*[4]
- Vitamin D receptor agonist / histone deacetylase inhibitor molecular hybrids[5]
- Antiproliferative effects of tyrosine kinase inhibitor tyrphostins on human SCC *in vitro* and in nude mice[6]
- Differential induction of apoptosis by all trans-retinoic acid retinamides in head and neck human SCC cell lines[7]

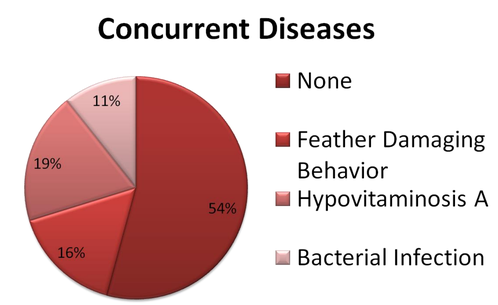
## REDcap survey[1]: Preliminary Results

**Sample Size: n=131**




### Unadjusted Odds Ratio and 95% Confidence Interval for Partial or Complete Response

| | Odds Ratio | 95% Confidence Interval |
|---|---|---|
| **Lesion Location*** | | |
| Uropygial | 2.4 | (0.7-7.9) |
| Dermal | 1 | |
| **Concurrent Disease** | | |
| Feather Damaging Behavior | 1.1 | (0.3-4.5) |
| Hypovitaminosis A | 2 | (0.5-8.2) |
| Bacterial Infection | 1.7 | (0.4-7.4) |
| **Treatment** | | |
| Surgery | 14.3 ** | (1.7-118) |
| Other than Surgery | 1 | |

*Analysis sample is subset with lesion locations amenable to surgery
**Statistically significant

## References

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