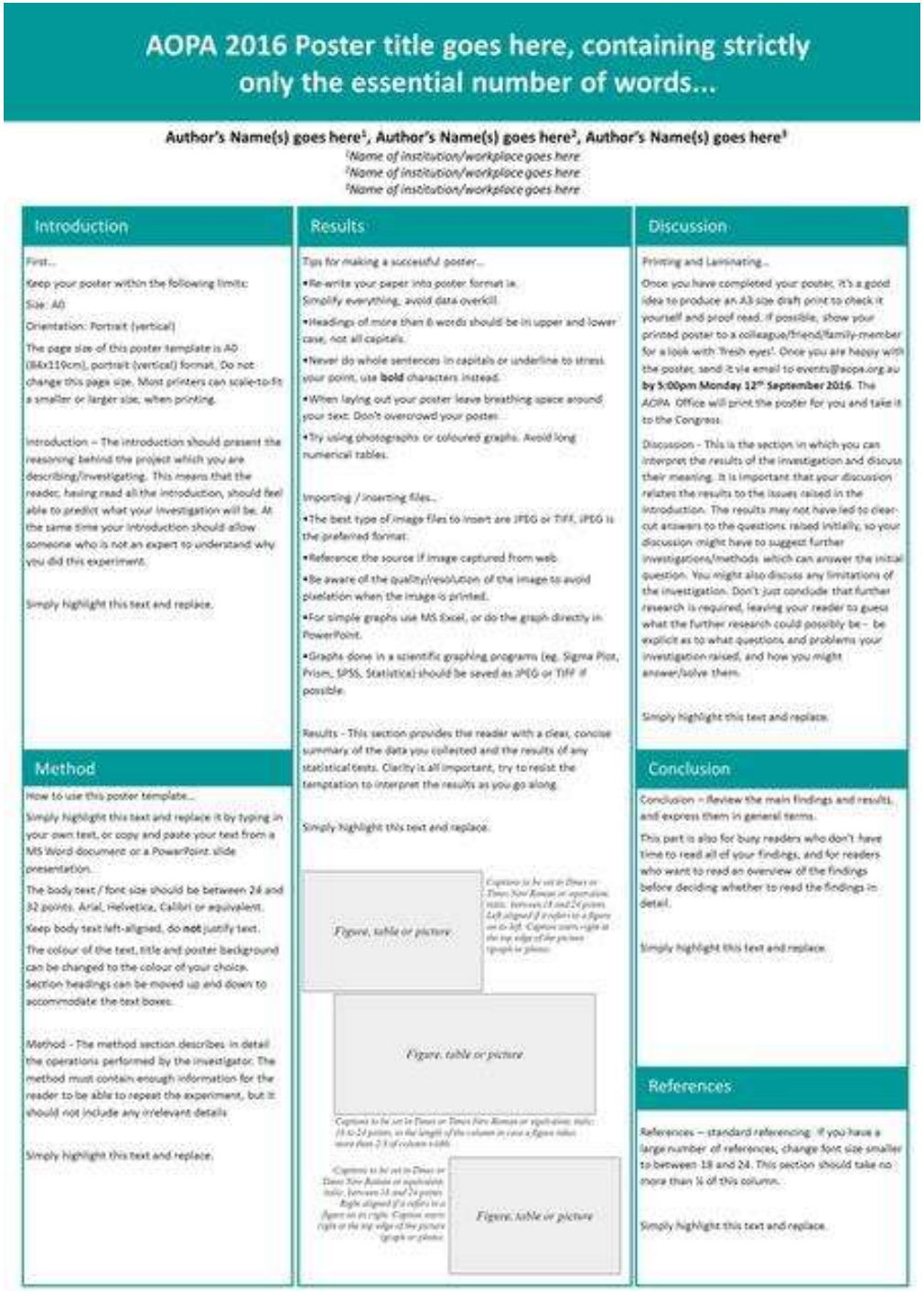
Visual presentation

- Colour scheme: visually appealing
  - Use colour and fonts to achieve a consistent and clean layout.
- Images: large enough; easy to understand; include legends
- Blocks of text: don’t overcrowd; avoid bullet points; use full sentences
- Word count: ~800-1000 words; clear and to the point (800 words minimum -10%; 1000 words maximum +10%)
- Use of numbering, and headlines to make it easy to read.

Simple layout

- Layout easy to follow
- Text :
  - Maybe a little too small?
  - Maybe a little too much?
- Slightly boring, but does the job



AOPA 2016 Poster title goes here, containing strictly only the essential number of words...

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Introduction

First...

Keep your poster within the following limits:

Size: A0

Orientation: Portrait (vertical)

The page size of this poster template is A0 (84x119cm), portrait (vertical) format. Do not change this page size. Most printers can scale-to-fit a smaller or larger size, when printing.

Introduction – The introduction should present the reasoning behind the project which you are describing/investigating. This means that the reader, having read all the introduction, should feel able to predict what your investigation will be. At the same time your introduction should allow someone who is not an expert to understand why you did this experiment.

Simply highlight this text and replace.

Method

How to use this poster template...

Simply highlight this text and replace it by typing in your own text, or copy and paste your text from a MS Word document or a PowerPoint slide presentation.

The body text / font size should be between 24 and 32 points. Arial, Helvetica, Calibri or equivalent.

Keep body text left-aligned, do **not** justify text.

The colour of the text, title and poster background can be changed to the colour of your choice. Section headings can be moved up and down to accommodate the text boxes.

Method - The method section describes in detail the operations performed by the investigator. The method must contain enough information for the reader to be able to repeat the experiment, but it should not include any irrelevant details

Simply highlight this text and replace.

Results

Tips for making a successful poster...

•Re-write your paper into poster format ie. Simplify everything, avoid data overkill.

•Headings of more than 6 words should be in upper and lower case, not all capitals.

•Never do whole sentences in capitals or underline to stress your point, use **bold** characters instead.

•When laying out your poster leave breathing space around your text. Don't overcrowd your poster.

•Try using photographs or coloured graphs. Avoid long numerical tables.

Importing / inserting files...

•The best type of image files to insert are JPEG or TIFF, JPEG is the preferred format.

•Reference the source if image captured from web.

•Be aware of the quality/resolution of the image to avoid pixelation when the image is printed.

•For simple graphs use MS Excel, or do the graph directly in PowerPoint.

•Graphs done in a scientific graphing programs (eg. Sigma Plot, Prism, SPSS, Statistica) should be saved as JPEG or TIFF if possible.

Results - This section provides the reader with a clear, concise summary of the data you collected and the results of any statistical tests. Clarity is all important, try to resist the temptation to interpret the results as you go along.

Simply highlight this text and replace.

Figure, table or picture

Figure, table or picture

Figure, table or picture

Discussion

Printing and Laminating...

Once you have completed your poster, it's a good idea to produce an A3 size draft print to check it yourself and proof read. If possible, show your printed poster to a colleague/friend/family-member for a look with 'fresh eyes'. Once you are happy with the poster, send it via email to events@aopa.org.au **by 5:00pm Monday 12th September 2016**. The AOPA Office will print the poster for you and take it to the Congress.

Discussion - This is the section in which you can interpret the results of the investigation and discuss their meaning. It is important that your discussion relates the results to the issues raised in the introduction. The results may not have led to clear-cut answers to the questions raised initially, so your discussion might have to suggest further investigations/methods which can answer the initial question. You might also discuss any limitations of the investigation. Don't just conclude that further research is required, leaving your reader to guess what the further research could possibly be – be explicit as to what questions and problems your investigation raised, and how you might answer/solve them.

Simply highlight this text and replace.

Conclusion

Conclusion – Review the main findings and results, and express them in general terms.

This part is also for busy readers who don't have time to read all of your findings, and for readers who want to read an overview of the findings before deciding whether to read the findings in detail.

Simply highlight this text and replace.

References

References – standard referencing. If you have a large number of references, change font size smaller to between 18 and 24. This section should take no more than ¼ of this column.

Simply highlight this text and replace.

Nice poster

PERSONALITY, SEX DIFFERENCES, AND MATE CHOICE IN THE EUROPEAN SERIN

Ana V. Leitão* & Paulo G. Mota

CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, Universidade de Coimbra, Departamento Ciências da Vida, Laboratório de Etologia, Coimbra, Portugal
*Corresponding Author: anamvleitao@gmail.com

INTRODUCTION

- Animals can demonstrate individual behavioural traits that are consistent over time and in different contexts, also known as personality traits (Réale et al. *Philosophical Transactions B.* 2010).
- Personality has increasingly been the focus of ecological studies to understand the evolution and maintenance of these and its consequences.
- While several hypothesis have been considered, sexual selection has been scarcely studied although it is possible that it may play an important role in the origin and maintenance of personality differences (Schuett et al. *Bio Reviews* 2010).

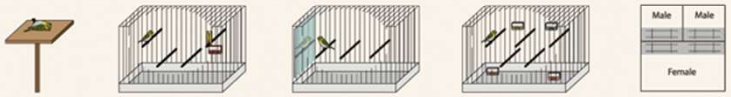
OBJECTIVES

- Study consistent interindividual differences in behaviour in the serin (*Serinus serinus*).
- Understand how sexes differ in their behavioural traits.
- Understand how different behavioural contexts are related and differ between sexes.
- Explore a possible role of personality traits in female mate choice.

METHODS

- Wild serins (30 males and 17 females) were captured, and maintained in an indoor aviary until the end of the experiments.
- Individuals were subjected to four behavioural tests to assess fear **(a)**, neophobia **(b)**, sociability **(c)**, and exploration **(d)**, and tested for repeatable individual differences in two rounds.
- Mate choice tests were performed in an aviary **(e)** with a random female and a unique combination of two males with similar colouration.

(a) Tonic immobility test | **(b)** New Object test | **(c)** Mirror test | **(d)** Cage exploration test | **(e)** Mate choice



RESULTS

REPEATABILITY
Males and females differ in their consistency

Trait		Repeatability
Fear	All	R=0.353 P<0.001
	Males	R=0.367 P=0.023
	Females	R=0.353 P=0.082
Neophobia	All	R=0.580 P<0.002
	Males	R=0.350 P=0.025
	Females	R=0.630 P=0.002
Sociability	All	R=0.293 P=0.080
	Males	R=0.267 P=0.072
	Females	R=0.025 P=0.459
Exploration	All	R=0.240 P=0.049
	Males	R=0.350 P=0.026
	Females	R=0.073 P=0.380

Table 1. Repeatability calculated from variance components of ANOVA for the 4 personality traits. Sample size: Total: 46, Males: 30, Females: 17

SEX DIFFERENCES
Males are more sociable than females ($t = -2.017$, $P = 0.050$)

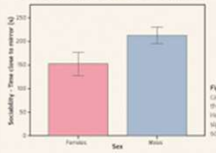


Figure 1. Sex differences calculated with t test, for the 4 personality traits. Here we present the only significant difference, for sociability.

MATE CHOICE
Female number of visits to males was related to their own personality trait (sociability: $X^2 = 10.455$, $p = 0.001$)

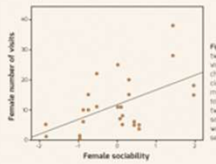


Figure 2. Relationship between female number of visits to males in the mate choice test and female sociability. A GLM repeated measures was performed to test female visits using two PCA's of female personality as covariates. PC2 was significant and represents female sociability.

RELATIONSHIP ACROSS BEHAVIOURAL TRAITS
Females and Males differ in their behavioural syndrome

CONCLUSIONS

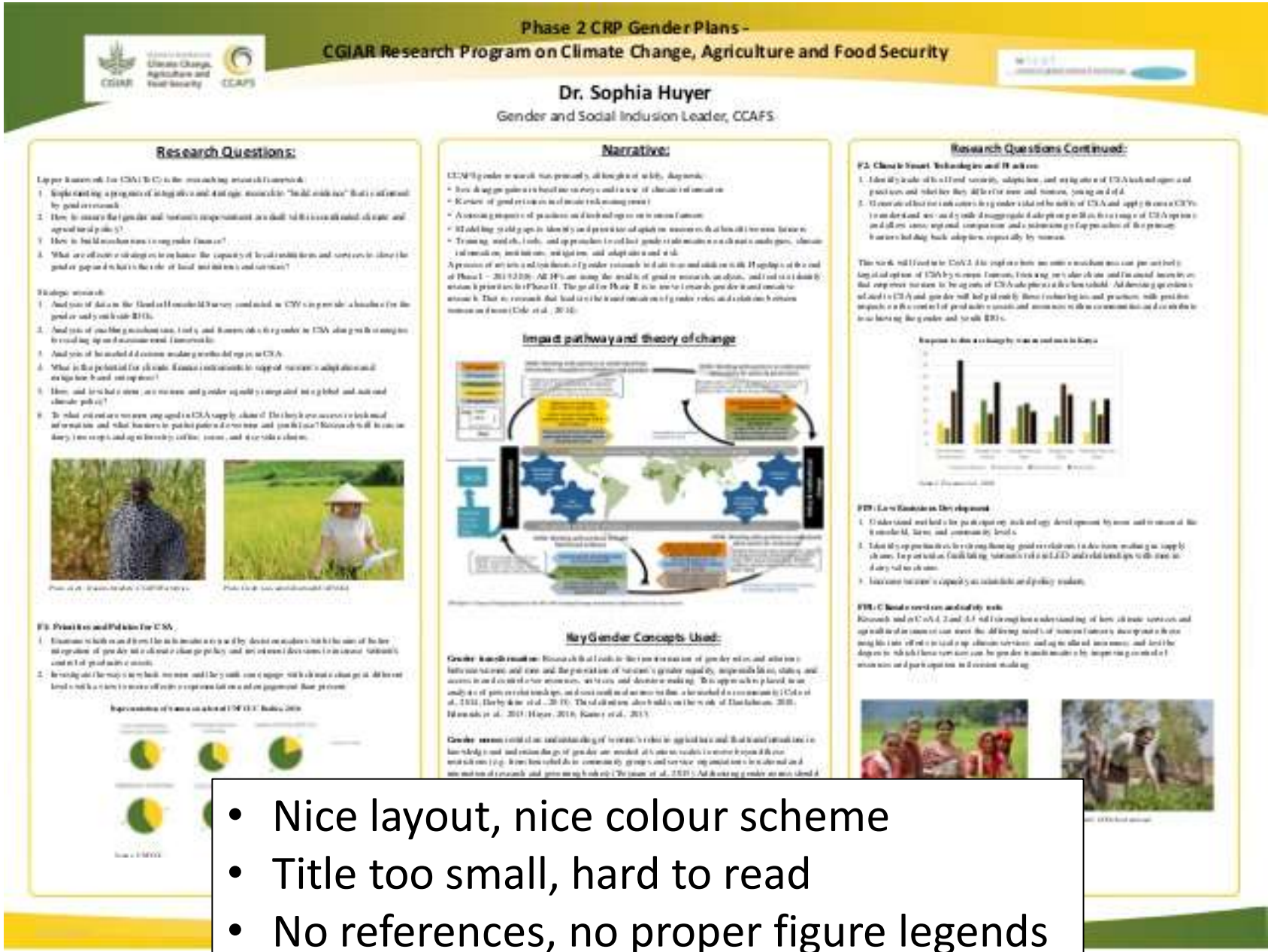
- Individuals showed repeatability in the four behavioural tests.
- Males and females differed in their consistency and behavioural responses across the different tests.
- Behavioural traits were correlated, indicative of a possible behavioural syndrome, but differed between females and males: More neophobic males were also more sociable, and females that were more sociable were less fearful and marginally less explorative.
- In mate choice tests, female personality was related with its own behavioural performance.
- Our results stress the importance of looking for sex differences in personality, and for considering the influence of personality in mate choice context.

Acknowledgements:
We thank everyone of the Behavioural Ecology Group for the support. This work is funded by FCT, Portugal, Project SFRH/BD/44837/2008. We held the necessary Portuguese licenses for conducting this work.

Replace this with Discussion and conclusions

Replace this with References

What's wrong with this poster?



- Nice layout, nice colour scheme
- Title too small, hard to read
- No references, no proper figure legends

What's wrong with this poster?

- Confusing layout, hard to follow
- Text hard to see:
  - blue text on blue background
  - font too small
  - white text overlapping images
- Images too small
- No references

Seasonal, sex, and age specific variations in immune gene expression profiles underlie cancer progression in Tasmanian devils (*Sarcophilus harrisii*)

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2 School of Natural Sciences, University of Tasmania, Private Bag 55, Hobart, Tasmania 7001, Australia.
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Background

Tasmanian devil facial tumour disease (DFTD) has reduced devil populations by >85% in the last 20 years. Research has recently discovered devils are showing signs of adaptation to DFTD[1], including changes in allele frequency in cancer related genes[2], surviving longer once infected with DFTD[3] and even regression and clearing of DFTD[4], all indicating the importance of the devil immune system in fighting the disease.

However, factors other than disease also affect immune function, and thus can concomitantly impact DFTD progression and outcomes. Such factors are:

- Seasonal variation: altered immune function and switching between adaptive and innate immune responses across seasons[5]
- Changes with age: immunosenescence[6]
- Sex differences in immune function and strategies: females tend to mount and maintain stronger immune responses[7]
- Impact of co-infection with multiple parasites[8]
- Variation in response to overall health and body condition[9]

Tasmanian devils show sex specific differences in response to DFTD[10], suffer from immunosenescence[11], are regularly infected with parasites[12] and show seasonal hormonal variation connected with reproduction[13].

Aim: Investigate the factors influencing the Tasmanian devil immune system and consequently, DFTD susceptibility and progression

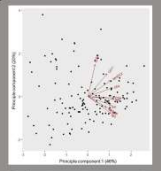
Methods

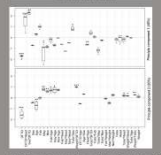
Samples
140 Tasmanian devil blood samples collected seasonally from West Pencil Pine forest. Devils aged between <1 - 5yrs, 40 animals with DFTD, 84 females, 53 males.

Genes: 3 innate immune genes (CD11, CD16, NKG2D), 7 adaptive immune genes (IgG, IgM, IgE, IgA, CD4, CD8, MHCC2).
Factors: Sex, Season, DFTD infection, Age, Ticks, Head width and Weight.
Interaction between head width and weight as proxy for body condition.
Correlations between variables measured and taken into account when interpreting results.
Gene expression: via RT-qPCR, Normalization using Pfaffl

Statistical analysis in R
Principal component analysis (ggbiplot)
Linear mixed models (lme4)
Model analysis (glmulti)
Factors normalized and scaled for comparisons

Results





Principal component analyses of 10 genes

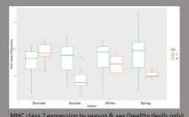
- Strongly correlated genes:
  - IgA & CD8
  - IgM & IgG & NKG2D
- Together, PC1 and PC2 account for 66% of variation in dataset

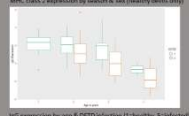
Key findings of Multi-model analysis model estimates for PC1 and PC2 models in top 2 AIC

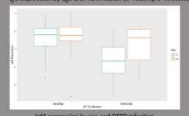
PC1
- DFTD infection and season in all top 20,000 models
- Strongest effects with DFTD, DFTD*Head and DFTD*Sex, all statistically significant

PC2
- Age and DFTD present in all top 20,000 models.
- Strongest effects for DFTD infection, highly significant

Multi-model analysis model estimates for PC1 and PC2 models in top 2 AIC *(above)*
All continuous predictor variables scaled to allow comparison of size of effect, measured as a distance from 0.
* Some models – p-value <0.05 ** All models – p-value <0.05 *** All models – p-value <0.005


MHC class 2 expression by season & sex (healthy devils only)


IgG expression by age & DFTD infection (1=healthy, 2=infected)


IgM expression by sex and DFTD infection

Gene snapshots
Female devil MHC class 2 immune gene expression is stable throughout the year, while male expression fluctuates, highest in summer, lowest in autumn

Devils display immunosenescence, with IgG expression lower when infected with DFTD

Sick female devils display lower IgM gene expression than either healthy females or males

Discussion

This study has shown strong correlation between the expression of several immune genes in Tasmanian devils, a result not surprising as many immune genes share common pathways.
The expression of the immune genes was affected by DFTD infection, season and age.
In general, female immune function is stable throughout the year, while male immune function fluctuates in relation to the breeding season. The collapse of the male immune system following the breeding season (when involved in fighting and mate guarding) might make males more susceptible to DFTD infection. The stable immune function of females throughout the year, potentially provides better protection against DFTD. This could explain higher male susceptibility to DFTD, the lack of males surviving to older age and why most of the DFTD regressions have been discovered in females.
Immunosenescence was confirmed in devils, also showing that DFTD accelerates the attenuation of the immune function. The study highlights the complexity of factors driving DFTD progression and susceptibility, and that further studies are needed to better understand the factors driving the immune system of Tasmanian and hence DFTD epidemiology.

Acknowledgement: This work was supported by an Eric Guiler Tasmanian devil Research Grants through the Save the Tasmanian devil appeal of the University of Tasmania Foundation, an Australian Academy of Science, RSSC Early Career Fellowship, an International Associated Laboratory Project France/Australia, and a Deakin Faculty of Science Engineering & Built Environment Research Grant Scheme 2017 (SEBE-RGS17-07ARR). NR is supported by a Holsworth Wildlife Research Endowment.

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Transmissible cancers:
Are they rare, or do we just fail to recognise them?

Georgina Bramwell[1], Aaron Schultz[1], Craig Sherman[1], Marcel Klaassen[1], Rodrigo Hamede[1,2], Thomas Madsen[1], Frédéric Thomas[3], Beata Ujvari[1,2]

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Introduction

Disseminated neoplasia (DN) has been reported in the literature since the 1960's in 15 different species of bivalves all over the world[1] (Fig. 1). The group of bivalves that have been affected by DN are mussels, cockles, clams and oysters. In all species affected, DN presents as abnormally proliferating cells, particularly haemocytes[2]. A recent study in the USA found that DN has the capability of acting as a transmissible cancer[3]. Up until this discovery it was believed that transmissible cancers were rare and only affected two mammalian species (Tasmanian devils and dogs)[4] however the recent discovery raises the question, are transmissible cancers actually rare?

Analysing previous research on DN revealed that there are many differences between techniques and study design, indicating the possibility that evidence supporting transmissible cancer could have been missed (Figs 2-3). Based on reviewing the inconsistencies in the literature, here we propose a step-by-step guide to determine the presence/absence of transmissible cancers in bivalves.

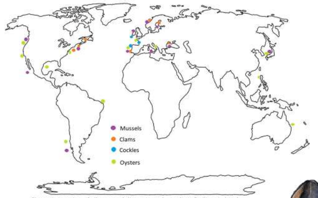

Figure 1. Location of all reported disseminated neoplasia findings in bivalves.

The Problem

Data collection

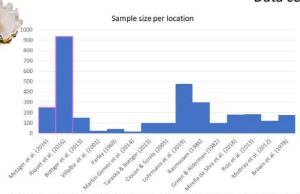

Figure 2. Sample sizes used in the 15 papers reporting the presence of disseminated neoplasia. Metzger et al. (2016) and Riquet et al. (2016) (the first two bars with purple outline) discovered DN being a transmissible cancer.

- Tissue type
  - Most use both haemolymph and solid tissue
  - Solid tissue ranges from the whole individual to the mantle, gill and stomach
  - Some only use haemolymph or a transverse section of all organs
- Sample location
  - Always mentions but not always exact
- Longitudinal samples
  - Varies between monthly, annually, randomly or only once

Diagnostic techniques

Figure 3. Different diagnostic techniques used or not used in 15 articles reporting DN.

Possible outcomes

- Phenotypic
  - One paper mention a size difference[6]
  - One paper mentions pale, watery tissue[20]
- Bivalve Health
  - Some mention of weakness[8] and increased mortality[7]

The Solution – Systematic/consistent data collection

Target key species → Collect samples → Analysis → Future directions

Target key species

Temperature range[21]
- Optimal = 20-24°C
- 40°C = 100% sarcoma cell death

Salinity levels[21]
- Low = 0.5‰ (100% sarcoma cell death)
- High = 35‰ (50% sarcoma cell death)

Cancer thrives in hypoxic environments
- 1-2% O^2 or below in tumours[22]
- Bivalves can switch to anaerobic oxygen production[23]

Transition route required
- filter feeders and spawning[24]

Collect samples

Sample size
- Total abundance of DN often below 10%[2]
- Min. 100 sample size per location

Appearance/size
- Measure initial weight and size
- Note any mantle recession /watery tissue/discolouration[2]

Tissue required for histology
- Both haemolymph and transverse section of all organs

DNA for analysis

RNA
- potential expression of neoplasia specific genes

Analysis

Histological analysis
- To determine neoplasia

Cloning
- To separate host/neoplasia sequences (Fig. 4)
- BLAST sequences
- If transmissible cancer, neoplasia sequence will match between individuals

Figure 4. Example trace image of extra genetic material within a sample.[3]

Need multiple genes – (without paralogues and NUMts)
- Possible genes include[3]: mtCOI, EF1α, rDNA ITS

Phylogenetic analysis
- To identify the lineage

PCR/gel screening
- To establish prevalence

Future directions

Revisit museum specimens
- University of Cambridge
  - Contains approx. 100,000 lots
- Queensland museum
  - Contains approx. 200 species

Metagenomic datasets
- https://jgi.doe.gov/

eDNA
- Study showed success to detect mussels using PCR and qPCR[25], sea stars using droplet PCR[26] (Fig. 5)

Transferability
- Potential artificial transfer experiment

Conclusion

- "Just like people often don't realize the benefits of vaccines when the disease becomes rare, evolutionary biologists may not recognize the critical role of transmissible cancers in shaping animal evolution as these cancers are very rare" [Prof James DeGregori].
- Transmissible cancers may not be as rare as originally thought as DN may actually be a transmissible cancer due to inconclusive/inconsistent research. A step-by-step guide can be a solution to detect transmissible cancers.
- If common, similar to other parasites and pathogens, transmissible cancers can/will have a major impact on host-parasite interactions, ecosystem function and animal evolution.

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The following links can provide advice on effective poster design:

- http://guides.nyu.edu/posters
- http://www.personal.psu.edu/drs18/postershow/
- https://www.behance.net/gallery/2284120/SCIENTIFIC-POSTER
- https://www.youtube.com/watch?v=AwMFhyH7_5g