OFFLU meeting
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Brighton, UK

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AI group update

H5 characterization concept

AIMS

- To understand the antigenic and genetic evolution and inter-relationships of currently circulating H5 clades of public and animal health importance
- To characterise and evaluate genetic changes of significance to both poultry vaccine efficacy and transmission risk for mammalian species?
- To quantitatively assess the potential risk of emerging strains both between poultry and into humans
- To feed timely analyses into key stakeholder organisations such as the poultry industry, vaccine manufacturers, OIE and WHO, 'OIE poultry vaccine strain selection panel'.

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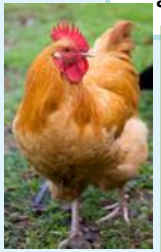
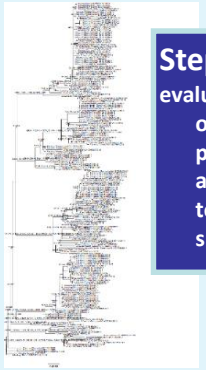
Avian Influenza – One Health Assessment

H5, H7 and H9 enhanced characterisation: next steps
Formalising a pipeline for risk assessment

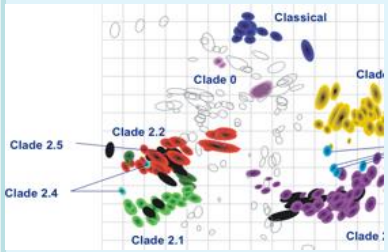
- Generate harmonised chicken and ferret serum panels
- HI assays with current H5 clade strains
- Antigenic cartography
- Whole genome sequencing
- integrated phylogenetic analyses



Step 1:
antigenic and genetic analyses of currently circulating H5 clades



Step 2:
evaluate antigenetic changes of significance to both poultry vaccine efficacy and the transmission risk to and within mammalian species



Step 3:
quantitatively assess the potential risk of emerging strains both between poultry and into humans

Influenzas of veterinary public health importance

Provide timely analyses to key stakeholder organisations:

Human Health Professionals
Competent Veterinary Authorities
Poultry industry,
Vaccine manufacturers,
National and international advisory and policy bodies,
OIE and WHO,
Inform pre-pandemic and poultry vaccine strain selection,
Risk assessment tools

APHA, SEPRL, OFFLU avian TA, CEIRS network

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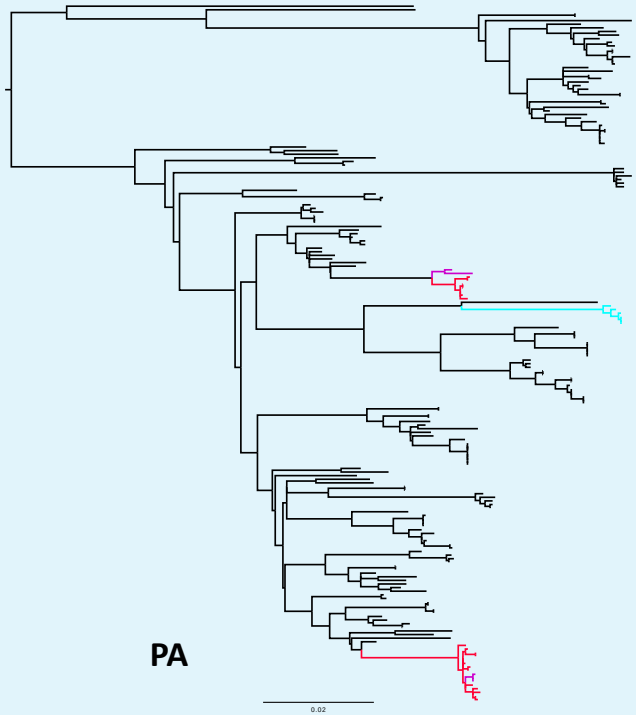
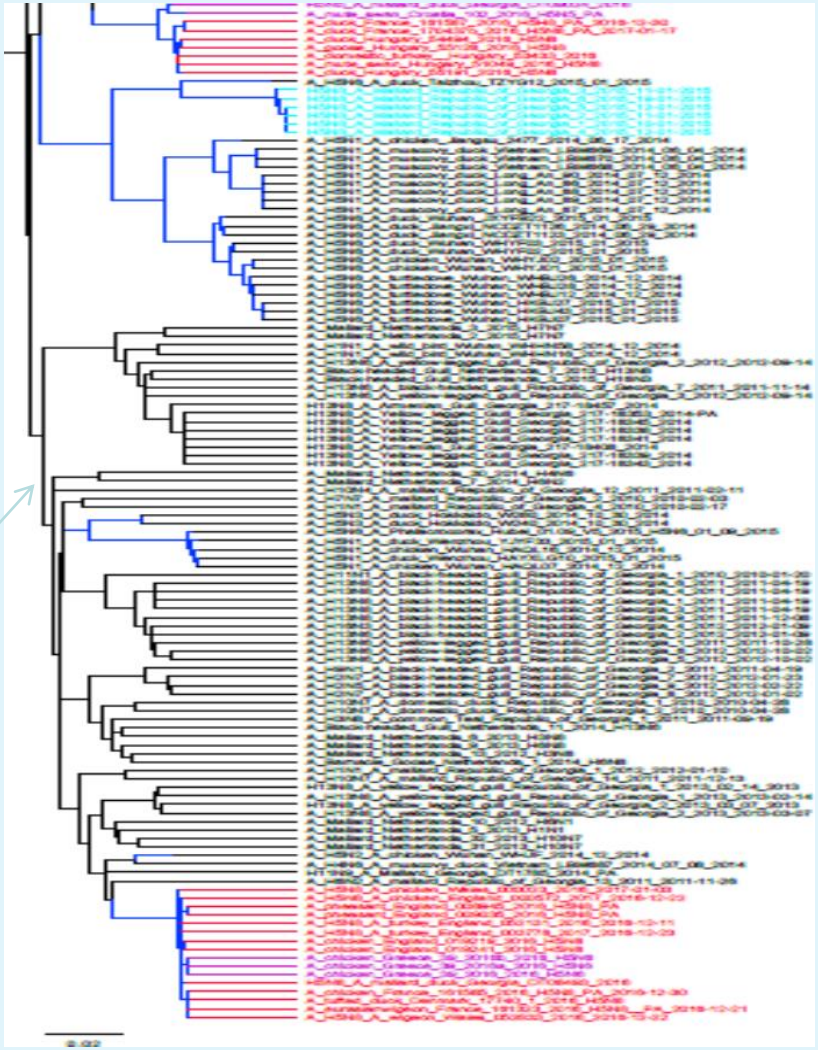
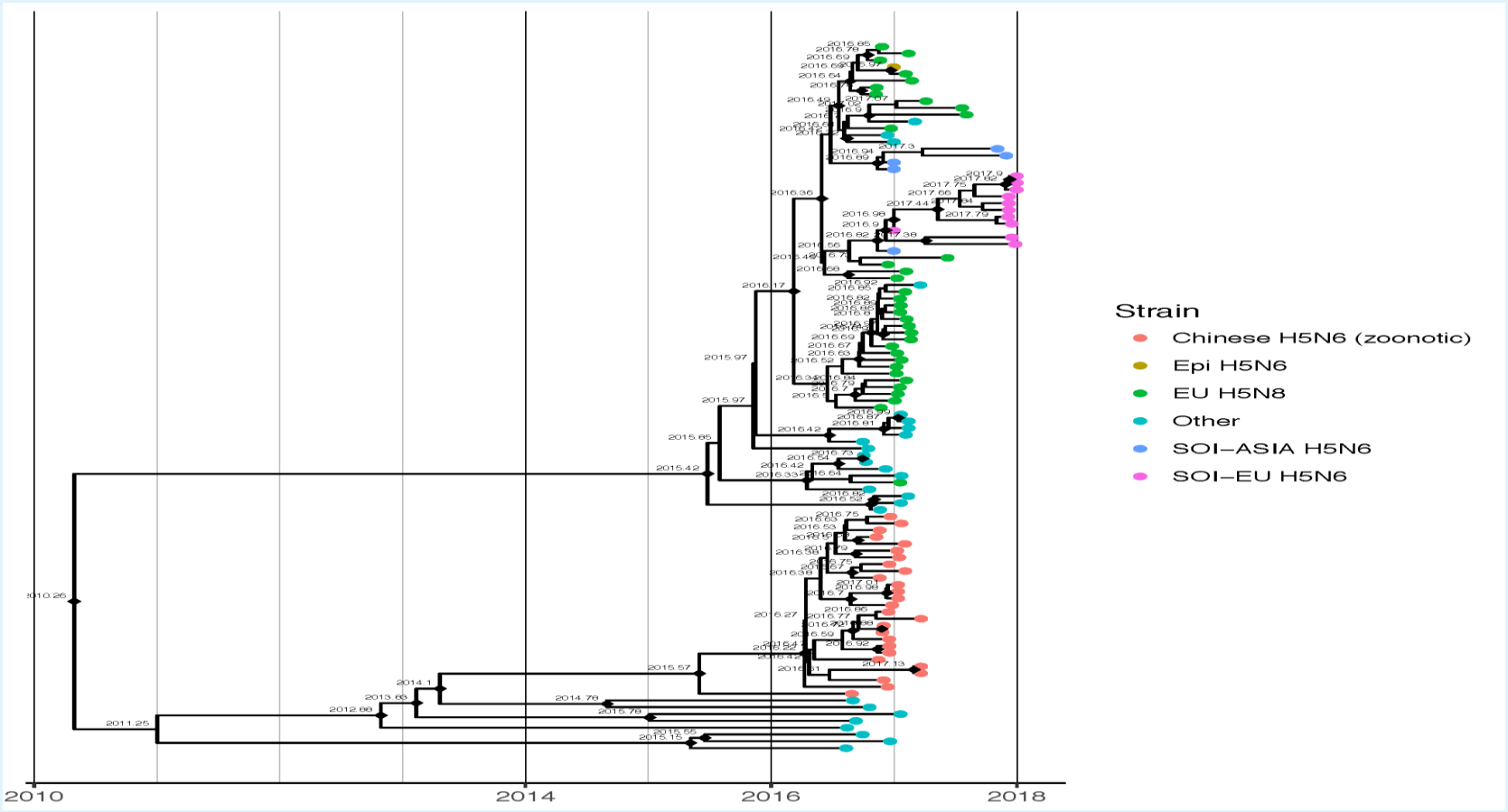
H5N8 genotypic variation: reassortment with LPAI in wild birds: all gene segments except MP and NS (17/18)

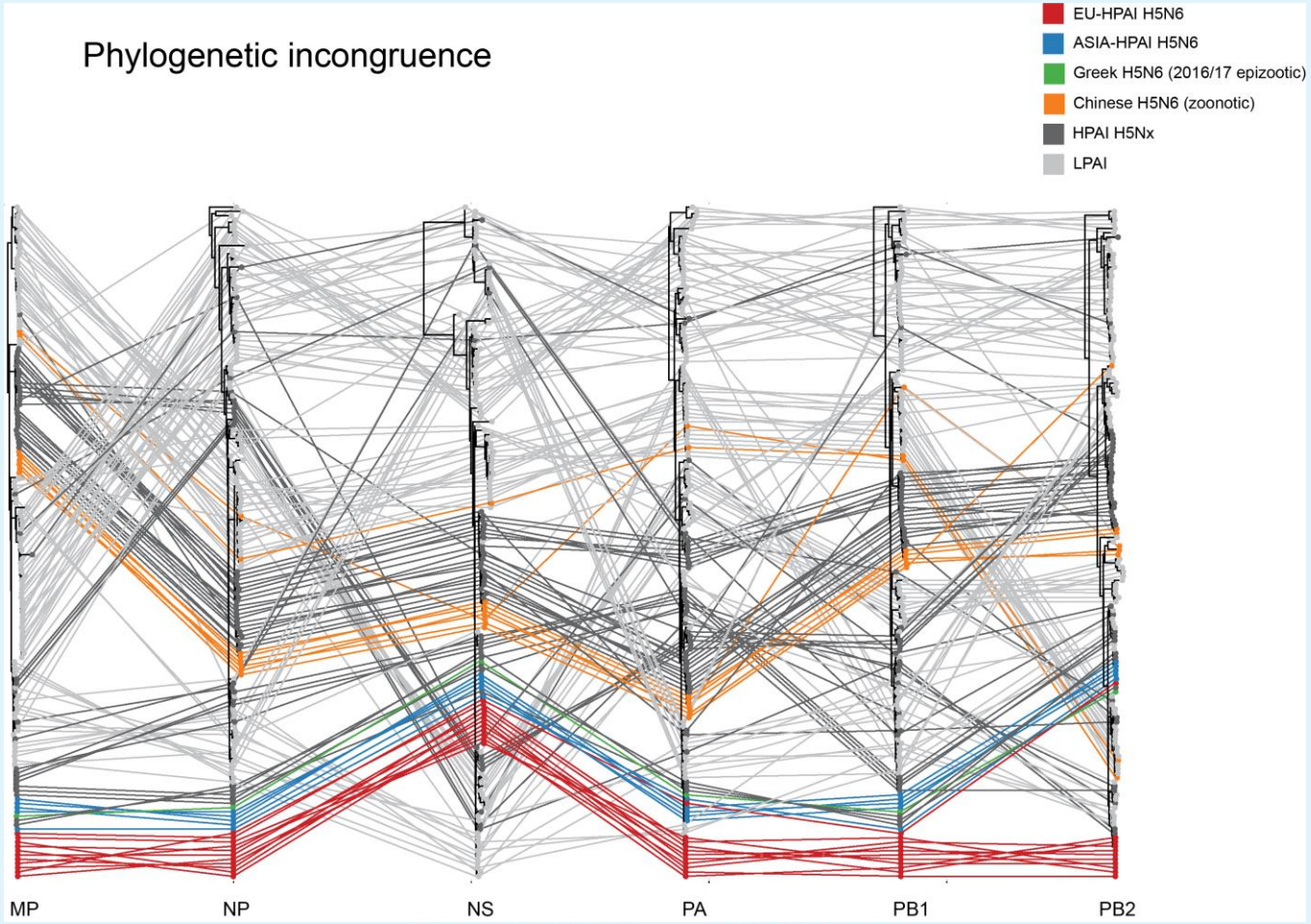




Molecular epidemiology of HA gene of H5N6



Incongruence analyses showing gene linkages for H5N6 HPAI



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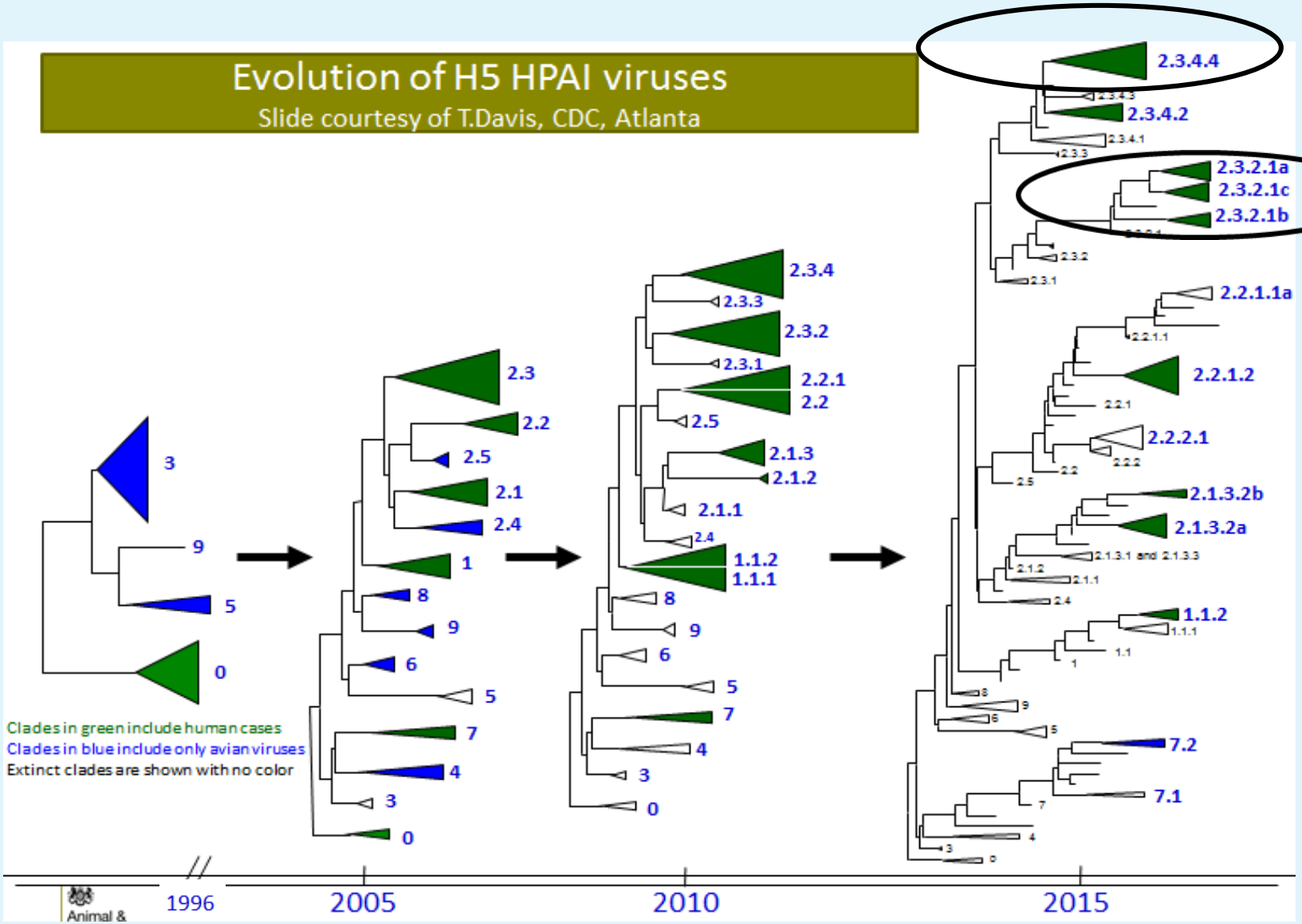
Evolution of H5 HPAI viruses

Slide courtesy of T.Davis, CDC, Atlanta



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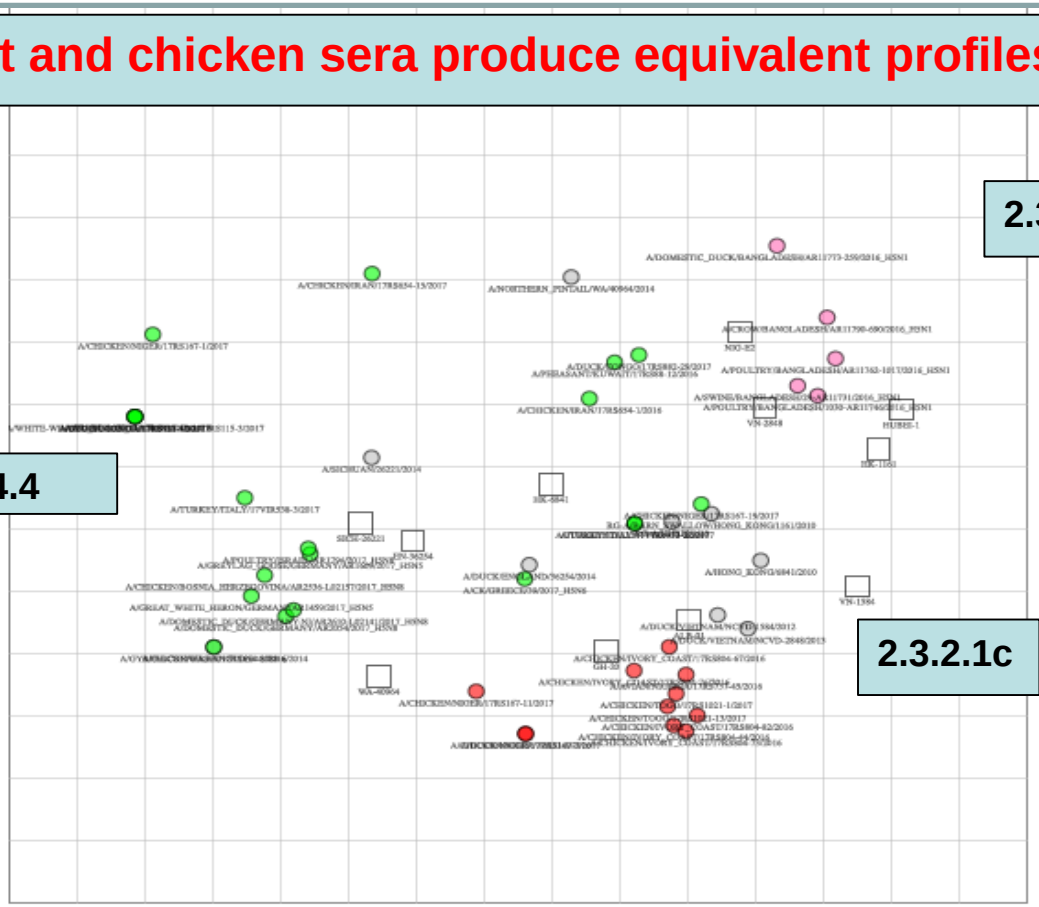
Mapping antigenic changes in H5 HPAI viruses

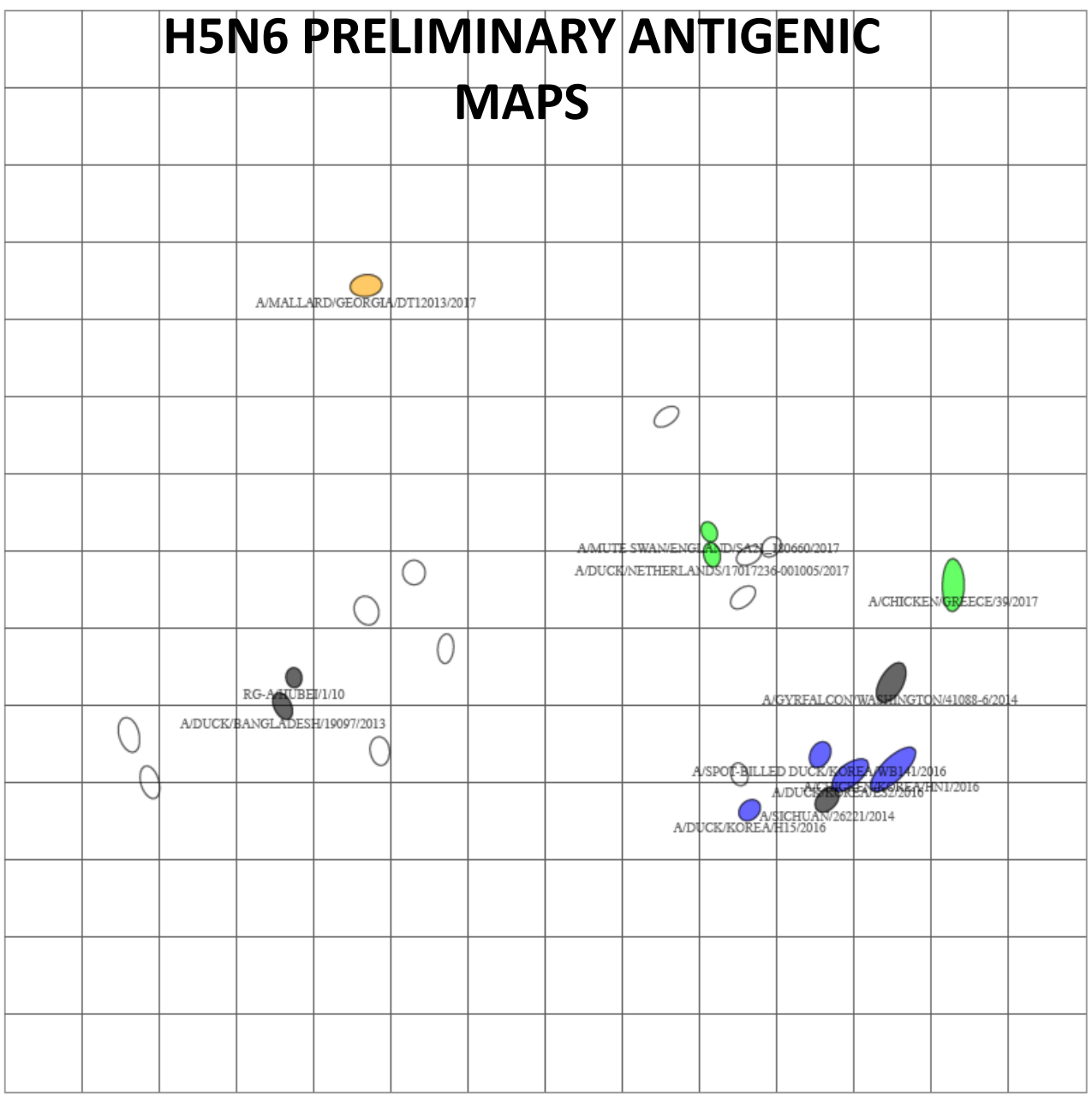
Ferret and chicken sera produce equivalent profiles



Antigenic map showing the OFFLU H5 HI assay data.
Strains are shown as colored circles, ferret reference antisera as gray squares.
Strain color by H5 clade: pink 2.3.2.1a,
red 2.3.2.1c
green 2.3.4.4
gray reference
One grid square represents one antigenic unit or a two-fold difference in HI assay titer

APHA-Weybridge;
IZSVe, Padova;
CSIRO, Geelong

H5N6 PRELIMINARY ANTIGENIC MAPS



APHA unpublished; Youn-Jeong, Lee et al APQA, Republic of Korea

Next steps

- Alignment of goals with VCM TA
- Define data gaps
- Produce relevant reagents
  - Sera
  - Antigens
- Develop maps –H5
  - include known poultry vaccine strain data

Thanks for your attention

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