

Close Genetic Relatedness between Human and Swine Hepatitis E Viruses in Hong Kong

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About Us

Introduction

- Hepatitis E virus (HEV) is increasingly recognized as one common foodborne cause of human viral hepatitis in developed countries
- Number of locally-acquired case was rising in the past decade in Hong Kong

Aim

To investigate genetic association between human HEV infection and HEV-contaminated high-risk food

	Pig liver	Pig intestine	Oyster	Pig blood curd	Lamb
N	488	245	489	244	244
HEV +ve	7	1	1	0	0
HEV +ve %	1.4%	0.4%	0.2%	0.0%	0.0%

Table 1. HEV prevalence of different food items

	2014												2015												2016		
	Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1					
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M			
Pig liver		1			1				1			1			1												
Pig intestine			1																								
Pig blood curd																											
Oyster		1																									
Lamb																											

Supermarket Wet market

Table 2. Temporal distribution of food samples tested positive for HEV RNA

Method

Human and Food Sample Collection

- Retrieval of Archived Serum from Patients Tested HEV IgM Positive from 2014 to 2016
- Food Sample (Lamb, Oyster, Pig Blood Curd, Pig Intestine and Pig Liver) Purchase from March 2014 to March 2016

RNA Extraction

(QIAamp Viral RNA Mini Kit)

HEV RNA Detection

(Broadly-reactive Real-time RT-qPCR Assay)

HEV Genotyping

(Nested PCR Targeting ORF1 and ORF2/3 of HEV Genome)

Sanger Sequencing

Neighbor-joining Phylogenetic Inference and Analysis
(MEGA 7)

Results

- HEV RNA was detected in 7 pig liver, 1 pig intestine and 1 oyster samples (Table 1 and 2)
- Four HEV strains from pig liver samples and 14 HEV strains from human sera were successfully genotyped
- All HEV strains belonged to **subtype 4b** except for 1 human and 1 swine strains that were grouped to **subtype 4d** (Figure 1)

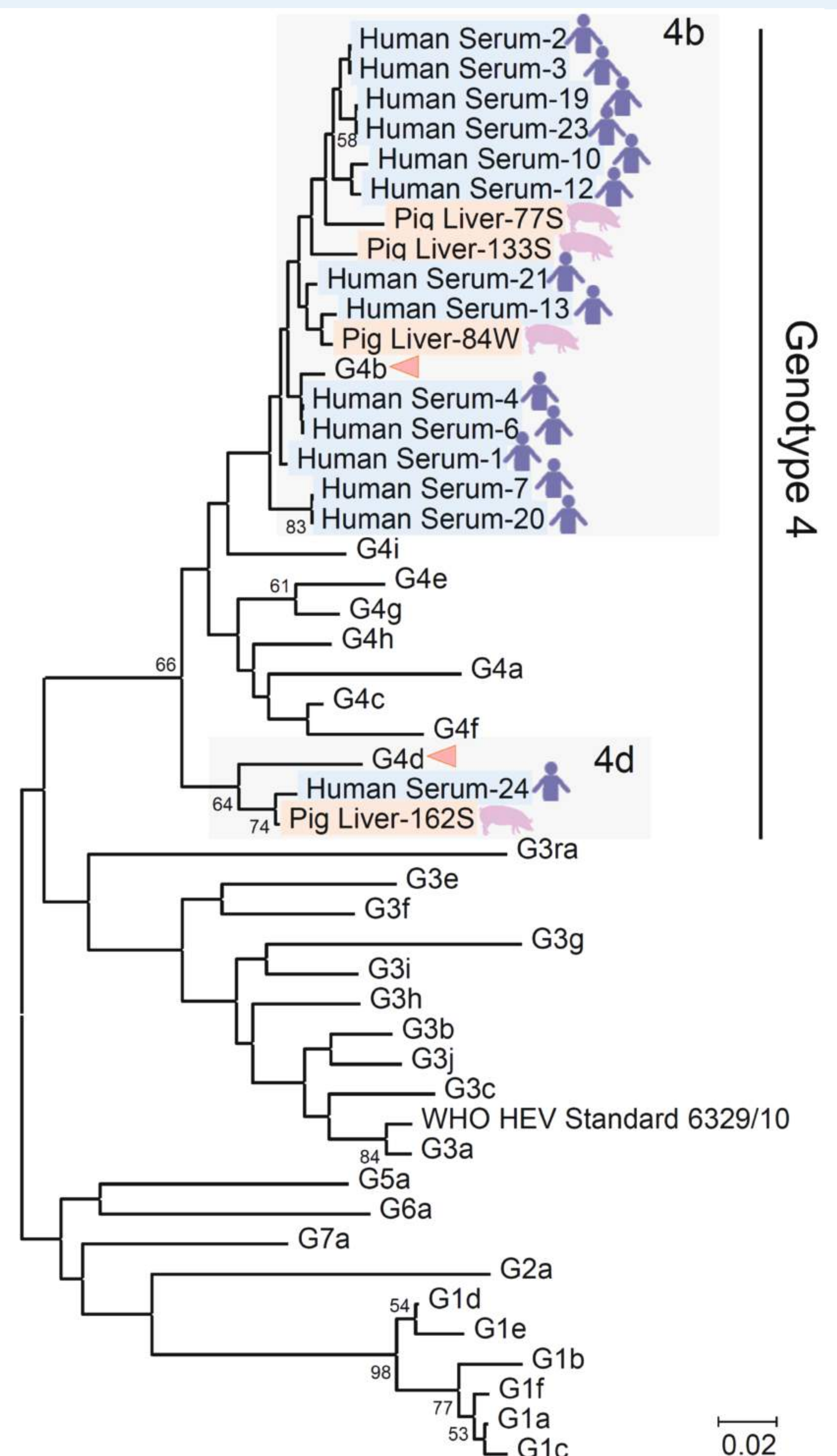


Figure 1. Neighbor-joining phylogenetic tree of human and swine HEV obtained in this study constructed using partial ORF1 sequences (133 nucleotides)

Conclusion

Our findings showed a **close genetic relatedness between human and swine HEV strains**, supporting that consumption of high-risk food items such as pig liver is the probable source of local human HEV infections.

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