

# 台灣分離之狂犬病病毒序列分析

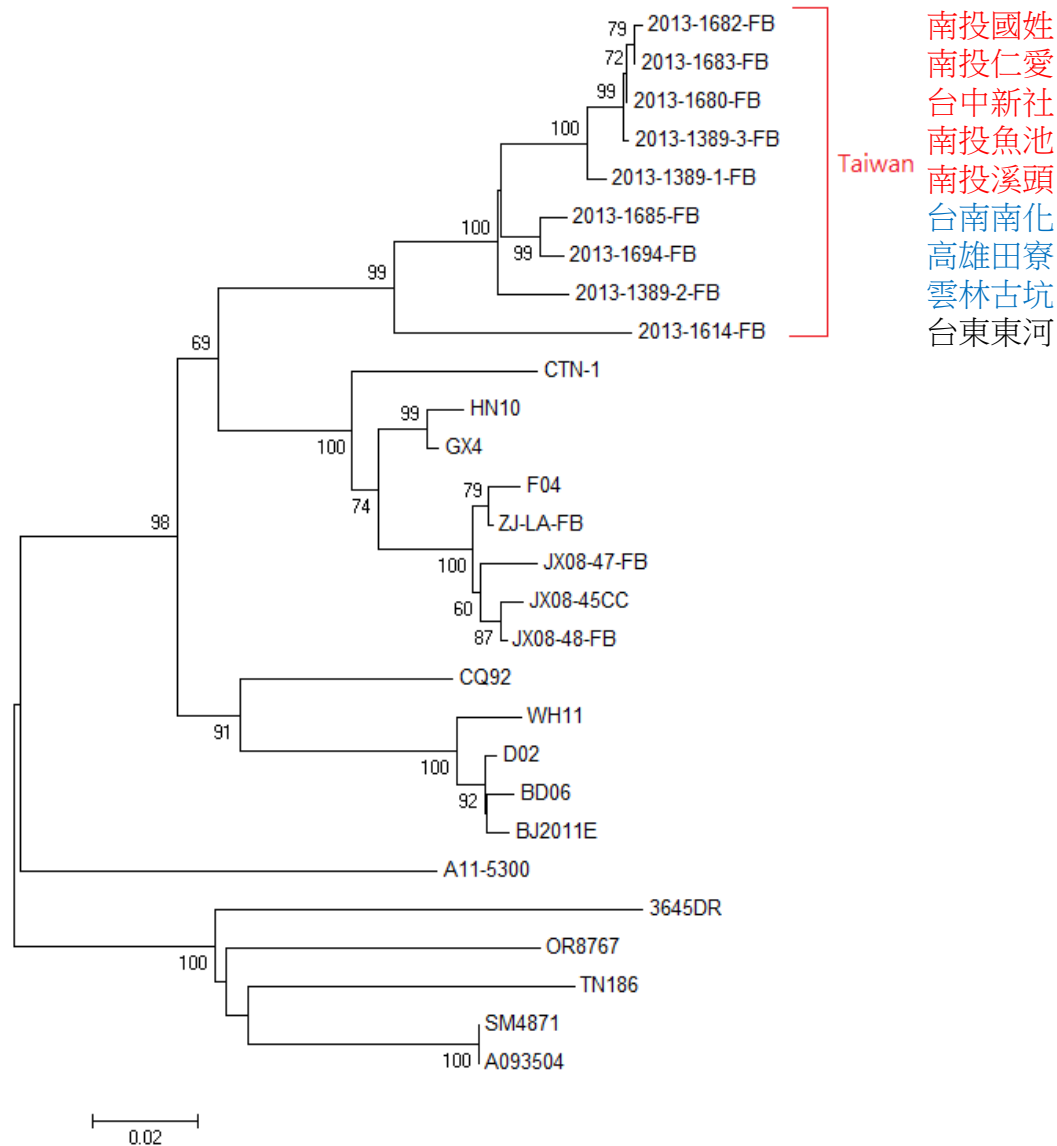
農委會家畜衛生試驗所

2013/8/5

# Analysis of glycoprotein (G) gene

2013/08/05

# Phylogenetic tree of G gene (768bp)



# Sequence distances of G gene (768bp)

		Percent Identity																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
Divergence	1	█	91.8	91.5	91.7	92.8	93.2	92.3	92.6	91.7	86.7	87.4	88.7	87.2	87.0	83.6	84.8	83.3	88.7	87.6	87.0	86.8	87.2	84.8	84.9	81.8	88.2	87.9	88.0	1	2013-1614-FB
	2	8.8	█	99.7	99.9	96.6	96.5	99.0	96.2	99.9	86.7	87.9	88.7	87.6	86.8	82.8	82.9	81.8	88.9	88.3	87.1	86.3	86.8	82.9	83.3	81.1	88.8	88.4	88.0	2	2013-1680-FB
	3	9.2	0.3	█	99.9	96.4	96.2	98.7	96.0	99.6	86.7	87.6	88.4	87.4	86.6	82.6	82.7	81.5	88.7	88.0	86.8	86.1	86.6	82.7	83.1	80.9	88.5	88.2	87.8	3	2013-1682-FB
	4	9.0	0.1	0.1	█	96.5	96.4	98.8	96.1	99.7	86.8	87.8	88.5	87.5	86.7	82.7	82.8	81.6	88.8	88.2	87.0	86.2	86.7	82.8	83.2	81.0	88.7	88.3	87.9	4	2013-1683-FB
	5	7.6	3.5	3.8	3.6	█	99.1	96.9	97.5	96.5	86.5	88.9	89.8	88.8	86.8	82.3	83.3	82.7	90.1	89.3	87.1	86.8	86.8	83.3	84.4	81.6	89.6	89.5	88.8	5	2013-1685-FB
	6	7.2	3.6	3.9	3.8	0.9	█	97.0	97.5	96.4	86.5	89.2	89.8	88.7	86.8	82.3	83.2	82.3	90.1	89.3	87.1	86.7	86.8	83.2	84.4	81.1	89.8	89.7	89.1	6	2013-1694-FB
	7	8.2	1.1	1.3	1.2	3.2	3.1	█	96.7	98.8	86.5	88.4	89.2	88.2	86.6	82.4	83.2	82.0	89.5	88.5	86.8	86.1	86.6	83.2	83.3	81.1	89.1	88.9	88.5	7	2013-1389-1-FB
	8	7.9	3.9	4.2	4.0	2.5	2.5	3.4	█	96.1	86.8	89.1	89.8	88.0	87.0	81.9	83.1	82.3	90.1	89.2	87.0	87.2	87.0	83.1	84.0	81.3	89.7	89.6	89.2	8	2013-1389-2-FB
	9	9.0	0.1	0.4	0.3	3.6	3.8	1.2	4.0	█	86.6	88.0	88.5	87.5	86.7	82.9	83.1	81.9	88.8	88.4	87.0	86.2	86.7	83.1	83.2	81.3	88.9	88.5	88.2	9	2013-1389-3-FB
	10	15.0	15.0	15.0	14.9	15.3	15.4	15.4	14.8	15.2	█	88.2	89.6	88.2	97.7	81.8	83.7	83.3	89.1	88.9	98.2	91.3	97.7	83.7	84.6	81.8	89.2	88.4	88.0	10	WH11
	11	14.2	13.5	13.9	13.7	12.2	11.9	12.9	12.1	13.4	13.2	█	95.6	93.6	88.4	82.3	84.2	82.9	96.1	98.4	88.4	89.1	87.9	84.2	84.9	81.6	98.8	99.5	98.0	11	JX08-45CC
	12	12.6	12.6	12.9	12.7	11.1	11.1	11.9	11.1	12.7	11.5	4.6	█	94.9	90.0	82.8	84.9	84.1	99.1	95.8	90.2	90.9	89.7	84.9	85.4	81.5	96.2	96.1	95.7	12	HN10
	13	14.4	13.9	14.2	14.0	12.4	12.6	13.2	13.4	14.0	13.2	6.8	5.3	█	88.0	82.9	84.9	84.0	95.3	93.9	88.3	89.2	87.8	84.9	85.3	82.4	94.0	93.9	93.2	13	CTN-1
	14	14.7	14.9	15.2	15.0	14.8	14.8	15.2	14.7	15.0	2.4	12.9	11.0	13.4	█	81.8	83.5	82.8	89.5	89.1	99.2	91.5	99.0	83.5	84.5	81.4	89.3	88.4	88.2	14	BD06
	15	18.9	20.0	20.4	20.2	20.8	20.8	20.6	21.3	19.8	21.5	21.2	20.2	19.9	21.5	█	90.4	88.2	82.8	82.8	82.2	83.9	82.2	90.4	83.3	86.5	83.3	82.7	82.6	15	TN186
	16	17.5	20.0	20.3	20.1	19.4	19.6	19.6	19.8	19.8	18.9	18.2	17.4	17.3	19.3	10.5	█	90.8	85.0	84.1	83.7	84.2	83.7	100.0	84.1	88.4	84.6	84.5	84.4	16	SM4871
	17	19.4	21.6	22.0	21.8	20.3	20.9	21.2	20.9	21.4	19.4	20.0	18.4	18.5	20.1	13.2	10.0	█	84.0	83.1	83.5	85.3	83.5	90.8	83.9	87.5	83.3	83.2	82.8	17	OR8767
	18	12.6	12.3	12.6	12.4	10.8	10.8	11.6	10.8	12.4	12.1	4.0	0.9	4.9	11.6	20.2	17.2	18.6	█	96.4	89.7	90.9	89.2	85.0	85.8	82.0	96.7	96.6	96.2	18	GX4
	19	13.9	13.1	13.4	13.2	11.7	11.8	12.7	11.9	12.9	12.2	1.6	4.3	6.5	12.1	20.7	18.4	19.8	3.8	█	89.3	89.7	88.8	84.1	85.0	81.9	99.3	98.4	97.8	19	F04
	20	14.7	14.5	14.9	14.7	14.5	14.5	14.9	14.7	14.7	1.9	12.9	10.7	13.0	0.8	21.0	18.9	19.2	11.3	11.8	█	92.1	99.2	83.7	84.5	82.0	89.6	88.7	88.4	20	D02
	21	14.9	15.6	16.0	15.8	14.9	15.1	16.0	14.4	15.8	9.5	12.1	10.0	12.0	9.2	19.2	18.3	16.8	10.0	11.3	8.6	█	91.5	84.2	87.1	82.0	90.0	89.6	89.2	21	CQ92
	22	14.2	14.7	15.1	14.9	14.7	14.7	15.1	14.5	14.9	2.3	13.4	11.2	13.5	0.9	20.8	18.8	19.0	11.8	12.3	0.7	9.0	█	83.7	84.8	82.0	89.1	88.2	87.9	22	BJ2011E
	23	17.5	20.0	20.3	20.1	19.4	19.6	19.6	19.8	19.8	18.9	18.2	17.4	17.3	19.3	10.5	0.0	10.0	17.2	18.4	18.9	18.3	18.8	█	84.1	88.4	84.6	84.5	84.4	23	A093504
	24	17.4	19.5	19.9	19.7	18.0	18.1	19.5	18.6	19.7	17.7	17.4	16.8	16.9	17.9	19.9	18.4	18.6	16.2	17.2	17.9	14.5	17.4	18.4	█	83.9	85.3	85.3	84.8	24	A11-5300
	25	21.6	22.6	23.0	22.8	21.9	22.6	22.6	22.5	22.4	21.7	21.9	22.2	20.8	22.3	15.4	12.9	14.0	21.4	21.5	21.3	21.4	21.2	12.9	18.7	█	82.3	81.9	81.5	25	3645DR
	26	13.2	12.4	12.7	12.6	11.4	11.1	12.1	11.3	12.3	11.9	1.2	3.9	6.3	11.8	19.9	17.7	19.4	3.4	0.7	11.4	11.0	11.9	17.7	16.9	21.0	█	99.1	98.4	26	ZJ-LA-FB
	27	13.6	12.9	13.2	13.1	11.6	11.3	12.3	11.4	12.7	12.9	0.5	4.0	6.5	12.9	20.8	17.9	19.6	3.5	1.6	12.6	11.5	13.1	17.9	16.9	21.5	0.9	█	98.6	27	JX08-48-FB
	28	13.4	13.4	13.7	13.6	12.4	12.1	12.8	11.9	13.2	13.4	2.0	4.5	7.2	13.2	21.1	18.1	20.2	3.9	2.3	12.9	12.0	13.4	18.1	17.6	22.1	1.6	1.5	█	28	JX08-47-FB
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			

台東東河  
台中新社  
南投國姓  
南投仁愛  
台南南化  
高雄田寮  
南投溪頭  
雲林古坑  
南投魚池

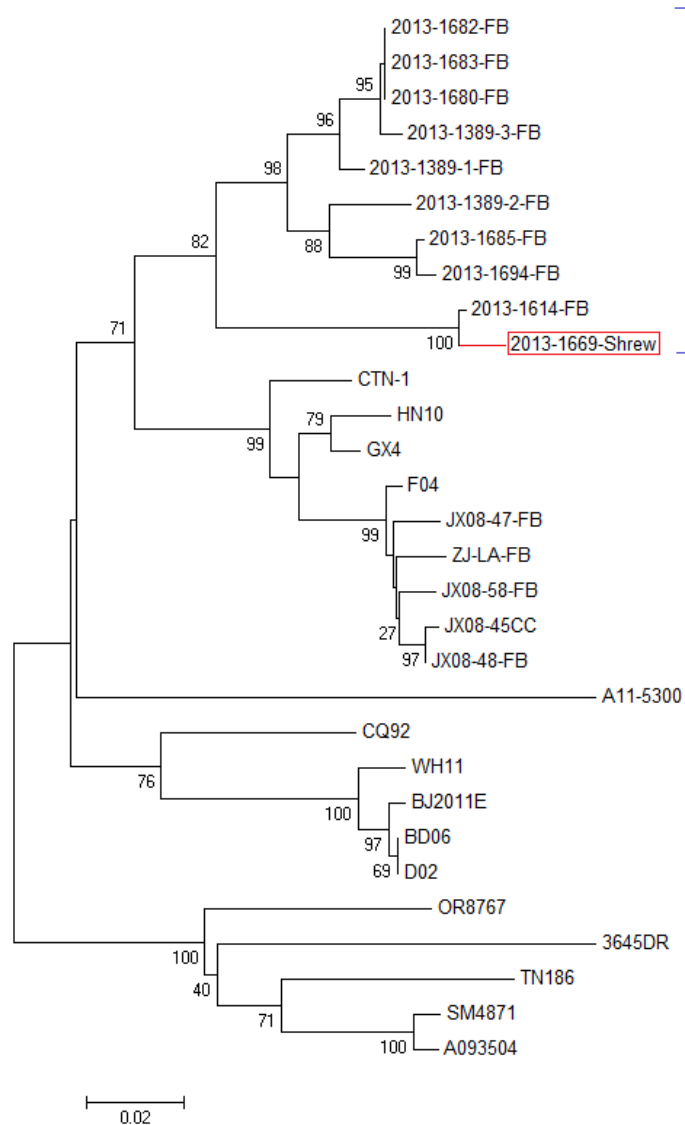
# 醣蛋白基因核酸序列相似性

- G gene 以 768bp 比對結果顯示 2012~2013 年台灣鼬獾分離株相似度介於91.5~99.9%
- G gene 以 768bp 比對結果顯示 2012~2013 年台灣鼬獾分離株與中國大陸分離株相似度介於87.8~89.6%

# Analysis of nucleoprotein (N) gene

2013/08/05

# Phylogenetic tree of N gene (389bp)



Taiwan

南投國姓  
南投仁愛  
台中新社  
南投魚池  
南投溪頭  
雲林古坑  
台南南化  
高雄田寮  
台東東河  
台東錢鼠

# Sequence distances of N gene (389bp)

		Percent Identity																																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
Divergence	1	█	92.0	92.0	92.0	92.0	91.5	99.0	92.0	91.5	92.0	87.7	87.4	89.7	90.2	87.9	83.0	82.3	83.3	90.0	88.7	87.9	89.5	87.7	81.7	85.3	80.7	88.2	88.2	87.7	87.7	1	2013-1614-FB	台東東河
	2	8.6	█	100.0	100.0	95.6	95.6	91.5	98.5	95.6	99.5	87.4	90.0	91.0	90.7	87.7	83.3	84.3	84.6	91.3	91.3	87.7	88.4	87.4	84.3	83.8	81.7	89.7	90.7	90.2	90.2	2	2013-1680-FB	台中新社
	3	8.6	0.0	█	100.0	95.6	95.6	91.5	98.5	95.6	99.5	87.4	90.0	91.0	90.7	87.7	83.3	84.3	84.6	91.3	91.3	87.7	88.4	87.4	84.3	83.8	81.7	89.7	90.7	90.2	90.2	3	2013-1682-FB	南投國姓
	4	8.6	0.0	0.0	█	95.6	95.6	91.5	98.5	95.6	99.5	87.4	90.0	91.0	90.7	87.7	83.3	84.3	84.6	91.3	91.3	87.7	88.4	87.4	84.3	83.8	81.7	89.7	90.7	90.2	90.2	4	2013-1683-FB	南投仁愛
	5	8.6	4.6	4.6	4.6	█	99.5	91.0	95.6	96.4	95.6	86.6	88.7	91.3	89.5	86.9	83.5	84.6	83.3	91.0	90.0	86.9	88.7	86.6	84.6	85.1	81.0	89.5	88.9	88.9	89.5	5	2013-1685-FB	台南南化
	6	9.2	4.6	4.6	4.6	0.5	█	90.5	95.6	96.4	95.6	86.6	88.2	90.7	89.5	86.9	83.8	84.6	83.5	90.5	89.5	86.9	88.2	86.6	84.6	84.8	81.2	88.9	88.9	88.4	88.9	6	2013-1694-FB	高雄田寮
	7	1.0	9.2	9.2	9.2	9.8	10.4	█	91.5	90.5	91.5	86.6	86.9	89.2	89.2	86.9	82.8	82.3	83.3	89.5	88.2	86.9	88.4	86.6	81.7	84.8	80.7	87.1	87.7	87.1	87.1	7	2013-1669-Shrew	台東錢鼠
	8	8.6	1.6	1.6	1.6	4.6	4.6	9.2	█	95.6	98.5	87.4	90.5	91.5	90.7	87.7	83.3	85.3	84.6	91.8	91.3	87.7	88.9	87.4	85.3	84.6	82.3	90.2	91.3	90.7	90.7	8	2013-1389-1-FB	南投溪頭
	9	9.2	4.6	4.6	4.6	3.7	3.7	10.4	4.6	█	95.6	87.1	88.9	90.2	90.7	87.9	83.8	84.6	84.3	90.7	90.2	87.9	88.4	87.7	85.1	84.6	82.5	89.2	90.2	89.2	89.2	9	2013-1389-2-FB	雲林古坑
	10	8.6	0.5	0.5	0.5	4.6	4.6	9.2	1.6	4.6	█	87.4	89.5	90.5	90.2	87.7	83.3	84.3	84.6	90.7	90.7	87.7	88.4	87.4	84.3	83.8	81.7	89.2	90.2	89.7	89.7	10	2013-1389-3-FB	南投魚池
	11	13.9	14.2	14.2	14.2	15.3	15.2	15.1	14.2	14.5	14.2	█	86.4	89.5	89.5	98.2	84.6	85.6	85.3	89.2	87.7	98.2	91.5	98.2	85.3	86.4	84.8	87.7	87.4	86.6	87.1	11	WH11	
	12	14.2	11.0	11.0	11.0	12.6	13.2	14.8	10.4	12.2	11.6	15.6	█	95.1	94.9	86.4	83.3	84.3	84.8	95.9	98.7	86.4	87.7	86.4	84.8	83.8	83.3	98.2	98.5	99.7	98.2	12	JX08-45CC	
	13	11.3	9.8	9.8	9.8	9.5	10.1	11.9	9.2	10.7	10.4	11.7	5.1	█	95.1	88.9	84.3	86.9	86.1	98.2	95.9	88.9	88.7	88.9	86.9	86.6	84.1	95.4	95.6	95.4	95.9	13	HN10	
	14	10.7	10.1	10.1	10.1	11.6	11.6	11.9	10.1	10.0	10.7	11.7	5.4	5.1	█	89.2	84.8	85.9	85.9	96.4	96.1	89.2	90.0	89.2	86.4	85.9	84.1	95.1	95.4	95.1	95.1	14	CTN-1	
	15	13.5	13.9	13.9	13.9	14.9	14.9	14.8	13.9	13.5	13.9	1.8	15.6	12.4	12.0	█	84.8	85.9	85.9	89.2	87.7	100.0	92.3	99.5	85.9	85.3	85.1	87.7	87.4	86.6	87.1	15	BD06	
	16	19.9	19.4	19.4	19.4	19.1	18.7	20.2	19.4	18.7	19.4	17.8	19.4	18.1	17.3	17.4	█	92.8	90.5	83.5	84.1	84.8	85.3	85.1	92.3	81.5	87.7	82.5	83.3	83.0	83.5	16	TN186	
	17	20.8	18.0	18.0	18.0	17.6	17.6	20.8	16.6	17.6	18.0	16.3	18.0	14.7	15.9	16.0	7.7	█	91.3	85.6	85.6	85.9	85.6	86.1	99.0	82.0	90.0	84.1	84.8	84.6	85.1	17	SM4871	
	18	19.4	17.7	17.7	17.7	19.4	19.0	19.4	17.7	17.9	17.7	16.7	17.3	15.6	15.9	16.0	10.4	9.5	█	85.3	86.1	85.9	86.4	85.9	90.7	82.8	88.9	85.1	85.3	85.1	85.6	18	OR8767	
	19	11.0	9.5	9.5	9.5	9.8	10.4	11.6	8.9	10.1	10.1	12.0	4.3	1.8	3.7	12.0	19.1	16.3	16.7	█	96.7	89.2	88.9	89.2	86.1	85.9	84.3	96.1	95.9	96.1	96.1	19	GX4	
	20	12.6	9.5	9.5	9.5	11.0	11.7	13.2	9.5	10.7	10.1	14.0	1.3	4.3	4.0	14.0	18.4	16.3	15.6	3.5	█	87.7	88.9	87.7	86.1	84.8	83.8	98.5	98.7	99.0	98.5	20	F04	
	21	13.5	13.9	13.9	13.9	14.9	14.9	14.8	13.9	13.5	13.9	1.8	15.6	12.4	12.0	0.0	17.4	16.0	16.0	12.0	14.0	█	92.3	99.5	85.9	85.3	85.1	87.7	87.4	86.6	87.1	21	D02	
	22	11.6	12.9	12.9	12.9	12.6	13.2	12.8	12.3	12.9	12.9	9.2	13.9	12.6	11.0	8.3	16.7	16.4	15.4	12.3	12.3	8.3	█	91.8	85.1	84.3	81.7	88.4	87.7	87.9	88.4	22	CQ92	
	23	13.9	14.2	14.2	14.2	15.3	15.2	15.1	14.2	13.8	14.2	1.8	15.6	12.4	12.0	0.5	17.1	15.7	16.0	12.0	14.0	0.5	8.9	█	86.1	85.3	84.8	87.7	87.4	86.6	87.1	23	BJ2011E	
	24	21.6	18.0	18.0	18.0	17.7	17.6	21.6	16.6	16.9	18.0	16.7	17.4	14.7	15.3	16.0	8.3	1.0	10.1	15.7	15.7	16.0	17.1	15.6	█	81.7	89.7	84.6	85.3	85.1	85.6	24	A093504	
	25	16.8	19.0	19.0	19.0	17.2	17.5	17.5	17.9	17.9	19.0	15.5	19.0	15.2	16.1	16.9	22.0	21.2	20.2	16.2	17.6	16.9	18.3	16.9	21.7	█	80.7	85.1	84.3	84.1	84.1	25	A11-5300	
	26	23.0	21.5	21.5	21.5	22.7	22.2	23.0	20.8	20.3	21.5	17.7	20.5	18.7	19.0	17.4	14.6	11.4	12.7	18.4	19.4	17.4	22.2	17.7	11.7	23.2	█	83.0	83.8	83.5	84.1	26	3645DR	
	27	13.3	11.4	11.4	11.4	11.7	12.3	14.5	10.7	11.9	12.0	14.0	1.8	4.9	5.1	14.0	20.6	18.4	17.0	4.0	1.6	14.0	12.9	14.0	17.8	17.3	20.9	█	98.2	98.5	97.9	27	ZJ-LA-FB	
	28	13.3	10.1	10.1	10.1	12.4	12.3	13.9	9.5	10.7	10.8	14.3	1.6	4.6	4.8	14.3	19.4	17.4	16.6	4.3	1.3	14.3	13.9	14.3	16.7	18.4	19.8	1.8	█	98.7	98.2	28	JX08-58-FB	
	29	13.9	10.7	10.7	10.7	12.3	12.9	14.5	10.1	11.9	11.3	15.3	0.3	4.8	5.1	15.3	19.8	17.7	16.9	4.0	1.0	15.3	13.5	15.3	17.0	18.6	20.1	1.6	1.3	█	98.5	29	JX08-48-FB	
	30	13.9	10.7	10.7	10.7	11.7	12.3	14.5	10.1	11.9	11.3	14.7	1.8	4.3	5.1	14.7	19.1	17.0	16.3	4.0	1.6	14.7	12.9	14.7	16.3	18.7	19.4	2.1	1.8	1.6	█	30	JX08-47-FB	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				



# 核蛋白基因核酸序列相似性

- N gene 以 389bp 比對結果顯示 2012~2013 年台灣鼬獾分離株相似度介於91.5~100%
- N gene 以 389bp 比對結果顯示 2012~2013 年台灣鼬獾分離株與中國大陸分離株相似度介於87.7~91.3%
- N gene 以 389bp 比對結果顯示錢鼠與 2012~2013 年台灣鼬獾分離株相似度介於90.5~99%
- N gene 以 389bp 比對結果顯示錢鼠與 2012~2013 年中國鼬獾分離株相似度介於87.1~87.7%

- 以目前在台灣所分離的狂犬病病毒（Rabies, RBV）之糖蛋白及核蛋白核酸序列分析結果顯示，流行於台灣鼬獾之狂犬病病毒依地理區域的差異性可以區分為3個族群，分別為（1）台中、南投。（2）雲林、台南、高雄。（3）台東。其中台東鼬獾及錢鼠RBV屬同一個族群，但是這3個RBV族群均屬於Lyssavirus第一基因型的狂犬病病毒，並且與中國大陸之RBV最為相似。