(2004U004 研究発表)

Data collection on
Infectious Bronchitis Virus Nucleocapsid Protein
NW12 December 16, 2004
Hui Fan, Amy Ooi, Sifang Wang, Dingxiang Liu & Julien Lescar
with the NW12 team and Prof Wakatsuki

Infectious Bronchitis Coronavirus (IBV) belongs to the same Coronaviridae family as the SARS virus (Marra et al, 2003) and thus represent an emerging potentially life threatening viral agent. The N protein is a basic, phosphorylated viral structural protein of 409 residues highly conserved among IBV strains (Williams et al., 1992). Previous studies have demonstrated that IBV N protein interacts specifically with genome RNA sequences of the virus RNA and co-assembles with the genomic RNA into nucleocapsids which are incorporated in the mature virion.

Thanks to the MAD data collected on a Seleomethyomylated protein crystal at the PF, we solved the crystal structure of the N-terminal domain RNA binding domain of the N protein. The structure is currently being refined to 1.9 Å resolution using in-house data. The crystal structure of the N-terminal domain will contribute to the understanding of protein-RNA interaction and virus assembly and hopefully assist the design of inhibitors of viral assembly. Data collection statistics at NW12 are summarized in Table 1.

	N14C	Semet peak	SeMet inflection	SeMet remote
Wavelength (Å)	1.5418	0.97943	0.97956	0.98729
Cell parameters (Å), $P2_1$	*a*=35.48 *b*=35.72 *c*=56.11 α=99.05 β=93.93 γ=109.53	*a*=34.77 *b*=35.37 *c*=55.95 α=100.51 β=95.48 γ=110.16		
Resolution range (Å)	20-1.85	20-1.95		
No. of reflections (Observed/unique)	75,798 / 20,031	76,265 / 20,083	64,999 / 17,032	
Completeness (%)[a]	92.4 /(88.8)	96.6 (95.0)	96.5 (95.2)	
Multiplicity[b]	3.8 (3.7)	3.8 (3.7)	3.8 (3.6)	
R_{merge}[c]	0.064 (0.625)	0.05 (0.118)	0.05 (0.131)	
I/σ(I)	7.4 (1.1)	8.6 (3.7)	8.3 (4.4)	
Solvent content (%)	43.35	40.56		
No of Se sites	-	6	-	-
Phasing power[e]	-	0.7/0.6	0.6/0.4	0.2/1.1
f ’ / f ” [f]	-	-8.5 / 3.8	-8.3/3.5	-1.21/3.11
Figure of merit [g] 20-2.5 Å	-	0.61/0.793		

References

Marra, M A., *et al.* (2003). The genome Sequence of SARS –Associated Coronavirus. *Science*. 300, 1399-1403.

Williams, A. *et al.* (1992). Comparative analysis of the nucleocapsid genes of several strains of infectious bronchitis virus and other coronaviruses. *Virus Res*. 25, 213-212.